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Genesis, Tectonic Setting- and Exploration Considerations for Fe-oxide Cu Au Deposits, Mount Isa Eastern Succession

Thesis Submitted by
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For the degree of Doctor of Philosophy
In the School of Earth Scienecs
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ABSTRACT

Based on the geochemistry of mafic rocks, the Palaeo-Mesoproterozoic eastern margins of the North and South Australian Cratons can be classified into the Eastern Domain (Mount Isa Eastern Succession, Curnamona Province and Georgetown Inlier) and Western Domain (Mount Isa Western Succession, Kalkadoon-Leichhardt Belt and McArthur River Basin). Basaltic magmatism of the Eastern Domain was synchronous with back arc basinal development, while Western Domain magmas were emplaced into a thicker continental crust. This difference is reflected in the metallogenic nature of the domains, whereby Fe-oxide-Cu-Au (IOCG) and Broken Hill Type (BHT-type) deposits dominates the Eastern Domain, and stratiform Pb-Zn-Ag and Mount Isa Style Cu-Pb-Zn(Ag) are found in the Western Domain. Based on the distinct evolutionary trends for mafic magmas of the domains of Mesoproterozoic Australia, we suggest that the Mount Isa Western Succession and McArthur River Basin continue to be recognised as part of the North Australian Craton. While the Mount Isa Eastern Succession, Curnamona Province and the Georgetown Inlier be referred to as the East Australian Craton. An actively or formerly subducted slab sitting in the mantle lithosphere to the east of the eastern margin of the East Australian Craton may have provided the appropriate mantle chemistry to contribute to subsequent generation, in an extended continent, of magmas and volcano-sedimentary input that led to the formation of Mesoproterozoic IOCG and BHT deposits.

In the Mount Isa Eastern Succession, mafic rocks and magmas contributed sulphur and metals to IOCG ore deposition over a protracted (~170My) period. Between 1686 Ma and 1660Ma, S and metals (Cu, Au, Zn, Fe, Ni, Co) were exsolved

from crystallising strongly fractioned back-arc tholeiitic magmas into active extensional faults, and surrounding country rocks. During Isan peak-metamorphism, at ~1600Ma-1580Ma, significant amounts of S, Cu, Au, Zn, Ni, Co and Cr were leached from mafic rocks and crustal accumulations, and led to the deposition of early IOCG and base metal deposits. Subsequent albitic alteration associated with the hydrothermal fluids of the ~1550Ma-1490Ma Williams-Naraku Batholith may also have sequestered sulphide material from mafic rocks. This study highlights the possibility that the previously held consensus that the Williams-Naraku Batholith of felsic-intermediate magmas contributed the bulk of the metals to the Eastern Succession mineral deposits, may not necessarily be the case, but rather, fluids derived from these magmas remobilised previously existing mafic derived metal accumulations.

Protracted metal and sulphur contributions to the Mount Isa Eastern Succession Iron oxide-Cu-Au (IOCG) province occurred primarily as a consequence of long-lived fluid and melt fluxes from the base of the crust, stimulated by initial back-arc emplacement of voluminous mafic magmas. The concentration of sulphur, iron, copper and gold into the presently observed mineral deposits involved a significant component of remobilisation and reworking of early initial enrichments (pre- to syn-Isan Orogeny) by later fluids (syn- to post-Isan and syn-Williams/Naraku Batholith). Osborne (eastern domain) and Eloise-type ores formed or were strongly remobilized at c. 1600 Ma by reduced, mafic-derived fluids, whereas oxidised brines released by the Williams/Naraku granitoids overprinted magnetite ± sulphides at Osborne (western domain) and Starra to produce younger (c. 1530 Ma) hematite-chalcopyrite associations. CO2-rich, potentially mantle-derived fluid may have periodically pulsed through the system, manifest now as pyrrhotite-stable carbonate veins and pods. Exploration for Ernest Henry and Starra style deposits should focus on recognition of oxidised corridors in relation to mafic- proximal and structurally-defined targets, However, the possibility remains that large, early mafic rock related Cu-Au ± (Fe, Co, Ni, Zn) deposits are preserved distal to the oxidising effects of the Williams-Naraku hydrothermal system, and may also present exploration opportunities.

Within the southern portion of the Mount Isa Eastern Succession, mafic rocks, and faults that intersect areas of mafic rocks, exhibit the strongest spatial relationship to IOCG mineralisation than any other geological unit. In contrast, felsic rocks, of which both genetic and exploration models have relied heavily upon in the past in order to explain the final localisation controls on IOCG deposits, do not display a significant relationship to mineralisation. The results attained call for an immediate review of exploration practices in the Eastern Succession, and call upon more mafic-related models in order to achieve sustainable IOCG mineral discoveries.

CONTENTS

STATEMENT OF SOURCES

Declaration

I declare that this thesis is my own work and has not been submitted in any form for another degree or diploma at any university or other institution of tertiary education. Information dervided from the published or unpublished work of others has been acknowledged in the text and a list of references is given.

15 June 2010

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Kris Butera Date

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Thanks Fiona, the 7 kids and my family for all your love and support over the last few years.

PREFACE

This thesis has been written as concisely as possible in order to fulfil its objective as an industry "friendly" document, with the specific purpose of helping explorers discover unidentified Fe-oxide Cu Au mineral resources, under the philosophies and logic of the predictive mineral discovery cooperative research centre (pmd*CRC).

The thesis is written as four exclusive papers/articles with the intention of publication in relevant journals/newsletters, and as such, there may be some repetition of crucial topics from paper to paper. Each paper has been contributed to by one or more co-authors.

The papers, in individual chapters, form a logical geological progression from beginning to end:

Chapter 1:
Back-arcs, mafic rock geochemistry, metallogenesis and a reinterpretation of the Paleo- to Mesoproterozoic assembly of Northern and Eastern Australia.
Butera, K.M., Oliver, N.H.S., Foster, D.R.W., Rubenach, M.J.R., Collins, W.C. and Nortje, G.S.

This chapter sets the tectonic framework for the metallogenic studies contained further in the thesis. The geochemistry of the mafic rocks units from within the Mount Isa Inlier and surrounding Proterozoic domains was studied in order to explain the distribution of different metallogenic styles that are temporally and spatially associated with those domains.

Chapter 2:
The role of mafic rocks in the genesis of Iron oxide-Copper-Gold deposits, Mount Isa Eastern Succession, Northwest Queensland.
Butera, K.M., Oliver, N.H.S., Cleverley, J.S., Rubenach, M.J. and Collins, W.C.

Chapter 2 examines the geochemical relationships between Fe-oxide Cu Au (IOCG) deposits and mafic rocks and magmas in the Mount Isa Eastern Succession. Topics studied and discussed include both primary (fractionation) and secondary (metamorphic leaching) processes enacted upon mafic rocks/magmas that led to IOCG genesis.

Chapter 3:
A protracted multi-staged model for Fe oxide-Cu-Au mineralisation, Mount Isa Eastern Succession, NW Queensland.
Butera, K.M., Oliver, N.H.S. and Nortje, G.S.

Chapter 3 takes the data and interpretations from Chapter 2 and puts them in a broader context for overall IOCG Genesis models in the Mount Isa Eastern Succession, discussing previous models and highlighting the need to incorporate the new data into current genetic and exploration models for IOCGs. A reworked version of this paper was published in Precambrian Research, with a siginificant component of the work being contributed by Nick Oliver. This reworked paper is included in Appendix III for comparsion, outlining the various authors contributions.

Chapter 4:

Spatial Associations of mafic rocks and Fe-oxide Cu-Au deposits, southern Mount Isa Eastern Succession: implications for exploration

Butera, K.M. and Oliver, N.H.S.

This chapter examines the spatial association of geological units to IOCG deposits, and specifically the strength of the spatial relationship of mafic rocks to IOCGs. Utilising Weights of Evidence and Fractal Analysis, this work provides exploration indicators/strategies for IOCG deposits, and with the previous discussed geochemical relationships of mafics to IOCGs, adds a set of tools and greater confidence for mineral explorers to engage in IOCG mineral discovery.

CHAPTER 1

Back-arcs, mafic rock geochemistry, metallogenesis and a reinterpretation of the Paleo- to Mesoproterozoic assembly of Northern and Eastern Australia.

Back-arcs, mafic rock geochemistry, metallogenesis and a reinterpretation of the Paleo- to Mesoproterozoic assembly of Northern and Eastern Australia.

Butera, K.M.[1*], Oliver, N.H.S. [1], Foster, D.R.W. [1], Rubenach, M.J.R. [1], Collins, W.C. [1] and Nortje, G.S.[1]

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Abstract

This work presents the Mesoproterozoic evolution of the eastern margins of the North and South Australian Cratons. Using the geochemistry of mafic magmas and their tectonic emplacement environments the cratons can be classified into the Eastern Domain (Mount Isa Eastern Succession, Curnamona Province and Georgetown Inlier) and Western Domain (Mount Isa Western Succession, Kalkadoon-Leichhardt Belt and McArthur River Basin). Basaltic magmatism of the Eastern Domain was synchronous with back arc basinal development, while Western Domain magmas were emplaced into a thicker continental crust. This difference is reflected in the metallogenic nature of the domains, whereby Fe-oxide-Cu-Au (IOCG) and Broken Hill Type (BHT-type) deposits dominates the Eastern Domain, and stratiform Pb-Zn-Ag and Mount Isa Style Cu-Pb-Zn(Ag) are found in the Western Domain. Based on the distinct evolutionary trends for mafic magmas of the domains of Mesoproterozoic Australia, we suggest that the Mount Isa Western Succession and McArthur River Basin continue to be recognised as part of the North Australian Craton. While the Mount Isa Eastern

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Succession, Curnamona Province and the Georgetown Inlier be referred to as the East Australian Craton. An actively or formerly subducted slab sitting in the mantle lithosphere to the east of the eastern margin of the East Australian Craton may have provided the appropriate mantle chemistry to contribute to subsequent generation, in an extended continent, of magmas and volcano-sedimentary input that led to the formation of Mesoproterozoic IOCG and BHT deposits.

Keywords: Mount Isa, Proterozoic, Back-arcs, Metallogenesis, Curnamona, Georgetown

Introduction

Mesoproterozoic geological provinces of Australia are very well endowed with mineral deposits. Despite recognition of some commonality of tectono-stratigraphic evolution of these different terrains (Fig. 1), previous tectonic reconstructions do not adequately explain the paradoxical distribution of the different types of mineral deposits contained within them.

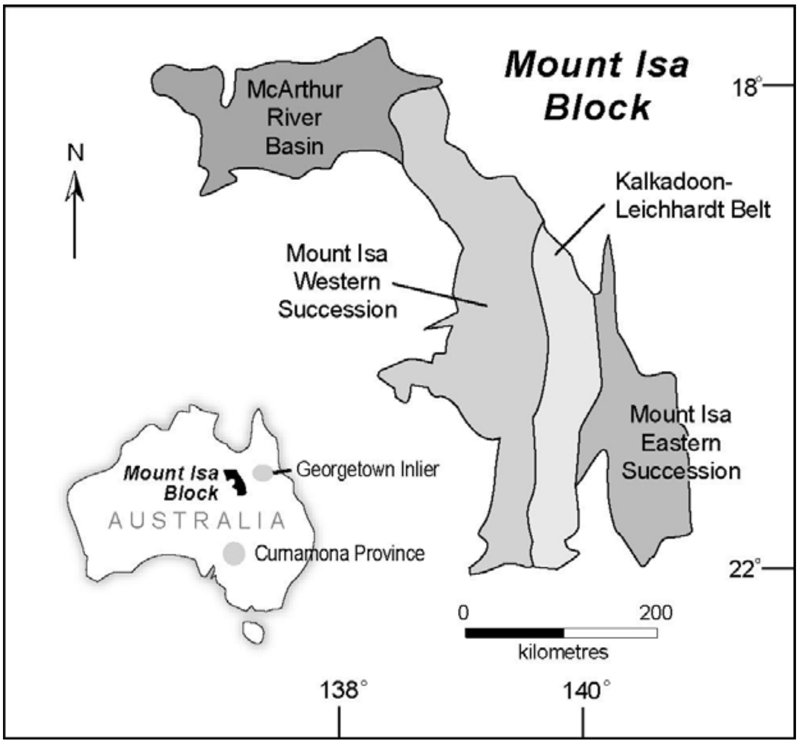

Figure 1. Map of the N-S trending successions of the Mount Isa Block, Australia (after Blake (1987); Blake and Stewart (1992); O'Dea et al. (1997).

Globally, the Proterozoic was a significant era in the geological history of the Earth. Karlstrom et al. (1999; 2001) suggested a globally significant Proterozoic orogenic system that extended from Australia, across southern Laurentia, to Baltica. This reconstruction proposed the possible connection of the south-western United States portion of western Laurentia with the southern edge of the North Australian craton (AUSWUS). It explains similar metamorphic and tectonic histories in the Cheyenne Belt of Laurentia, and the North Australian craton (1.7 to 1.55 Ga), where crustal thickening followed by decompression and two near-orthogonal shortening events have recently been recognized (Dalziel, 1992; Williams and Karlstrom, 1996; Ilg and Karlstrom, 2000; Karlstrom et al., 2001; Cihan, 2004; Sayab, 2005).

Myers et al. (1996) first divided the Proterozoic Australian continent into three possibly distinct cratons (North, South and West), based on the amalgamation of late Archaean to Paleoproterozoic blocks between 1.95Ga and 1.83Ga. Pb and Nd isotopic data from mineral deposits and rocks of the eastern margins of the North and South Australian craton show a similar isotopic pattern to those of south western Laurentia (Mojave province). The isotopic data suggest much more juvenile material on the eastern margin of the Mesoproterozoic Australian continent, analogous in age to rocks and mineral deposits of south western Laurentia, with older crust to the west (Wooden and DeWitt, 1991; Wooden et al., 1994; Zhao and McCulloch, 1995; Hawkins et al., 1996; Ramo and Calzia, 1998; Karlstrom and Williams, 1998; Karlstrom et al., 2001; Mark et al., 2005a; Foster and Austin, 2005).

Numerous researchers have refined the tectono-metamorphic and stratigraphic frameworks of the Australian cratons (Wilson, 1978; Laing and Beardsmore, 1986; Laing, 1990; Laing, 1996; McDonald et al., 1997; O'Dea et al. 1997; Scott et al., 2000; Betts et al., 2002; Giles et al., 2004). Previous work suggests that the crustal sequences of Australian cratons share a depositional history of episodic intracontinental rifting between *ca.* 1800 and *ca.* 1610Ma (Beardsmore et al., 1988; Page et al., 1997; Page, 1998; Page and Sun, 1998). Toward the eastern margin of the North Australian Craton, along with the Georgetown Inlier, is the metallogenically enriched Mount Isa Inlier (Fig. 1), divided into three north-south trending fold belts: the Western Succession, the central older exposed basement Kalkadoon-Leichhardt Belt, and the Eastern Succession, (Blake, 1987; Blake and Stewart, 1992; O'Dea et al., 1997; MacCready et al., 1998). The Broken Hill-Olary domains (Curnamona Province) lie on the eastern margin of the South Australian craton (Myers et al., 1996).

Scott et al. (2000) and Giles et al. (2002) suggested that the 1.8Ga to 1.6Ga extensional basins of the North Australian craton formed in response to far-field subduction in the Arunta inlier in central Australia. Scott et al (2000) made a number of interpretations for the nature and source of mafic magmas in the Mount Isa Western Succession and McArthur River Basin. They concluded that although the chemistries of these magmas were typical of continental flood basalts, they were not derived from plume-, rift- or direct arc-related processes, but rather, were generated by a long-lived convection cell coupled to distant subduction events in the Arunta Inlier, melting the lithospheric mantle. Both the long-lived nature of the magmatism (225 m.y.), and the low concentrations of Ti, P and Nb in the mafic rocks was thought to be inconsistent with decompression melting of a plume head. Most recently, Giles et al (2004) concluded that the North and South Australian Cratons were a single entity prior to ca. 1.50Ga. In their reconstruction the Curnamona Province was thought to be aligned with the Mount Isa-Georgetown depositional basins between 1.80Ga and 1.50Ga Ma, They postulated that the two cratons were separated at ca. 1.50Ga, then subsequently rejoined during the 1.33-1.10Ga Albany-Fraser and Musgrave orogenies.

The geochemistry of tholeiitic intrusive and basaltic mafic rocks gives an insight into the nature of the underlying mantle to these crustal blocks, which in turn helps to constrain fundamental geodynamic, tectonic and deep metal source region controls for the varying mineralisation types. The geochemistry of mafic rocks has been widely used to infer the tectonic environments in which the magmas were emplaced (Pearce and Cann, 1973; Pearce and Norry, 1979; Meschede, 1986), although common geochemistry may potentially be achieved in a number of environments (e.g. Cox, 1992). A number of researchers studying the nature of basic magmatism in the Mount Isa Block have failed to reach a consensus on the tectonic/geochemical connections. Glikson et al (1976) and Glikson and Derrick (1978) concluded that the magmas of the Western Succession of the Mount Isa Inlier were compositionally typical of continental tholeiites, whereas those of the Soldiers Cap Group of the Eastern Succession were similar to ocean floor basalts or arc basalts. Wilson (1978) postulated that the tholeiitic lavas of the region are geochemicaly similar to post Cretaceous? basalts formed in a mature continental margin setting in the western United States. Bultitude and Wyborn (1982) and Ellis and Wyborn (1984) suggested that the geochemistry of the mafic magmas (and dolerites) of the Mount Isa Inlier is consistent with continental rifting, but interpreted the change in chemistry from west to east as reflecting the depth of the mafic melt source region. The geochemical differences between the mafic rocks of the Western and Eastern Successions of the Mount Isa Inlier is thus variably interpreted as having either fundamental plate tectonic significance (Glikson and Derrick, 1978; Wilson, 1978) or a subdued significance within an overall intraplate rift environment (Ellis and Wyborn, 1984). Very little work has since occurred that compares Western and Eastern Succession mafic rock geochemistry.

Within the previously defined parts of the North Australian craton, there is an irregular distribution of mineral deposit types between the internal domains. The Mount Isa Western Succession and McArthur Basin are typified by shale-hosted Mount Isa-style Pb-Zn-Cu-(Ag) and stratiform Pb-Zn-Ag deposits, whereas the Eastern Succession and Broken Hill-Olary Domains of the Curnamona Province contain IOCG, Cu-only and Broken Hill-Type Ag-Pb-Zn mineralization. In order to explain these metal distributions and rationalise some of the problems of previous tectonic reconstructions, we utilise the geochemistry of mafic rocks and new age data to reinterpret the distribution of Proterozoic Australian cratons and blocks. Our new model explains key aspects of the regional metal zonation, particularly in the Mt Isa context, and defines new tectonic and metallogenic interpretations that impact on global reconstructions at this time.

Data

Wholerock XRF and ICP_MS analyses for Major, Trace and REE were obtained for this study on mafic rocks of the Mount Isa Eastern Succession, sampled distal to known mineralisation and alteration. The new geochemistry supplements existing wholerock geochemical data for the Eastern Succession, Western Succession, Kalkadoon-Leichhardt Belt, Curnamona Province and Georgetown Inlier, sourced from previous published and unpublished research (see below), and Geoscience Australia's Ozchem database (www.ga.gov.au). Newly obtained data of rocks that had obviously been influenced by alteration were discarded: results were rejected if they did not have SiO_2 between 46 and 52 wt %, Na_2O < 3.5 wt % and K_2O < 2 wt %. Na and K are mobile elements known to affect rocks during regional metamorphism and/or hydrothermal alteration in the Mount Isa Eastern Succession (Oliver et al, 2004). For previously published data (consisting of datasets rather than data averages) only samples with MgO between 4 and 8 wt% were considered, in addition to the aforementioned filtering mechanisms, to minimise the effect of crystal fractionation on HFSE ratios, and to provide the best point of comparison for different datasets. For the broader Mount Isa Block, data for the Eastern Succession, the Calvert and Leichhardt Associations of the Western Succession, Kalkadoon-Leichhardt Belt, and McArthur River Basin were gathered from Ellis and Wyborn (1984) and Scott et al (2000). Slaughter Yard Creek Dolerites (Western Succession) were drawn from Sisois-Pizanias (2001). Global geochemical data for continental flood basalts and back arc basinal basalts was collected from the online GEOROC database (http://georoc.mpch-mainz.gwdg.de/georoc/).

Geochronological data was taken from Geoscience Australia's Ozchron database, and from previously published work (Nutman and Ehlers, 1988; Black et al, 1998; Page and Sun, 1998; Scott et al, 2000; Connor and Fanning, 2001; Raetz et al, 2002). Age data for 1686±6Ma mafic rocks (gabbros and dolerites) from Snake Creek Anticline is from Rubenach (2005).

Mount Isa Eastern Succession

The oldest mafic rocks exposed in the Eastern Succession are those of the Marraba Volcanics and the 1740 Ma Lunch Creek Gabbro (Page 1983). The age of the Marraba Volcanics can be constrained to ca. 1760 Ma as it overlies Argylla Formation felsic volcanics erupted at ca. 1762 Ma and is in turn overlain by the Mitakoodi Quartzite deposited at ca. 1755 Ma (Page, 1998). These magmas may have been related to the ~1760Ma - 1740Ma Wonga extensional event, in which voluminous bimodal magmatism occurred in the Wonga Belt and broader Mary Kathleen Fold Belt on the western margin of the Eastern Succession (Holcombe et al, 1991; Oliver et al, 1991; Pearson et al., 1992).

The next major mafic magmatic event is constrained by a U-Pb SHRIMP zircon age of 1686±8 Ma for tonalite from the Snake Creek Anticline, toward the eastern margin of the Eastern Succession (Rubenach, 2005). Tonalite sheets, lenses and small bodies are abundant within the mafic-tonalite complex, a sill-like body that intruded near the top of the Llewellyn Creek Formation. The tonalites generally preserve igneous textures, whereas the mafic rocks, which include massive gabbro, layered gabbro and dolerite, have been largely converted to hornblende-plagioclase amphibolites, locally preserving igneous textures but are commonly foliated. Mingling/mixing relationships between tonalite and gabbro indicate coeval emplacement, so that the above age is the likely age of intrusion of the mafic rocks and a minimum age for the Llewellyn Creek Formation. SHRIMP zircon ages of 1658±8 and 1654±4 Ma have been determined for the Toole Creek Volcanics and Mt Norna Quartzite respectively, of the Soldiers Cap Group (Page & Sun, 1998). Both these units overly the Llewellyn Creek Formation, implying that there is a significant, previously unrecognised depositional hiatus between them. Significantly, the typical turbidite sedimentary structures in the Llewellyn Creek Formation are not seen in the overlying units.

Ages similar to the Toole Creek Volcanics are apparent also for the nearby Ernest Henry Diorite (1660 ±13Ma, 1658 ±10Ma, 1657±7Ma; Pollard and McNaughton, 1997; Page and Sun, 1998), and an albitized granite near Cloncurry (1679±7 Ma; Pollard & McNaughton, 1997) is similar to the age of the c. 1686 tonalites at Snake Creek. All indicate significant igneous activity during deposition of the Soldiers Cap Formation, probably in discrete events. The bulk of the remaining mafic units in the south and eastern parts of the Eastern Succession also appear to be related to either the 1686Ma or 1660Ma magmatic events. Dolerite sills from the Hampden Synform, for example, show similar folding patterns to those in the Snake Creek Anticline, suggesting that they were emplaced prior to an inferred N-S shortening event associated with regional albitisation at ~1640Ma (Rubenach, 2005). These mafic rocks, and similarly, those that have a spatial relationship to economically significant mineral deposits at Osborne (IOCG), Selwyn-Starra (IOCG), Eloise (IOCG), Mount Elliot (IOCG-skarn), Cannington (BHT), Pegmont and

Marramungee (BHT-skarn), also display a strong geochemical relationship to the 1686Ma generation of magmas (Butera et al, 2005; see below).

Other, volumetrically insignificant mafic magmatic episodes within the Eastern Succession are interpreted to have occurred at ~1600-1580Ma and ~1530Ma. The 1600-1580Ma generation of mafic rocks are present as thin dolerite dykes, generally less than 100m in width, and lie parallel to the axial plane of the Snake Creek Anticline. The syn- peak metamorphic timing is suggested by a) their orientation, b) lack of boudinage, c) they postdate earlier, folded mafic sills (and/or metabasalts), and d) they commonly preserve their igneous texture and some of their primary mineralogy (although partly foliated and amphibolitised along margins).

The ~1530Ma magmas are unfoliated gabbroic bodies that are mostly confined to west of the Cloncurry Fault, and are intimately associated (mixed and mingled) with granitoids of the ~1530-1500Ma Williams-Naraku Batholith (Page and Sun, 1998; Wyborn et al, 1998; Perring et al., 2001; Pollard et al., 1998; Mark et al, 2005b; Rubenach, 2005).

Averaged geochemical data for the 1686Ma, 1660Ma (Toole Creek Volcanics), ~1600Ma and ~1530Ma generations of mafic magmas are presented in Table 1. They all display strong Fe enrichment, similar to the high Fe tholeiites of the Curnamona Province. Correlation of iron enrichment with silica increase has been suggested to indicate a primary igneous fractionation trend (Williams, 1998; Butera et al, 2005)

	1686Ma		1660Ma (TCV)		1600Ma		1530Ma	
# samples	7		6		13		4	
	Average	*st. dev.*	*Average*	*st. dev.*	*Average*	*st. dev.*	*Average*	*st. dev.*
SiO2	48.32	1.07	49.13	1.39	49.23	0.79	47.38	0.45
TiO2	1.26	0.33	1.19	0.54	1.31	0.24	1.52	0.50
Al2O3	14.59	1.40	13.75	0.90	14.07	0.47	14.28	1.38
Fe2O3T	14.77	3.12	12.85	2.07	14.06	1.15	15.05	3.10
MnO	0.23	0.05	0.21	0.07	0.21	0.04	0.18	0.04
MgO	6.98	1.33	7.25	1.31	6.88	0.51	6.68	1.47
CaO	10.58	1.62	11.39	2.43	10.35	0.66	9.19	0.78
Na2O	2.36	0.64	2.17	0.83	2.61	0.31	2.93	0.62
K2O	0.47	0.21	0.26	0.16	0.95	0.41	1.55	0.49
P2O5	0.10	0.03	0.09	0.06	0.12	0.02	0.10	0.03
Sc	43.71	4.23	50.67	6.12	42.23	3.42	40.25	9.18
Ba	64.57	44.91	63.83	56.03	141.46	109.41	122.25	21.17
V	372.86	100.30	350.17	97.37	319.85	48.73	410.75	168.50
Cr	166.83	87.07	181.67	73.96	106.92	33.01	101.67	51.48
Co	53.14	7.40	49.50	3.27	57.00	10.64	61.75	3.86
Ni	100.71	24.01	77.33	16.95	87.69	17.27	108.50	49.80
Zn	81.43	20.41	98.33	36.43	74.31	30.51	55.75	32.94
Ga	19.14	2.34	17.33	2.58	19.92	1.12	20.00	2.83
Pb	28.29	4.75	17.67	6.25	28.62	3.52	27.00	4.97
Rb	27.20	18.09	9.00	9.42	66.00	40.57	81.75	41.68
Sr	134.43	41.10	154.00	62.74	146.85	27.17	162.00	13.83
Y	26.14	8.13	22.33	9.61	26.38	2.87	24.50	6.40
Zr	61.57	17.24	70.50	37.09	78.54	11.80	70.25	25.86
Nb	3.86	1.21	4.67	2.66	5.69	1.32	5.00	1.41
Se	4.78	7.34	-	-	13.25	7.16	11.85	10.80
Cd	5.57	1.84	-	-	3.03	2.75	2.23	2.63
Sn	1.23	0.52	-	-	1.33	1.07	1.95	1.53
Sb	0.86	0.49	-	-	0.46	0.26	0.73	0.36
Cs	0.54	0.74	7.00	-	0.54	0.40	1.21	1.25
La	4.33	1.12	6.80	3.03	6.87	1.61	7.38	3.06
Ce	11.03	2.77	14.33	8.41	16.06	3.74	17.09	6.23
Pr	2.78	1.45	7.00		1.79	0.97	2.62	2.57
Nd	9.77	2.37	11.00	6.44	12.32	2.26	12.92	3.29
Sm	3.11	0.98	-	-	3.56	0.98	3.98	0.78
Eu	0.99	0.06	-	-	1.30	0.35	1.44	0.43
Gd	3.99	1.39	-	-	4.46	0.74	4.52	1.03
Tb	1.07	0.60	-	-	0.54	0.29	0.73	0.64
Dy	4.87	1.38	-	-	5.02	0.80	5.36	1.35
Ho	1.46	0.87	-	-	0.69	0.41	0.94	0.89
Er	2.86	0.95	-	-	3.04	0.57	3.48	1.50
Tm	0.63	0.38	-	-	0.30	0.17	0.40	0.36
Yb	2.71	0.78	-	-	2.23	0.18	3.16	0.00
Lu	0.59	0.33	-	-	0.30	0.14	0.41	0.30
Hf	0.65	0.28	3.00	1.41	2.13	0.50	2.78	1.06
Bi	0.24	0.20	-	-	0.20	0.22	0.15	0.18
Th	0.80	0.45	2.00	2.24	1.06	0.37	1.95	1.42
U	0.30	0.22	2.50	-	0.53	0.28	0.59	0.25
Au	0.01	0.01	2.50	-	0.00	0.00	0.00	0.01
Cu	176.86	55.62	138.33	35.09	104.54	49.47	248.00	186.08
S	787.14	502.94	526.00	320.17	676.54	682.98	1262.50	541.07
Y/Nb	6.90	1.23	5.36	0.91	4.81	0.94	4.59	0.80

Zr/Nb	16.37	3.42	15.93	1.38	14.14	2.09	15.18	3.12
Ce/Y	0.43	0.03	0.54	0.14	0.61	0.12	1.10	0.65

Table 1. Averaged geochemical data, with standard deviations, for Eastern Succession mafic rock units of 1686Ma, 1660Ma (Toole Creek Volcanics) (Geoscience Australia Ozchem Database), 1600-1580Ma and 1530Ma.

Crustal Thickness

Mantle and Collins (2008) studied the Ce/Y contents of a number of basalts extruded from volcanoes globally, and proposed a relationship between the maximum Ce/Y value and the depth to Moho (where the depth was previously known from seismic data). They concluded that since the Moho is the typical level at which mafic magmas fractionate (at the base of the crust), the Ce/Y values of basalts reflects their depth (pressure) of fractionation. The maximum Ce/Y ratio for the 1686Ma generation of Eastern Succession mafic magmas studied yielded a value of 0.58. This corresponds to a depth of fractionation of approximately 3.2kbar, or ~11km. For subsequent generations of mafic magmatism at 1660Ma, 1600Ma and 1530Ma, the corresponding fractionation depths were 16km (maximum Ce/Y = 0.68), 18km (maximum Ce/Y = 0.75) and 37km (maximum Ce/Y = 2.21) respectively. These depths were then used as a basis for modeling the fractionation processes that lead to the compositions observed in the rocks. Using the thermodynamic modeling software pMelts (Ghiroso et al, 2002), and pressure set at 3.2kbar (for 1686Ma mafic compositions), hypothetical magma compositions were input into the model and iteratively refined until compositions typical of the Eastern Succession magmas was computed (Table 2). The models suggest that the geochemistry of these mafic rocks is consistent with derivation via the strong fractionation (to 58%) of a high Fe-picrite parental magma, with an initial liquidus temperature of 1377^{o}C at 3.2kb, and an initial (pre-fractionated) H_2O content of 0.5wt%. The Ce/Y ratios of 1660, 1600 and

1530Ma mafic rocks indicate they formed at pressures greater than 3.2kb, as would be expected from the effects of the post-1686 orogenic events. Modifying the pressure appropriately in the pMelts models yields similar results to the 1686 Ma model regarding Fe-rich picritic parental magmas and a high % fractionation. All the models require a contribution of H_2O in the source region in order to converge upon the real compositions.

Temp. (deg C)	P (kbars)	Fractionation (%)	SiO2 (wt%)	TiO2 (wt%)	Al2O3 (wt%)	Fe2O3 (wt%)	FeO (wt%)	MnO (wt%)
1377.15	3.2	0.01	48.28	0.51	9.25	1.34	9.07	0.15
1357.15	3.2	2.79	48.5	0.53	9.51	1.37	9.07	0.15
1337.15	3.2	5.36	48.71	0.54	9.77	1.41	9.05	0.15
1317.15	3.2	7.75	48.91	0.56	10.02	1.45	9.02	0.15
1297.15	3.2	9.97	49.12	0.57	10.27	1.48	8.97	0.15
1277.15	3.2	12.03	49.32	0.58	10.51	1.52	8.92	0.15
1257.15	3.2	13.96	49.52	0.6	10.75	1.55	8.85	0.15
1237.15	3.2	21.25	49.37	0.64	11.5	1.6	9.15	0.16
1217.15	3.2	31.92	48.93	0.72	12.76	1.64	9.81	0.18
1197.15	3.2	40.07	48.55	0.8	13.95	1.66	10.39	0.21
1177.15	3.2	46.49	48.24	0.86	15.08	1.67	10.9	0.23
1157.15	3.2	51.69	48	0.92	16.14	1.68	11.34	0.26
1137.15	3.2	58.01	47.99	1.03	16.31	1.79	12.07	0.29

Temp. (deg C)	P (kbars)	Fractionation (%)	MgO (wt%)	CaO (wt%)	Na2O (wt%)	K2O (wt%)	P2O5 (wt%)	H2O (wt%)
1377.15	3.2	0.01	16.95	12.33	1.03	0.08	0.03	0.51
1357.15	3.2	2.79	16.03	12.67	1.06	0.08	0.03	0.53
1337.15	3.2	5.36	15.13	13	1.09	0.09	0.03	0.54
1317.15	3.2	7.75	14.27	13.32	1.11	0.09	0.03	0.56
1297.15	3.2	9.97	13.44	13.64	1.14	0.09	0.03	0.57
1277.15	3.2	12.03	12.65	13.95	1.17	0.09	0.04	0.58
1257.15	3.2	13.96	11.88	14.25	1.19	0.1	0.04	0.6
1237.15	3.2	21.25	10.93	13.96	1.3	0.1	0.04	0.65
1217.15	3.2	31.92	9.81	13.06	1.48	0.12	0.05	0.75
1197.15	3.2	40.07	8.76	12.2	1.66	0.14	0.05	0.86
1177.15	3.2	46.49	7.77	11.36	1.85	0.15	0.06	0.96
1157.15	3.2	51.69	6.85	10.54	2.03	0.17	0.06	1.06
1137.15	3.2	58.01	6	9.72	2.21	0.19	0.07	1.22

Table 2. pMelts thermodynamic model results for a strongly fractionated (up to 60%) Fe-picrite parental magma composition fractionating at 3.2kbar (~12km depth), converging on the typical composition of 1686Ma Eastern Succession mafic rocks (between 1177^{o}C-1137^{o}C).

Irrespective of the age of the mafic rocks within the eastern part of the Eastern Succession (Soldiers Cap Group and parts of the Kuridala Formation), their chemistry is remarkably similar, indicating that they were all derived via similar processes from parental magmas of a common composition. On N-MORB normalised spiderdiagrams (Sun and McDonough, 1989), these mafic rocks display decoupled patterns of relatively flat heavy rare earth elements (HREEs) and high field strength elements (HFSEs), and a steeper slope for the light rare earth elements (LREEs) and lighter large ion lithophile elements (LILEs) (Fig.2a-d). A distinctive feature of the chemistry of these mafic rocks is a consistently high Pb content (25-30ppm), reflected by a greater than 80x enrichment of N-MORB on the spiderdiagram.

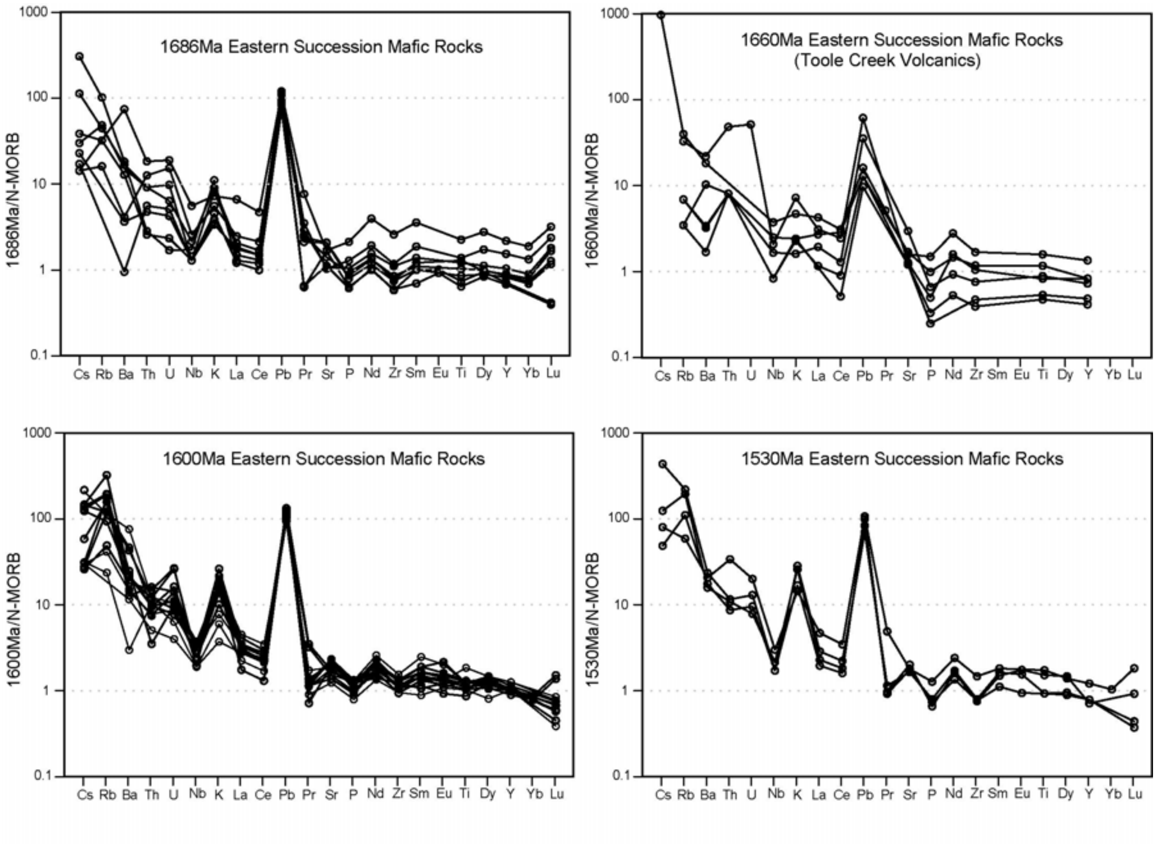

Figure 2. N-MORB Normalised spiderdiagram plots for different generations of the Mesoproterozoic mafic rocks of the Mount Isa Eastern Succession, at a) 1686Ma, b) 1660Ma (Toole Creek Volcanics), c) 1600-1580Ma (syn-metamorphic) and d) 1530Ma. All generations display a decoupled pattern of flat REE/HFSE elements, and sloped LILE elements.

The averaged data for the mafic rocks were also plotted on the tectonic discrimination diagrams of Pearce and Cann (1973), Pearce and Norry (1979) and Meschede (1986), in order to better constrain the tectonic environment into which they were emplaced (Fig. 3a-e). In all cases, the Eastern Succession mafic rocks plot in the MORB-Island Arc-Volcanic Arc fields of the diagrams. Some minor scatter in the data for the Zr-Ti-Sr plot (Fig. 3c) of Pearce and Cann (1973) can potentially be explained by the effects of metamorphic or hydrothermal overprinting on Sr and other alkali earth elements (Oliver et al, 2004; Butera et al, 2005).

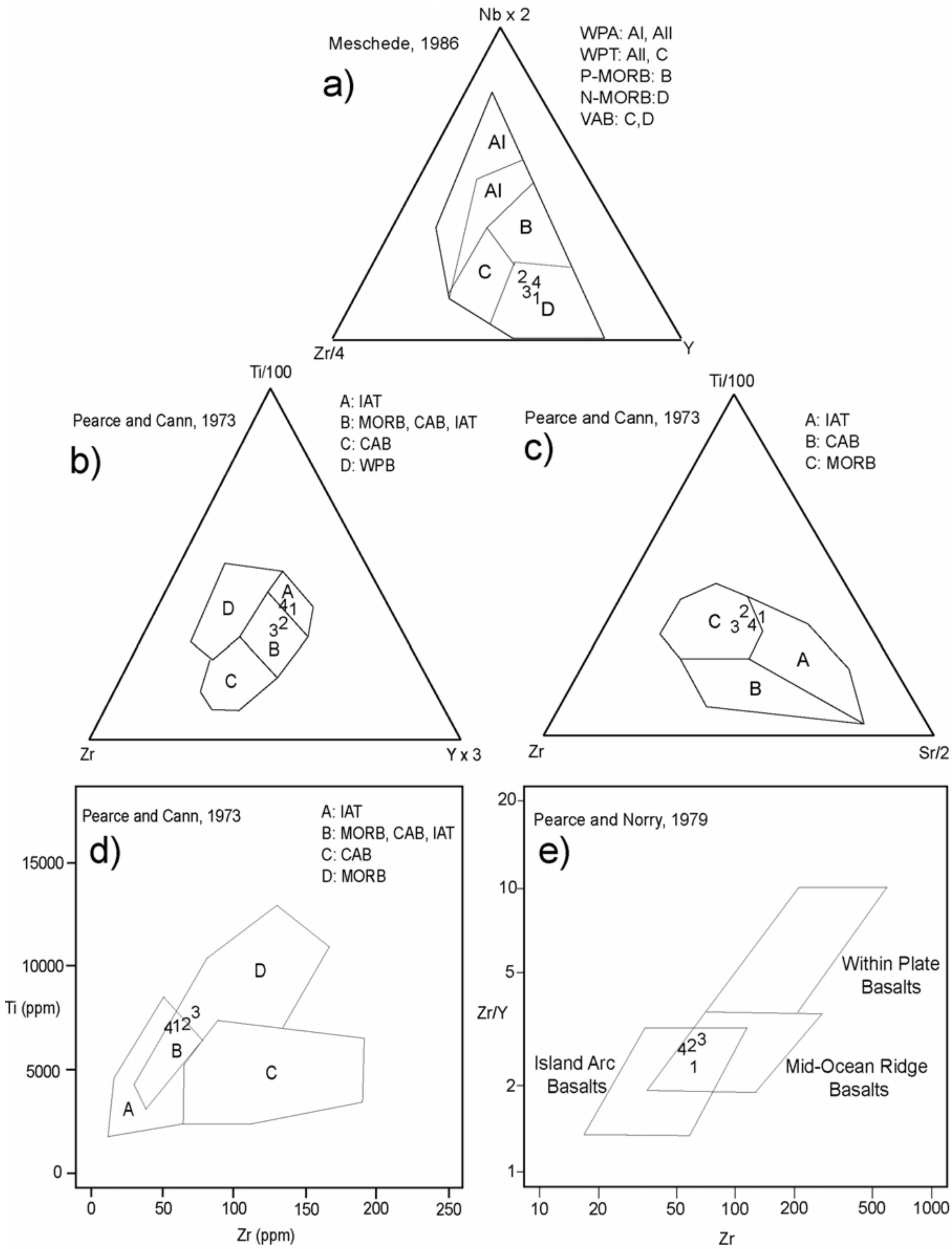

Figure 3. Averaged geochemical data for the different generations of the Mesoproterozoic mafic rocks of the Mount Isa Eastern Succession plotted on the tectonic discrimination diagrams of a) Meschede (1986), b,c,d) Pearce and Cann (1973) and e) Pearce and Norry (1979). 1 = 1686Ma, 2 = 1660Ma (TCVs), 3 = 1600-1580Ma, 4 = 1530Ma. Data for the Eastern Succession generally plot in the MORB-Island Arc-Volcanic Arc Fields. Standard deviations given in Table 1.

As previously mentioned, Myers et al (1996) defined the Archean-Proterozoic blocks of Australia as the North, South and West Australian cratons. On the eastern margin of the North Australian Craton are the Mount Isa-McArthur River and Georgetown Provinces, and on the eastern margin of the South Australian craton lies the Curnamona Province. All of these provinces share a similar tectono-stratigraphic history (Laing and Beardsmore, 1986; Whitnall et al, 1988; Laing, 1990; Laing, 1996; McDonald et al, 1997; O'Dea et al 1997; Scott et al, 2000; Giles et al, 2002; Raetz et al, 2002; Giles et al, 2004; Page et al, 2005). Mafic magmatism spans almost the entirety of the Mesoproterozoic across these provinces, and as such provides a useful means of cross-correlation.

Some of the oldest mafic rocks along the eastern margins of the North and South Australian cratons ocuur within the 1860Ma Leichhardt Volcanics that forms part of the the Kalkadoon-Leichhardt belt (KLB). The KLB is a north-south trending belt of the Mount Isa Inlier that separates the Western Succession from the Eastern Succession, and has been interpreted as the basement to the Mount Isa block (Laing and Beardsmore, 1986; Blake, 1987; McDonald et al; 1997). The ca. 1780Ma Magna Lynn Metabasalt crops out along the eastern flank of this belt. Wilson (1978) studied the felsic lavas of the Leichhardt Volcanics and the overlying mafic and felsic units of the Magna Lynn Metabasalt and Argylla Formation respectively. Wilson (1978) found that the Magna Lynn Metabaslt consisted of low-K tholeiites similar in nature to tholeiites overlaying calk-alkaline series volcanics in the southwestern United States. He also concluded that the sequence as a whole was consistent with a continental margin, similar in nature to the Andes. However other researchers concluded that these rocks were geochemically consistent with continental rifting

(Bultitude and Wyborn, 1982; Ellis and Wyborn 1984; Wyborn, 1988; Wyborn et al., 1988, 1998).

The Mount Isa Western Succession and McArthur River Basin host a number of discrete mafic intrusive suites. Scott et al (2000) used the stratigraphic associations of Jackson et al (2000) and defined a) the 1780 Ma Leichhardt Interval Association C (LIAC) which includes the extensive Eastern Creek Volcanics, b) the 1760 Ma Leichhardt Interval Association E (LIAE) (Quilalar Formation), c) the 1730 Ma Calvert Interval Association G1 (CIAG1) (Peters Creek Volcanics), and d) the 1710 Ma Calvert Association H (CIAH) (Fiery Creek Volcanics). Another event, the Slaughter Yard Creek Dolerite (SYCD) intrusions were associated with the ~1670Ma emplacement of the Sybella Batholith to the southwest of Mount Isa (Sisois-Pizanias, 2002). The 1760Ma LIAE event may correspond to the comparably aged Marraba Volcanic event on the western margin of the Eastern Succession. The Curnamona Province (Broken Hill and Olary Block) was intruded by voluminous tholeiitic sills and dykes at ~1685Ma (Nutman and Ehlers, 1998; Conor and Fanning, 2001; Raetz et al, 2002). These high Fe tholeiites share similar geochemical characteristics to those from the eastern margin of the Mount Isa Eastern Succession (Williams, 1998). 1675Ma mafic intrusives from the Georgetown Province (Black et al, 1998) may also share a common chemical affinity to those of the Eastern Succession (Withnall et al, 1988).

Averaged geochemical data for the studied mafic units are shown in Table 3. Depth to Moho (or fractionation depth) of the Curnamona Province and the Georgetown Inlier units were calculated by use of the maximum Ce/Y method (Mantle and Collins, 2008). The Curnamona Province, during the period of mafic magmatism at ~1685, had a crustal thickness of ~11km (maximum Ce/Y = 0.58), and the Georgetown Inlier at ~1675Ma had an identical crustal thickness (~11km; maximum Ce/Y = 0.58). The maximum Ce/Y ratio of 1.44 for the 1860Ma Leichhardt Volcanics represents a crustal thickness of ~28km. Minimum crustal thickness for the time of mafic magma emplacement in the 1780Ma Leichhardt Interval Association C, 1760Ma Leichhardt Interval Association E, 1730Ma Calvert Interval Association G1, 1710Ma Calvert Association H and the 1670Ma Slaughter Yard Creek Dolerite are 31km (average Ce/Y = 1.56), 29km (average Ce/Y = 1.46), 34km (average Ce/Y =1.81), 42km (average Ce/Y = 3.02) and 40km (maximum Ce/Y= 2.66), respectively (Table 3).

Age	Curnamona 1685Ma		Georgetown 1678Ma		Leichhardt 1860Ma	SYCD 1670Ma	LIAC 1780Ma	LIAE 1760Ma	CIAG1 1720Ma	CIAH 1710Ma
# samples	17		20		8	3	161	10	163	23
	Average	st. dev.	Average	st. dev.	Average	Average	Average	Average	Average	Average
SiO2	50.34	0.74	49.12	1.20	50.23	-	50.7	51.83	49.47	49.95
TiO2	1.24	0.28	1.30	0.46	1.42	-	1.64	1.8	2.41	2.62
Al2O3	14.07	0.99	14.68	2.26	14.34	-	14.05	14.34	13.78	14.25
Fe2O3T	14.52	2.03	13.75	2.65	12.50	-	12.85	13.54	12.63	14.2
MnO	0.34	0.17	0.20	0.04	0.23	-	0.14	0.31	0.13	0.08
MgO	6.80	0.96	6.17	0.88	6.46	-	8.09	2.89	5.41	2.49
CaO	10.50	1.03	11.02	1.56	8.86	-	3.91	2.73	3.03	2.97
Na2O	1.36	0.44	1.93	0.58	2.34	-	1.89	0.84	1.04	0.56
K2O	0.55	0.23	0.35	0.34	1.28	-	2.31	7.49	5.88	8.53
P2O5	0.11	0.03	0.11	0.04	0.15	-	0.19	0.27	0.5	1.2
Ba	204.17	56.89	103.65	82.67	272.88	-	281	160	1583	1454
V	357.50	101.12	424.55	166.34	342.63	-	296	276	274	179
Cr	187.75	73.77	121.10	45.65	112.00	-	137	76	39	35
Ni	80.62	29.09	68.25	17.20	107.75	-	82	51	25	27
Zn	90.87	38.40	102.20	24.55	112.25	-	110	128	104	45
Ga	13.60	1.67	20.00	1.53	20.33	-	19	20	21	20
Pb	10.40	13.07	6.88	4.06	6.38	-	13	37	18	13
Rb	36.00	30.04	14.22	19.64	74.50	-	78	182	109	180
Sr	146.71	46.73	167.05	60.66	155.13	-	108	82	106	85
Y	21.13	5.74	22.90	7.81	29.13	-	32	46	43	58
Zr	85.15	38.40	76.60	28.16	115.50	-	169	180	218	398
Nb	5.17	1.17	4.75	1.70	8.00	-	11	22	17	36
La	5.33	0.58	4.75	2.38	14.13	-	25	36	38	81
Ce	12.17	13.60	7.92	6.38	30.50	-	50	66	78	175
Nd	16.00	9.90	7.00	3.03	14.75	-	26	38	39	79
Hf	6.00	0.00	3.50	1.50	4.00	-	-	-	-	-
Th	2.50	0.71	3.50	1.12	3.88	-	6	9	9	9
U	1.00	0.00	1.50	0.55	2.06	-	2	4	2	3
Cu	179.62	129.16	148.45	112.85	147.63	-	162	40	63	20
Y/Nb	4.94	0.95	4.92	0.80	3.78	2.47	2.9	2.09	2.53	1.61
Zr/Nb	16.33	1.16	16.03	1.32	14.69	11.95	15.6	11.9	15.2	11.6
Ce/Y	0.46	0.16	0.41	0.14	1.08	2.22	1.56	1.43	1.81	3.02

Table 3. Averaged geochemical data, for the 1685Ma Curnamona Province, 1675Ma Georgetown Inlier and 1860Ma Leichhardt Volcanics mafic rock units (Geoscience Australia Ozchem Database), 1670Ma Slaughter Yard Creek Dolerites (SYCD) (Sisois-Pizanias), and the LAIC (Leichhardt Association Interval C), LAIE (Leichhardt Association Interval E), CIAG1 (Calvert Association Interval G1) and CIAH (Calvert Association Interval H) intervals of the Mount Isa Western Succession and McArthur River Basin (Scott et al, 2000).

Data plotted on N-MORB normalised spiderdiagrams (Sun and McDonough, 1989) reveal that the mafic magmas of the Curnamona Province and Georgetown Inlier share a decoupled pattern of flat HREEs and HFSEs and steeper LREEs and LILEs, similar to those of the Mount Isa Eastern Succession. They also display strong positive Pb and K, and moderate negative Nb anomalies (Fig. 4a,b). Normalised spiderdiagram plots for the Mount Isa Western Succession, Kalkadoon-Leichhardt Belt (Leichhardt Volcanics) and McArthur River Basin data also display K and Pb and Nb anomalies. The REEs are enriched 1.5 to 5 times N-MORB. Additionally, they do not display a decoupled trend as for the other data, but rather a steadily descending linear pattern.

On tectonic discrimination plots, data for the Curnamona Province and Georgetown Inlier plot similar to the Mount Isa Eastern Succession, predominantly in the MORB-Island Arc-Volcanic Arc fields, while data for mafics of the Western Succession and McArthur River Basin (Scott et al, 2000) typically plot in the Within Plate-Continental Arc-MORB fields(Fig. 5a-e).

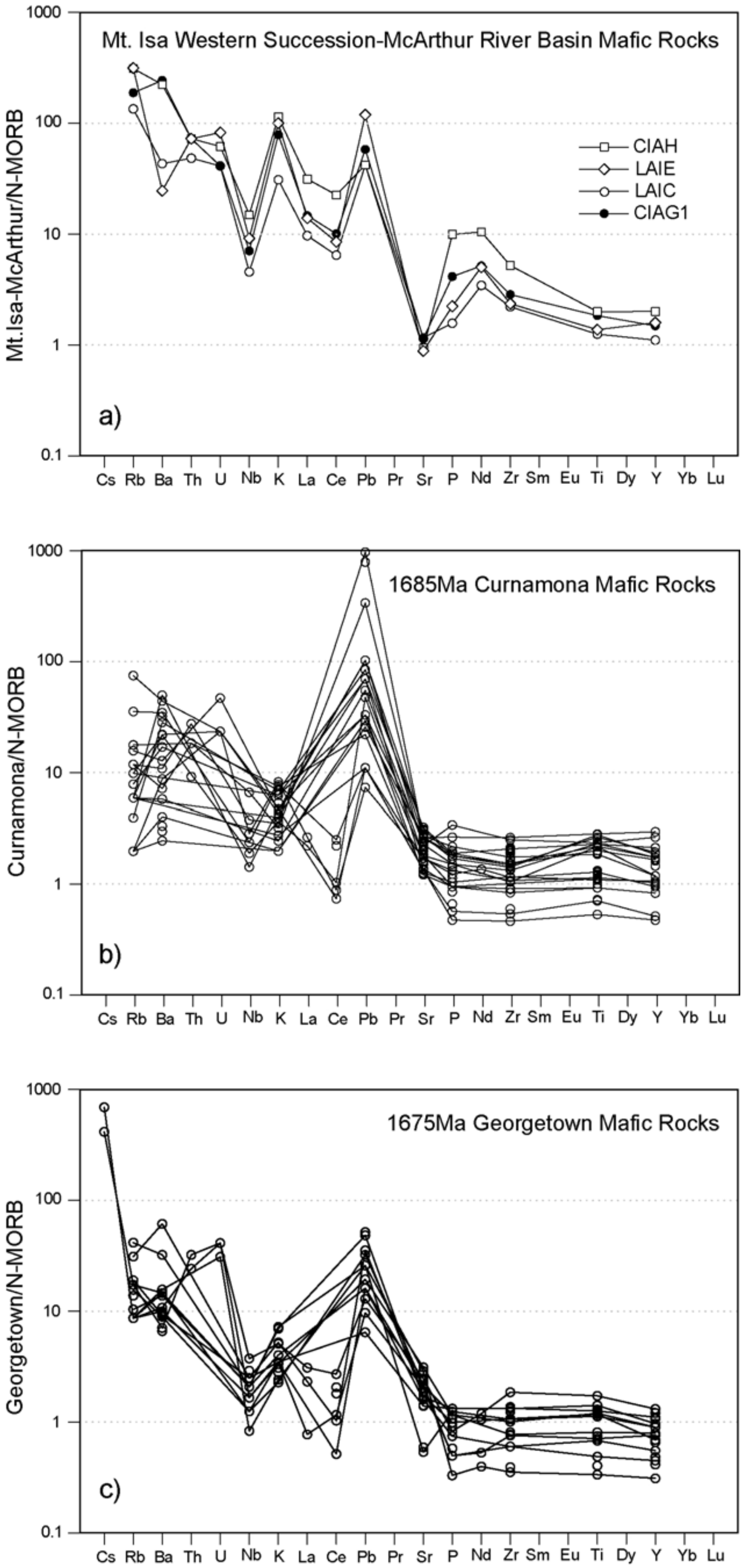

Figure 4. N-MORB Normalised spiderdiagram plots for a) 1685Ma Curnamona Province mafic rocks. b) 1675Ma Georgetown Inlier mafic rocks. C) Mafic rock generations of the Mount Isa Western Succession and McArthur River Basins (data from Scott et al, 2000). LAIC = 1780Ma Leichhardt Association Interval C, LAIE = 1760Ma

Leichhardt Association Interval E, CAIG1 = 1720Ma Calvert Association Interval G1, CAIH = 1710Ma Calvert Association Interval H. The Curnamona and Georgetown mafic rocks display similar decoupled normalised patterns to those of the Eastern Succession, while the Western Succession-McArthur River mafic rocks display a consistently sloped trend (Winter, 2001;).

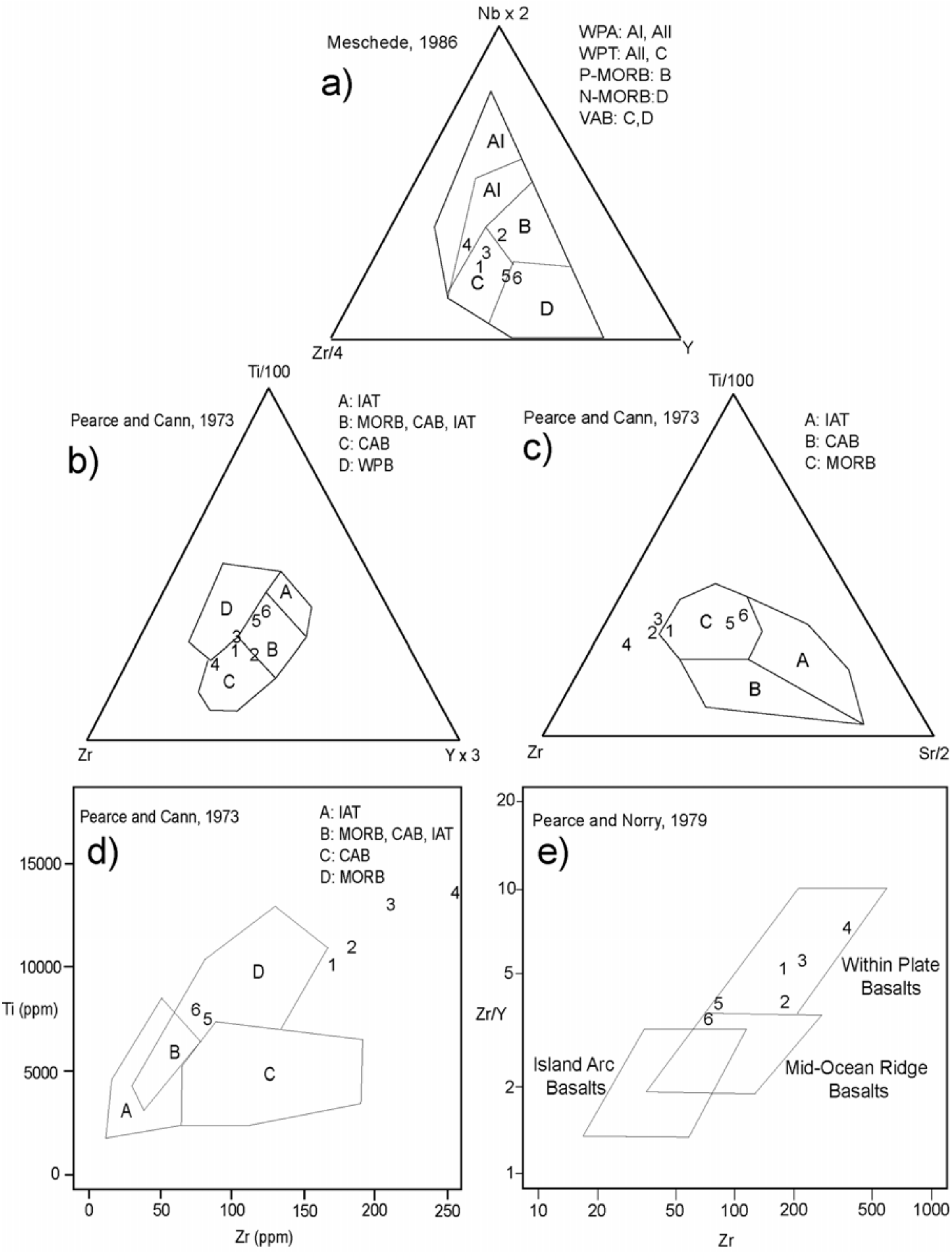

Figure 5. Averaged geochemical data for the mafic rocks of the Curnamona Province, Georgetown Inlier and Mount Isa Western Succession-McArthur River Basin (Scott et al, 2000), plotted on the tectonic discrimination diagrams of a) Meschede (1986), b,c,d) Pearce and Cann (1973) and e) Pearce and Norry (1979). 1 = LAIC, 2 = LAIE, 3 = CIAG1, 4 = CIAH, 5 = Curnamona Province, 6 = Georgetown Inlier.. Data for Curnamona and Georgetown plot similarly to the Eastern Succession (Fig. 3), while data for the Western Succession and McArthur River Basin typically plot in the MORB-Continental Arc-Within Plate Basalt fields. Standard deviations given in Table 3.

Discussion

Our analysis reveals changes within the mafic rock geochemistry of the Mount Isa block in time and space that may not be consistent with previous hypotheses for uniform tectonic and/or geodynamic evolution. The results of our study define two distinct geochemical groupings, the Western Domain (mafic magmas of the Mount Isa Western Succession, McArthur River Basin and the Kalkadoon-Leichhardt Belt) and the Eastern Domain (Mount Isa Eastern Succession, Curnamona Province and the Georgetown Inlier). The most conservative interpretation of this change is that it reflects a change in the chemistry of the mantle source region.

Eastern and Western Domain data for Zr/Nb vs Y/Nb were compared to global geochemical data for continental flood basalts (CFBs) and back-arc basalts (Fig. 6). All Western Domain data plot in the CFB field, while the Eastern Domain data plot in the back-arc field. This suggests that there was either a nearby, active subduction zone related to the back-arc signatures, or that earlier subducted crust had entered the mantle source region to be subsequently incorporated in partial melting and basalt production during rifting. Importantly, the boundary between the diverging datasets lies between the Mount Isa Western and Eastern Successions, rather than along a previously defined boundary between cratons (Myers et al., 1996). Interestingly, the Leichhardt Volcanics (KLB) also display an affinity to CFB magmas on the Zr/Nb vs Y/Nb plot, suggesting that the actual boundary lies to the east of the Kalkadoon-Leichhardt belt, in the western part of the Eastern Succession.

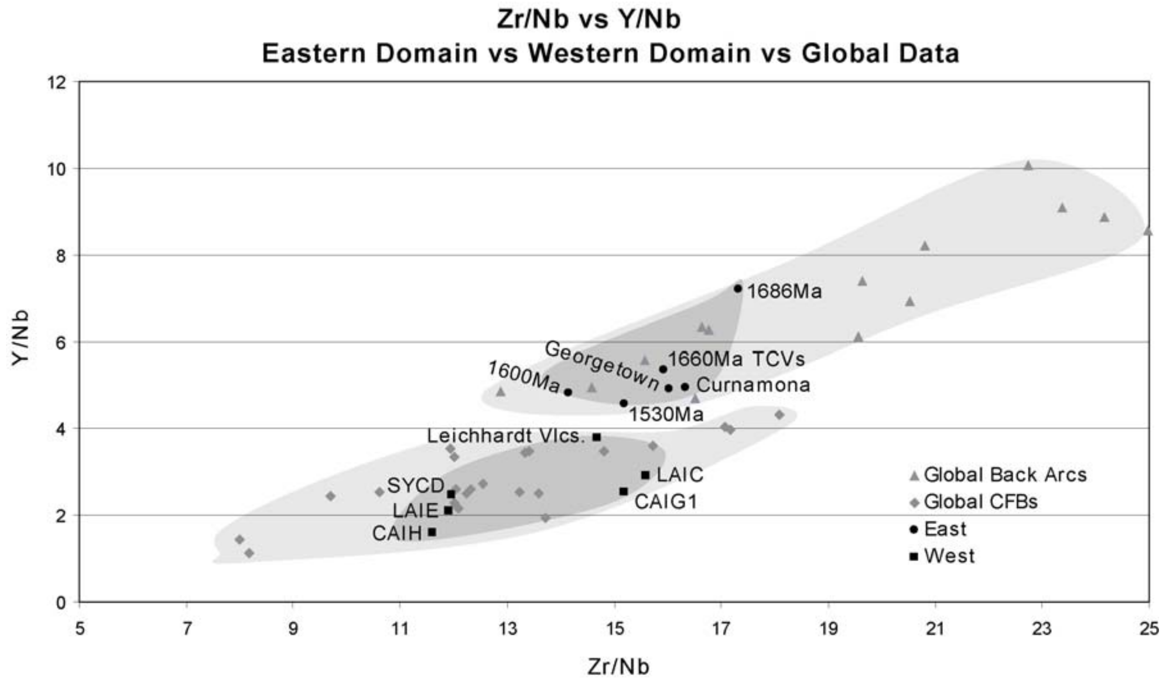

Figure 6. Zr/Nb vs Y/Nb diagram for the mafic rock units of the Eastern Succession (1686Ma, 1660Ma,1600-1580Ma, 1530Ma), Western Succession-McArthur River Basin (LIAC, LIAE, CIAG1, CIAH, SYCD), Kalkadoon-Leichhardt Belt (Leichhardt Vlcs), Curnamona Province and Georgetown Inlier. Data and fields for global continental flood basalts (CFBs) and back arc basins (BABs) are plotted for comparison. The Eastern Succession, Curnamona and Georgetown mafic rocks plot within the back arc basalt field, while the Western Succession, McArthur River Basin and Kalkadoon-Leichhardt Belt mafic rocks lie within the field for continental flood basalts. Global data drawn from GEOROC database. After Meschede (1986).

The notion that the Eastern Domain magmas were emplaced into a back arc basin between ~1690Ma and ~1660Ma is consistent with their normalised spiderdiagram patterns that share affinities with those of the Sunda Arc (Fig. 7a; Gerbe et al, 1992; Turner et al, 2001) and the Kermadec Arc (Fig. 7b; McCulloch and Gamble, 1991; Gamble et al, 1993; Regelous et al, 1997; Turner et al, 1997; Ewart et al, 1998; Smith et al, 2003). The spiderdiagram patterns of the Western Domain magmas are similar to those of the Karoo Province of South Africa (Fig. 7c; Ellis and Wyborn, 1984; Scott et al, 2000) and the Central Plains of the Midcontinental Rift System (Fig. 7d; Marshall and Lidiak, 1996). Additionally, there is a difference in both the absolute values and the temporal pattern of maximum and average Ce/Y data to the east and west of the Kalkadoon-Leighhardt Belt (Fig. 8). We thus infer that the thickness of the crust at the time of mafic magma emplacement differed between the domains, and that the evolution of this thickness also varied. The Western Domain progressively thickened, while the Eastern Domain thinned, between ~1800Ma and 1686Ma (Fig. 8). After 1686Ma, the crust of both the Eastern and Western Domains thickened (Fig. 8), synchronous with the ~1600-1580Ma Isan Orogeny. For the earlier period, a crustal thickness of ~12km at the time of mafic magma emplacement in the Eastern Domain is consistent with a strongly rifted back arc basinal tectonic environment. The apparently thicker crust (~28-42km) during the period of magmatism in the Western Domain is comparable with other within-plate continental flood basalt provinces (Wilson, 1995). The tectonic environment suggested by the crustal thickness inferred from Ce/Y ratios is also comparable with the inferred environment suggested by other trace elements on tectonic discrimination diagrams.

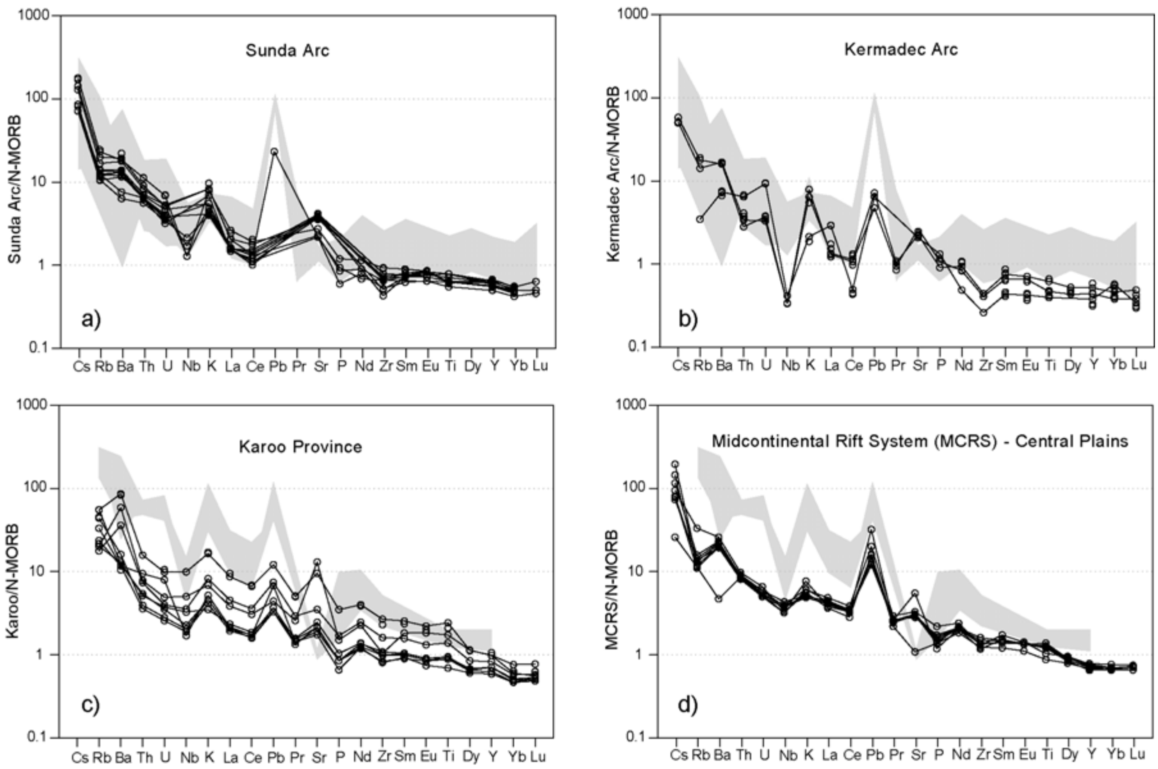

Figure 7. N-MORB normalised spiderdiagrams for geochemical data of mafic rocks in the a) Sunda and b) Kermadec Arc, with fields for the 1686Ma generation of mafic rocks from the Eastern Succession; and, c) Karoo Province and d) Midcontinental Rift Zone (Central Plains), with fields for the averages of the Western Succession-McArthur River Basin mafic units of Scott et al (2000). The de-coupled slope of the Eastern Succession (+Sunda/Kermadec Arcs) distinguish the mafic geochemistry from the gently sloping nature of the Western Succession/Macarthur River(+Karoo/MCRS), focussing on a distinction between the two datasets (not necessarily the precise tectonic environment) (Pers. Comm Bill Collins, 2006; Winter, 2001).

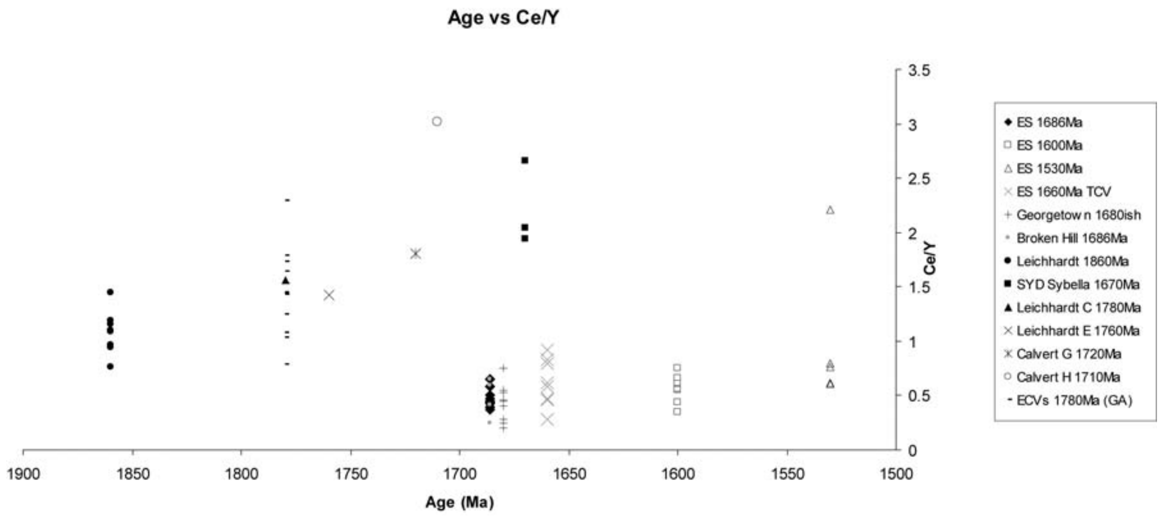

Figure 8. Age vs Ce/Y plot for mafic units of the Mount Isa Inlier, Georgetown and Broken Hill provinces. As Mantle and Collins (2008) suggest increase Ce/Y with crustal thickness, it is apparent that Western Domain (Western Succession, Kalkadoon-Leichhardt Belt and McArthur River Basin) mafics were emplaced into a thicker crust than the Eastern Domain (Eastern Succession, Curnamona and Georgetown), and that the evolution of crustal thickness was different between the two domains. Although little overlap in the age of the mafic emplacement occurs, at 1686Ma, the Eastern Succession sat on ~11km of crust, while the Western Succession at Sybella Batholith time (Slaughter Yard Creek Dolerite (~1670Ma) sat on >40km of crust.

The results presented here suggest a variation on the hypotheses of Giles et al (2002). These authors proposed that 1800Ma – 1670Ma subduction in the Arunta Block of central Australia led to magmatism in a far-field back arc basinal setting for domains of the North Australian Craton, including all of the Mount Isa block. However, because the Eastern Domain magmas show a consistent back arc affinity with very thin crust before 1600 Ma, as opposed to the magmas of the Western Domain, we suggest that subduction most probably occurred relatively close to the eastern edge of the Mount Isa Eastern Succession, Curnamona and Georgetown. Although this does not negate the model for a collisional boundary at the Arunta at the same time, the earliest onset of Australia-Laurentia plate collision (the AUSWUS model of Karlstrom et al., 1999, 2001) may have been the cause. There is a small possibility that an old plate boundary was present within the Mount Isa Block, such as along the “Pilgrim Worm” inferred from analysis of the aeromagnetic data

(Blenkinsop et al., 2005), which correlates roughly with the change in mafic magma compositions at the eastern margin of the Marraba Volcanics. However, widespread c. 1760 Ma stratigraphic units (e.g. Corella Fm) straddle this boundary (Blake, 1987; Foster and Austin, 2005), so the boundary, if it existed, was probably older than c.1780 Ma Argylla Volcanics.

The model of proximal subduction to the east of the eastern margin of the North and South Australian cratons explains concurrent back arc rifting across the eastern margin of the whole of the Australian continent, consistent with plate scale processes between Australia and the southwest United States in the AUSWUS model. This model (Fig. 9a, b) supports the conjunction of the Mount Isa Eastern Succession, Curnamona Province and Georgetown Inlier throughout much of the Mesoproterozoic, as first suggested by Laing and Beardsmore (1986), and Laing (1990). The eastern edge of the Kalkadoon-Leichhardt block in the western domain may have represented the distal, western shoulder of a north-south trending back-arc rifting zone. Significantly, it is supportive of a model that interprets the Eastern Succession, Curnamona Province and Georgetown Inlier as a separate domain or craton, formed on juvenile crust, younger and thinner than that of the Mt. Isa Inlier and North Australian craton., This shares more similar aged and natured tectono-metamorphic and lithological history and similar radiogenic isotope data for mineral deposits and rocks in the Eastern Domain and the western margin of Laurentia than the Western Domain (Western Succession, Kalkadoon-Leichhardt Belt and McArthur River Basin (Wilson, 1978; Wooden and DeWitt, 1991; Wooden et al, 1994; Zhao and McCulloch, 1995; Hawkins et al, 1996; McDonald et al, 1997; Ramo and Calzia, 1998; Karlstrom and Williams, 1998; Karlstrom et al, 2001; Mark et al, 2005a; Foster and Austin, 2005).

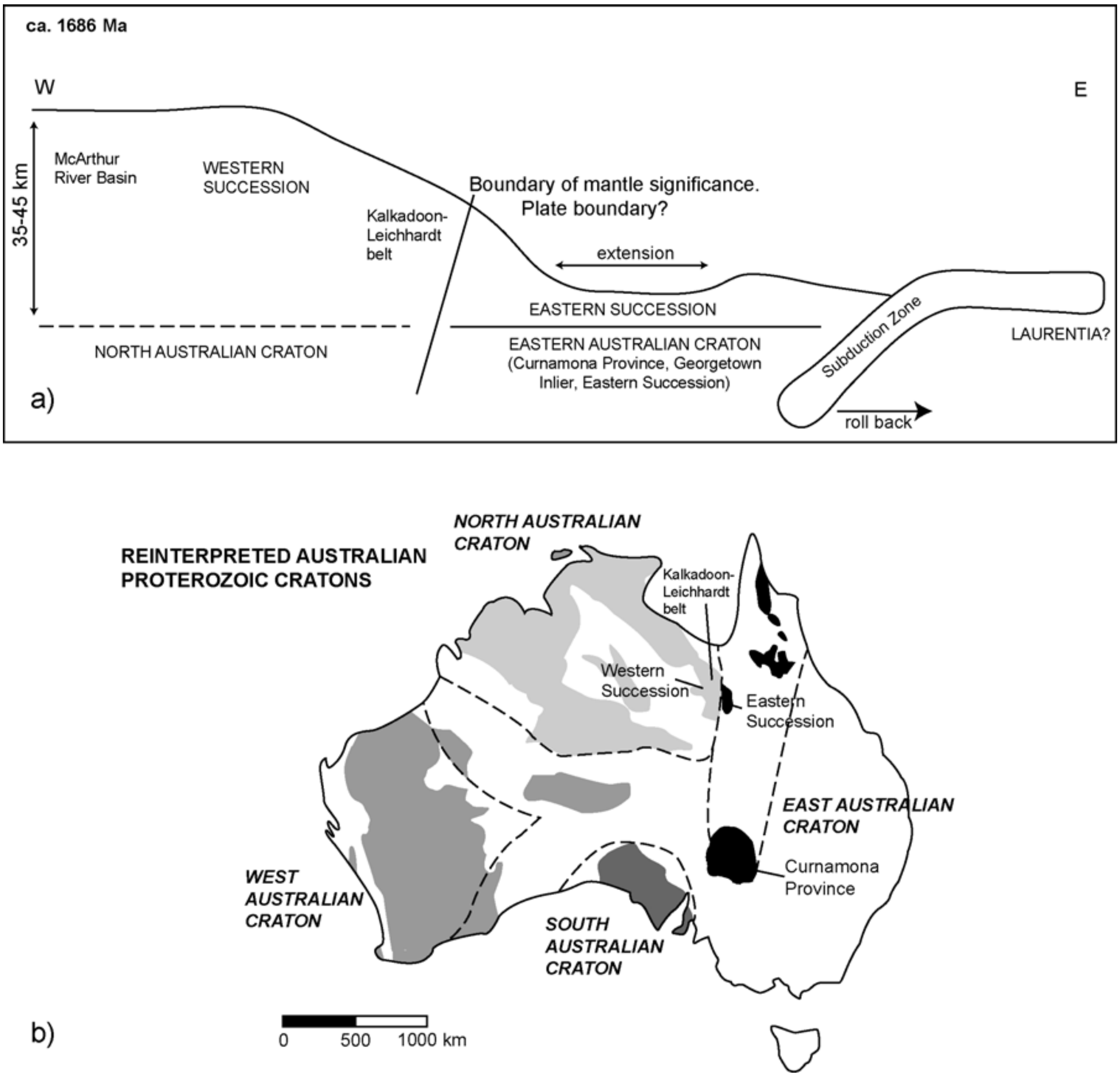

Figure 9. a) Tectonic regime of the eastern margin of the Austalian continent at ca. 1686Ma, showing the development of a back arc basin in response to slab roll back from a subducting slab to the east. b) Reinterpreted Proterozoic Cratons of Australia, including the newly defined East Australian Craton (Mount Isa Eastern Succession, Curnamona Province, Georgetown Inlier).

The mafic magmatic and tectonic distinction between the Eastern and Western Domains of Mesoproterozoic Australia is accurately reflected by their metallogenic nature. Importantly, it implies that the distribution of Cu-Au-(Fe), IOCG and BHT-type mineralisation in the Eastern Domain, and Mount Isa style and stratiform Pb-Zn-Ag mineralisation in the Western Domain may be related to the geochemistry of mafic rocks (or nature of the underlying mantle), the thickness of the crust, or the influence of these factors on the tectonostratigraphic and tectonothermal evolution.

Further, the metallogenic nature of the Eastern Domain is much more analogous in style to southwest Laurentia than the Western Domain (Condie, 1987; DeWitt, 1987; Wooden and DeWitt, 1991; Wooden et al, 1994; Karlstrom, 1991; Williams, 1998b; Skirrow and Ashley, 1999; Skirrow et al, 1999; Williams and Pollard, 2003; Williams et al, submitted).

Conclusions

Based on the distinct evolutionary trends for mafic magmas of the domains of Mesoproterozoic Australia, we suggest that the Mount Isa Western Succession and Macarthur River Domains continue to be recognised as part of the North Australian Craton, while the Mount Isa Eastern Succession, Curnamona Province and the Georgetown Inlier be referred to as the East Australian Craton, in agreement with the earlier-termed ‘Diamantina Orogen’ of Laing and Beardsmore (1986) and Laing (1990). Furthermore, during the period of 1860Ma to 1500Ma, the divergence of the geochemical evolution of mafic source regions was focussed around the western margin of the Mount Isa Eastern Succession, and we henceforth consider this area to be a major boundary of either crustal or mantle significance across which the nature of the controlling processes of mineralization are distinct. The variance of the geochemistry of mafic magmatism between the North and Eastern Australian Cratons reflects complex influences on the chemical and physical processes that enact upon the mantle source regions for the mafic melts. It is the disparity in mantle chemistry between terranes, perhaps the influence of new or old subducted material, and the nature of the crustal thickness, that we postulate controls the potential to host significant IOCG and BHT-type deposits (East Australian Craton) versus Mt. Isa style

Cu-Pb-Zn and stratiform Pb-Zn-Ag mineralisation (North Australian Craton). In this context, McDonald et al (1997) speculated that a high velocity crustal slab sitting underneath the Mt Isa Eastern Succession reflected part of an Archean to Paleoproterozoic continental assembly process. Similarly, a slab of subducted oceanic crust sitting in the mantle lithosphere to the east of the eastern margin of the East Australian Craton may have provided the appropriate mantle chemistry to contribute to subsequent generation, in an extended continent, of magmas and volcano-sedimentary input that led to the formation of Palaeo-Mesoproterozoic IOCG and BHT deposits.

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CHAPTER 2

The role of mafic rocks in the genesis of Iron oxide-Copper-Gold deposits, Mount Isa Eastern Succession, Northwest Queensland.

The role of mafic rocks in the genesis of Iron oxide-Copper-Gold deposits, Mount Isa Eastern Succession, Northwest Queensland.

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Abstract

In the Mesoproterozoic Mount Isa Eastern Succession, mafic rocks and magmas contributed sulphur and metals to IOCG ore deposition over a protracted (~170My) period. Between 1686 Ma and 1660Ma, S and metals (Cu, Au, Zn, Fe, Ni, Co) were exsolved from crystallising strongly fractioned back-arc tholeiitic magmas into active extensional faults, and surrounding country rocks. During Isan peak-metamorphism, at ~!600Ma-1580Ma, significant amounts of S, Cu, Au, Zn, Ni, Co and Cr were leached from mafic rocksand crustal accumulations, and led to the deposition of early IOCG and base metal deposits. Subsequent albitic alteration associated with the hydrothermal fluids of the ~1550Ma-1490Ma Williams-Naraku Batholith may also have sequestered sulphide material from mafic rocks. This study highlights the possibility that the previously held consensus that the Williams-Naraku Batholith of felsic-intermediate magmas contributed the bulk of the metals to the Eastern Succession mineral deposits, may not necessarily be the case, but rather, fluids

derived from these magmas remobilised previously existing mafic derived metal accumulations.

Keywords: IOCG deposits, Mafics, Sulphur, Metals, Exsolution, Metmorphism

Introduction

The Eastern Succession of the Mount Isa Inlier hosts numerous Fe-oxide Cu-Au (IOCG), Cu-Au, Cu-only, Au-only, Broken Hill-type Pb-Zn-Ag (BHT) and other precious metal deposits. Some of the more prominent of these (Fig. 1) include Ernest Henry (IOCG), Osborne (IOCG), Selwyn-Starra (IOCG), Eloise (IOCG), and Cannington (BHT) (Pollard et al, 1998; Williams, 1998; Williams and Pollard, 2003; Williams et al, 2005). Although numerous genetic models for IOCG and BHT-type mineralisation have been constructed in the last decade, many gaps still remain in the understanding of the critical ingredients and processes for ore deposition.

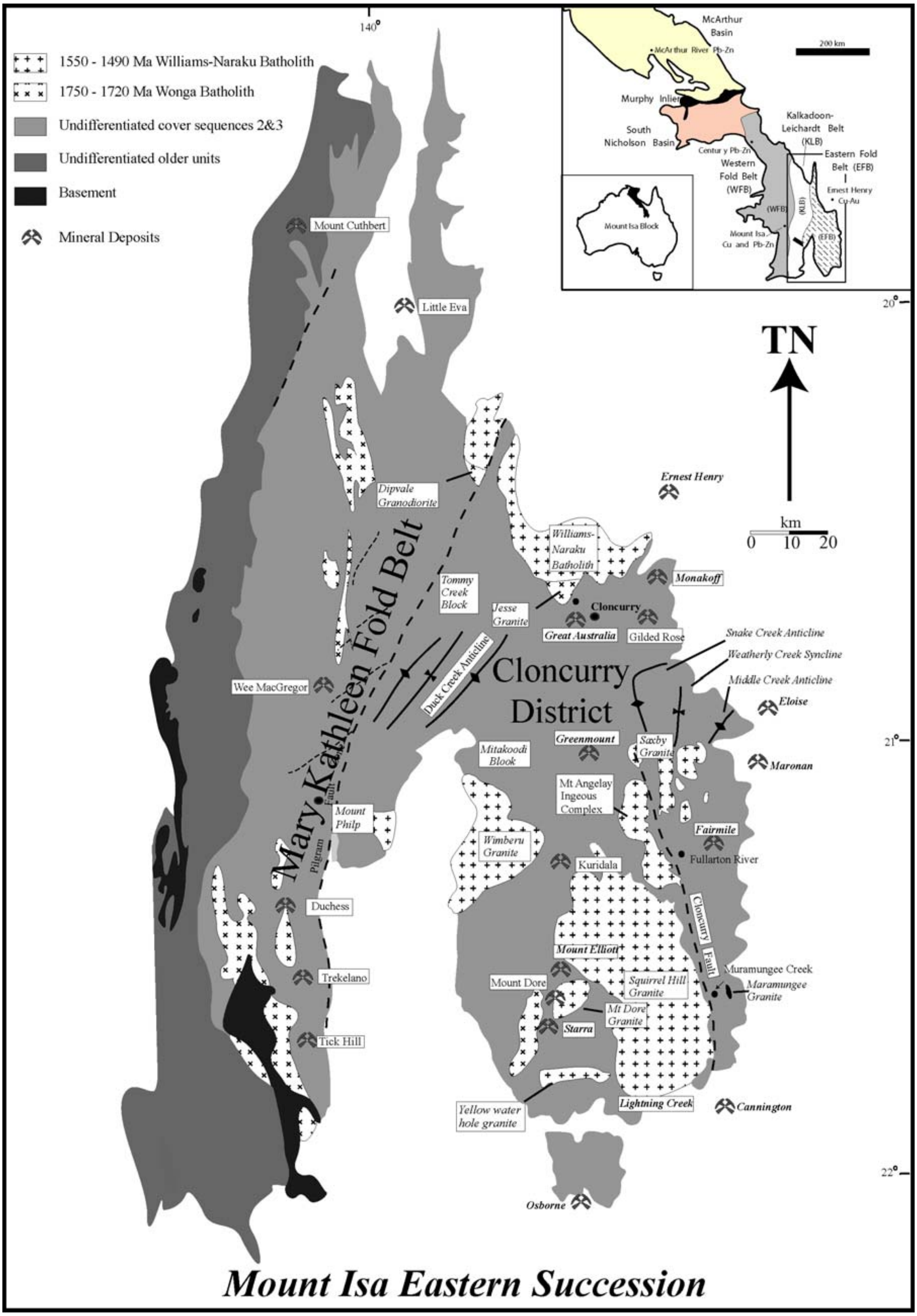


Figure 1. Mineral deposit and tectono-stratigraphic map of the Eastern Succession. (after Williams (1998).

Many previous workers have concluded that the sources of metal, sulphur, and fluids for IOCG mineralisation in this district were predominantly derived from the ~1550-1490Ma Williams-Naraku Batholith of felsic to intermediate intrusive rocks (Rotherham, 1997; Wyborn, 1998; Perring et al 2000; Williams and Pollard, 2003; Mark et al, 2005. Williams (1993) and Oliver et al. (2004), while favouring magmatic fluid sources, also note that these fluids may have leached substantial mass from the surrounding country rocks prior to ore deposition. However, a number of key observations of the ore-forming systems highlight significant problems with a unified model for ore genesis in which the Williams-Naraku Batholith was instrumental. Firstly, molybdenite sampled from the ore association at the Osborne deposit has a Re-Os age of 1595 ± 6Ma (Gauthier et al., 2001), and albitization surrounding syn- to post-ore pegmatites has associated titanite with a U-Pb age of 1595Ma (Rubenach et al, 2001). These ages for mineralisation and cooling pre-date the Williams Batholith by ~60 My. There are no felsic batholiths known in the Osborne area of this age - the pegmatites appear to be derived by local partial melting of metasediments (Rubenach, 2005).

Secondly, Perring et al. (2000) examined fluid inclusions from the Lightning Creek ironstone prospect, a large tonnage (> 1 billion tonnes) magnetite body inferred to be generated by magmatic-hydrothermal processes late during the fractionation of a body of the Williams Batholith. They found abundant barium and copper in the fluid inclusions, yet there are no barite- or copper-bearing sulphides in the prospect. They concluded that hydrothermal fluids derived from the Williams batholith were sulphur-poor or absent, or the fluids were too hot. Given the low solubility of barite over most geological conditions, their model did not explain the source of sulphur for the ~1530Ma IOCG deposits. To make the matter more complicated, sulphur isotopic studies for ore systems in the Eastern Succession revealed a dominantly magmatic origin for sulphur (Davidson and Dixon, 1992; Rotherham et al, 1998).

Finally, at the Osborne, Selwyn and Eloise deposits, observations have been made of primary sulphide and magnetite mineralisation folded or deformed by the ~1600-1580Ma peak-metamorphic shortening event, suggesting that at least some ore components were present at these deposits before or during metamorphism. In the nearby Mary Kathleen Fold Belt (Fig. 1), there is an apparent absence of Williams-Naraku Batholith age intrusions. This belt displays comparable styles of albite and Na-Ca alteration to the Cloncurry area (Oliver, 1995), and includes alteration dated at 1550 to 1527 Ma (Oliver et al., 2004), raising the possibility that not all fluids of Williams-Naraku age were directly derived from them. The Mary Kathleen Fold Belt also contains a significant IOCG resource (Trekelano) and the Tick Hill Au deposit, suggesting either non-Williams ore components were contributed to these deposits, or the deposits were not formed at Williams time.

Thus, despite a proliferation of Ar-Ar ages in the range 1540 to 1490 Ma for Eastern Succession IOCGs (Perkins & Wyborn, 1998), dating of pre-ore albitization titanites at 1550 to 1525 Ma (Oliver et al., 2004), and abundant evidence for post-metamorphic sulphides and related alteration, observations of deformed ores and older U-Pb and Re-Os ages of many of these deposits point to inherited components. The original understanding of the age of peak metamorphism at the time of many earlier studies was focussed around the 1550 Ma age inferred from the Western Succession and Mary Kathleen orebody (Page, 1983), such that the 1550 to 1490 Ma Williams Batholith was regarded as immediately post-peak metamorphic. Evolving metamorphic-magmatic fluid systems were thus seen as viable (e.g. Baker et al., 2001). More recent recognition of earlier metamorphism, peaking at 1600-1580 Ma with D_2 deformation (Giles and Nutman, 2002; Hand and Rubatto, 2002), requires a reinterpretation of earlier workers' paragenetic stages.

Mafic rocks and magmas have recently been implicated in the genesis of IOCG and other mineralisation types, globally. In a study of the mineralising fluids for the giant Olympic Dam deposit in South Australia, Johnson and McCulloch (1995) concluded that mafic/ultramafic rocks were crucial to the genesis of the deposit. Based on a ≥13% contribution of rare earth elements from mantle derived material to the ore, the model inferred a minimum contribution of 50% of the Cu in the deposit from mafic material, either via leaching of pre-existing mafic rock, or through direct exsolution from the magma. Contrasting stable isotopic signatures of magnetite and hematite suggested that ore deposition involved two distinct fluids. However, the isotopic data did not allow the distinction between a model involving ore deposition by fluid mixing (e.g. Oreskes and Einaudi, 1992), or a model involving temporally discrete overprinting of magnetite by hematite + Cu-sulphides (Gow et al., 1994).

The 1686/1660Ma magmatic event(s) of voluminous intrusive and extrusive mafic magmatism, within the Eastern Succeession, was in response to extension caused by back arc basinal rifting (Chapter 1), a low pressure environment in which it may have been possible for direct exsolution of mafic derived metal and sulphur bearing fluids to be exsolved, in a similar fashion to mineralising processes found in other back arc settings, the East Manus Basin for example (Yang and Scott, 2002; Sun et al, 2004), or the Miocene-Pliocene Cu deposits of central Chile (Stern and Skewes, 2002). The next event considered here was the 1600Ma-1580Ma peak-metamorphic event in which there may have been potential for metamorphic fluids to sequester sulphide material from pre-emplaced mafic rocks, in a similar way to that suggested for the giant Mount Isa deposit in the Mount Isa Western Succession (Hannan et al, 1993; Heinrich et al, 1995) and for mineral deposits within the McArthur Basin, Northern Territory (Cooke et al, 1998). Finally, consideration is given to the ability of mafic magmas to contribute sulphur and metals, either directly or indirectly, in the widespread 1530Ma Williams-Naraku felsic-intermediate magmatic event in which exchange of sulphur and metals between intermingled mafic and felsic magmas may have resulted in the hydrothermal expulsion of those components, as suggested for the Bingham Canyon Cu-Au deposit (Hattori and Keith, 2001; Maughan et al, 2002).

In consideration of these observations, where the Williams-Naraku batholith hydrothermal fluids do not fully explain the sources of metals, sulphur and mineralising fluids, it is necessary to search for other sources of metals and sulphur for Eastern Succession deposits.

In light of these recent findings and the spatial relationship of mafic rocks and high density sub-surface material to IOCG mineralisation (Butera and Blenkinsop, 2004; Butera, 2004; Mustard et al 2005; see Chapter 4), we aim to test the following hypotheses of contribution of S and metals from mafic material to the overall IOCG sulphide accumulations within the Eastern Succession:

1) Were metals and sulphur bearing fluids exsolved from mafic magmas at different times?
2) Did metamorphic leaching of earlier mafic rocks contribute to the ores?
3) Did hydrothermal leaching of metamorphic rocks by Williams-aged fluids contribute to the ores? and
4) Did mingling and mixing of c. 1530 Ma mafic and felsic magmas promote metal and sulphur transfer into the ~1530Ma hydrothermal system.

Mafic Rocks of the Eastern Succession

The Eastern Succession refers to the eastern most portion of the Mount Isa Inlier, and is subdivided into the Mary Kathleen Fold Belt, including the Wonga Belt, in the west, and the Cloncurry district in the east. Major stratigraphic and magmatic sequences of the Eastern Succession include the calc-silicate and pelitic rocks, marbles and volcanic rocks of the 1760Ma-1730Ma Mary Kathleen Group (which includes the Corella Formation), and the 1690Ma-1620Ma Soldiers Cap Group of siliciclastic metasedimentary and mafic to intermediate extrusive rocks. Intrusive rocks include the early Wonga Granite and associated mafic rocks (1760Ma – 1730Ma), gabbros and dolerites emplaced early in the history of the Soldiers Cap Group deposition, and the Williams-Naraku batholith of felsic-mafic rocks emplaced ~1550-1490Ma.

The oldest mafic rocks exposed in the Eastern Succession are those of the ~1760Ma Marraba Volcanics (~1760Ma – 1740Ma), and the 1740Ma Lunch Creek Gabbro. These magmas may have been related to the ~1780Ma-1740Ma Wonga extensional event, in which voluminous bimodal magmatism occurred in and above the Wonga Belt within the Mary Kathleen Fold Belt (Holcombe et al, 1991; Oliver et al, 1991). The next major mafic magmatic event is constrained by a U-Pb SHRIMP age of 1686±8 Ma for tonalite intruding the Llewellyn Creek Formation of the Soldiers Cap Group in the Snake Creek Anticline, toward the eastern margin of the Eastern Succession (Rubenach, 2005). Tonalite sheets, lenses and small bodies are abundant within the sill-like intrusive complex. The tonalites generally preserve igneous textures, whereas the related mafic rocks, which include gabbro, layered gabbro and dolerite, have been largely converted to foliated hornblende-plagioclase amphibolites, only locally preserving igneous textures. Mingling/mixing relationships between tonalite and gabbro indicate coeval emplacement, so that the above age is inferred to be the age of intrusion of the mafic rocks.

SHRIMP zircon ages of 1658±8 and 1654±4 Ma have been determined for the Toole Creek Volcanics and Mt Norna Quartzite respectively, of the Soldiers Cap Formation (Page & Sun, 1998). Both these units overlie the Llewellyn Creek Formation which is intruded by the 1686 Ma tonalites, implying that there is a significant depositional hiatus between them. Similar ages for the nearby Ernest Henry Diorite (1660 ±13Ma, 1658 ±10Ma, 1657±7Ma; Pollard and McNaughton, 1997; Page and Sun, 1998), and an albitized granite near Cloncurry (1679±7; Pollard & McNaughton, 1997), all indicate significant igneous activity during deposition of the Soldiers Cap Formation. Currently available geochronological data precludes us from determining whether the ~1686Ma magmas and those of the ~1660Ma Toole Creek Volcanics were discrete events, or part of a single ~30my protracted igneous event. The bulk of the remaining mafic units in the south and central parts of the Eastern Succession also appear to be related to either the 1686Ma or 1660Ma magmatic events, based on similarities in geochemistry, magnetic response and stratigraphic position. The intrusion of these mafic dykes into the upper Mount Norna Quartzite is shown by Hatton and Davidson (2004) to be contemporaneous with the diagenesis of the sediments.

Other mafic magmatic episodes within the Eastern Succession have been interpreted to have occurred at ~1600-1580Ma and ~1530Ma. The 1600-1580Ma generation of mafic rocks are constrained to the axial plane of the Snake Creek Anticline, and are present as thin doleritic dykes, generally less than 100m in width.

Their syn- peak metamorphic (D_2) age are constrained by their cross-cutting nature of earlier mafics folded at this time. They are axial planar to these folds.

The final Mid-Proterozoic mafic magmatic event evident in the exposed portions of the Eastern Succession occurred at ~1530Ma. These are unfolitated gabbroic bodies that are intimately associated (mixed and mingled) with the ~1530-1500Ma Williams-Naraku Batholith of intermediate to felsic magmatic rocks (Page and Sun, 1998; Wyborn et al, 1998; Perring et al., 2000; Pollard et al., 1998; Mark et al, 2005; Rubenach, 2005).

IOCG Mineralisation, Eastern Succession

In order to better understand the subtle differences in Cu-Au mineralization styles, and to evaluate ore genesis processes and models, the IOCG mineralisation in the Eastern Succession has previously been catergorised into four broad groups, based on their general physio-chemical characteristics and associations with Fe-oxide rich rocks (Carew, 2004): 1) Fe oxide-rich rocks where sulphides are minor to absent; 2) Cu-Au mineralisation overprints earlier Fe oxide-rich rocks; 3) Cu-Au mineralisation and Fe oxide formation are synchronous; and 4) Cu-Au mineralisation is not spatially or temporally associated with significant Fe oxide.

Fe oxide-rich rocks (Category 1) with little or no Cu-Au mineralisation are common throughout the Eastern Succession. Examples of sedimentary Fe oxide-rich rocks occur (e.g. Monakoff and Fairmile; Davidson and Davis, 1997; Davidson, 1998), although some examples that have been proposed are controversial (Starra; Rotherham, 1997). Many Fe oxide-rich rocks in the EFB are interpreted to be metasomatic (Hitzman et al., 1992; Williams, 1994; Rotherham et al., 1998; Oliver et al., 2004). They typically occur as lenticular or vertical bodies associated with dilation within, or at intersections between, fault or shear zones (Hitzman et al., 1992; Baker & Laing, 1998; Laing, 1998; Marshall & Oliver, 2001).

The second category refers to pre-existing Fe oxide-rich rocks that are apparently overprinted by a later, not necessarily related, Cu-Au mineralising event. Deposits in this category potentially include Starra (Rotherham, 1997) and Osborne (Adshead, 1995). Olympic Dam and Emmie Bluff deposits in the Gawler Craton appear to show similar relationships (Oreskes and Einaudi, 1992; Gow et al., 1994). One of the most significant reported examples of this style of mineralisation in the Eastern Succession is the Starra deposit, which is unique in in that it has significantly higher Au:Cu ratios than the other deposits (Williams and Pollard, 2003). Fe oxide-rich rocks at Starra form two prominent ridges that are situated in a major N-S striking and steeply dipping shear active late in the deformational history of the region (Adshead-Bell, 1998). Economic Cu-Au mineralisation is confined to only one of these ridges and is referred to as the Western Ironstone. However, Au-only and Cu-only equivalents also exist and in some cases are not associated with Fe-oxides (Rotherham, 1997). Two paragenetic stages pre-dating Cu-Au mineralisation are recognised and include early widespread Na-Ca alteration (albite, quartz, scapolite, actinolite), and localised K-Fe alteration (biotite, magnetite, hematite, quartz, pyrite), with the latter responsible for the formation of the Western Ironstones. Typical mineral assemblages associated with Au-Cu mineralisation include pyrite, gold, chalcopyrite, barite, hematite, calcite, anhydrite and magnetite (Rotherham, 1997). The Au-Cu mineralisation has previously been interpreted to have formed via the brecciation and subsequent hematisation of previous magnetite-rich rocks by their interaction with oxidised fluids (Rotherham et al, 1998). The source of Cu, Au and S remains uncertain, although Williams et al (2001) identified highly complex fluid inclusions associated with mineralisation at Starra and speculated that fluid mixing may have contributed to ore genesis, rather than fluid-rock interaction alone. The Osborne deposit most likely represents the other major deposit of this type in the Eastern Succession. The deposit is hosted by Proterozoic metamorphic and igneous rocks. The host rocks are dominated by Na-rich feldspathic psammites and amphibolites, and early Fe oxide-rich rocks. Regional-scale faults are thought to have acted as conduits for the fluids responsible for economic Cu-Au mineralisation, while reverse movement on biotite shears are believed to have provided structural traps for the ore-bearing fluids (Harris, 1997). Mineralisation at Osborne is divided into two discrete domains: the western domain containing two substantial Fe oxide-rich units, and the eastern domain, which is largely devoid of Fe oxide-rich rocks (Adshead, 1995). The ore mineral assemblage at Osborne comprises of massive silica flooding, chalcopyrite, hematite, magnetite and pyrrhotite as well as quartz, apatite, chlorite, talc, magnetite, chalcopyrite and pyrite within magnetite-rich breccia. The assemblages differ between domains and highlight the possible role played by previous Fe oxide-rich rocks in the precipitation of the Cu-Au mineralisation. In particular, Cu-Au mineralisation in the eastern domain contains more reduced associations of pyrrhotite-magnetite ± pyrite compared to the more oxidized hematite-magnetite-pyrite altered Fe oxide-rich rocks of the western domain (Adshead,1995).

Category 3-type IOCG mineralization includes deposits in which Cu-Au and Fe-oxides appear to have precipitated contemporaneously. Deposits of this type include Ernest Henry, the largest Cu-Au deposit in the Mount Isa Block (Ryan, 1998; Mark et al., 2000), and the Mt Elliott deposit (Little, 1997; Drabsch, 1998). The Ernest Henry ore body is predominantly hosted in felsic to intermediate metavolcanic rocks originally composed of fine- to medium-grained plagioclase phenocrysts in a finegrained plagioclase-rich groundmass (Mark et al., 2000). Other rock types found within and adjacent to the Ernest Henry deposit include metasedimentary rocks (calc-silicate rocks and pelitic schists) and metadiorite. The latter occur to the northwest and south of the deposit and have U-Pb titanite crystallisation ages of 1660-1650 Ma (Pollard and McNaughton, 1997). They were metamorphosed to amphibolite facies and contain hornblende, plagioclase, magnetite, quartz and rare K-feldspar (Mark et al., 2000).

Cu-Au mineralization at Ernest Henry was associated with two distinct events. The first, and major, ore-forming event was associated with brecciation, with the matrix largely composed of magnetite, calcite, pyrite, biotite, chalcopyrite, K-feldspar, titanite and quartz. The second event is similar in mineralogy, but is contained in a network of veins that cut the earlier mineralised breccias (Mark et al., 2000).

Cu-Au mineralisation at Mount Elliott is hosted within multiply deformed and extensively skarn-altered metasedimentary rocks and amphibolite of Paleoproterozoic age (Little, 1997, Wang and Williams, 2001). The development of skarn and Cu-Au mineralisation occurred synchronously with movement along NE-dipping brittle reverse faults (Little, 1997, Wang and Williams, 2001). Magnetite is associated with pyrrhotite and chalcopyrite within the amphibolites in the lower zone. In contrast, Cu-Au mineralisation hosted in metasedimentary rocks is typically magnetite poor (Little, 1997; Wang and Williams, 2001).

Category 4-type IOCG mineralization refers to deposits where Cu-Au mineralisation is not closely spatially associated with significant Fe-oxides. These deposits are more typically associated with dominant sulphides (pyrite and pyrrhotite). This style of deposit includes Eloise (Baker, 1998), Mount Dore and Greenmount IOCG deposits (Krcamrov and Stewart, 1998; Laing, 1998). The Eloise Cu-Au deposit is hosted in meta-arkoses, quartz-biotite schist and amphibolite within a dilational structural that has been interpreted as the major conduit for Cu-Au-bearing fluids, in which alteration and mineralisation was synchronous with ductile-brittle deformation. Baker and Laing (1998) suggested that Cu-Au mineralisation was synchronous with the waning stages of the Isan orogeny and emplacement of the Williams and Naraku Batholith (note however these two events have more recently been dated as being ~ 60 m.y. apart). The mineralization is associated with highly strained and altered rocks that form part of the Eloise Shear Zone and are largely composed of chalcopyrite, pyrrhotite, minor magnetite and pyrite (Baker, 1998). Baker (1998) and Carew (2004) postulated that the deposition of pyrrhotite at Eloise instead of iron oxide observed at many of the other IOCG deposits in the district may be a reflection of the composition and redox state of the host rock - carbonaceous shales and other metasedimentary rocks at Eloise may have inhibited the deposition of iron oxides.

Although there is a variation in the association of Cu-Au mineralisation with Fe-oxides, most IOCGs in the Eastern Succession share some common characteristics. They most often occur in dilational sites within shear zones (Adshead, 1995; Rotherham, 1997; Adshead-Bell, 1998; Baker and Laing, 1998; Baker, 1998; Mark et al., 1999; Marshall, 2003). Most deposits record an earlier period of Na-Ca alteration followed by later potassic-iron alteration (Adshead-Bell, 1998; Baker,1998; Mark et al, 1999; Oliver et al, 2004). All deposits are associated with both CO2 and hypersaline fluid inclusions which has been interpreted to represent unmixing of a H2O-CO2-salts fluid (Pollard, 2000) or fluid mixing (Mark et al, 2000; Williams et al., 2001; Oliver et al., 2004). The Cu-Au systems exhibit overlapping calculated $\delta^{18}O$ (+7 to +11 ‰), $\delta^{34}S$ (-3 to +3 ‰) and $\delta^{13}C$ (-10 to -3 ‰) fluid compositions, suggesting a dominant magmatic component diluted by external fluid input and/or variable host rock interaction (Davidson and Dixon, 1992; Adshead, 1995; Twyerould, 1997; Rotherham et al., 1998; Mark and Crookes, 1999; Mark et al., 2000; Baker et al., 2001; Oliver et al., 2004; Marshall et al., 2006). On the other hand, some of the variations in the physico-chemical properties in the deposits have been attributed to change in the composition or oxidation state of source intrusions, changes in the conditions of ore formation (T, P, fO_2, fS_2, fluid salinity, and pH), varying degrees of fluid mixing (Adshead, 1995; Little, 1997; Baker, 1998; Rotherham et al., 1998; Mark et al., 2000; Williams et al., 2001; Oliver et al., 2004) and influence of wall/host rock geochemistry (Williams and Pollard, 2003; Oliver et al, 2004; Williams et al, 2005). The differences in these properties may reflect polyphase ore genesis, and perhaps the involvement of fluids other than those derived from the Williams Batholith. Hence, the study of the potential for mafic rocks and magmas to influence IOCG genesis is warranted.

Geochemistry-petrography

Data

Geochemical data on mafic rocks was gathered in order to attempt to constrain the possible role of the mafic rocks in IOCG genesis. Wholerock XRF and ICP-MS major and trace element data for the 1686Ma, ~1600Ma and ~1530Ma generations of mafic magmas were obtained for this study, analysed at the Advanced Analytical Centre

(James Cook University). S, Cu and Au were analysed on high precision instrumentation at SGS Analabs Townsville (50g Fire-Assay and ICP-OES; S detection limit 50ppm, Cu detection limit 5ppm, Au detection limit 1ppb). These results were combined with complementary data for the 1686Ma and 1660Ma (Toole Creek Volcanics) events from the Geoscience Australia Ozchem Database (www.ga.gov.au), and deposit related amphibolite data from Baker (1996) and Oliver et al (2004). Most pre- 1530 Ma samples were affected by at least partial amphibolitisation during peak metamorphism, and some have been weakly altered by the ~1530Ma hydrothermal event.

1686 Ma mafic rocks of the Snake Creek anticline and Hampden syncline were metamorphosed to low-mid amphibolite facies, and typically contain secondary amphiboles, plagioclase, minor remnant clinopyroxene, rare orthopyroxene and primary hornblende, and minor interstitial quartz, magnetite, ilmenite-titanomagnetite and both primary (chalcopyrite, pyrite, nickeliferous pyrite and rare pyrrhotite)and secondary sulphides (pyrite, chalcopyrite) (Fig.2 a). The syn-metamorphic 1600Ma mafic rocks share the same petrologic characteristics as the earlier generation, but they are more variably metamorphosed and more commonly tend to preserve their igneous textures (Fig. 2b). In rare cases, primary igneous amphiboles are observed (Pers. Comm. M. Rubenach, 2004). The 1530Ma (Fig. 2c) mafic rock samples studied by electron microprobe (Advanced Analytical Center, James Cook University) have undergone high degrees of alteration, and are typically scapolitised, amphibole is Cl-rich, and plagioclase has been mostly sericitised. Minor epidote veining accompanies some secondary magnetite-sulphide precipitation. Unaltered mafic rock samples of the 1660Ma Toole Creek Volcanics in the Weatherly Creek syncline, have been described by Davidson (1998) as containing actinolite, plagioclase and titanite with minor chalcopyrite, pyrite, pyrrhotite and chlorite.

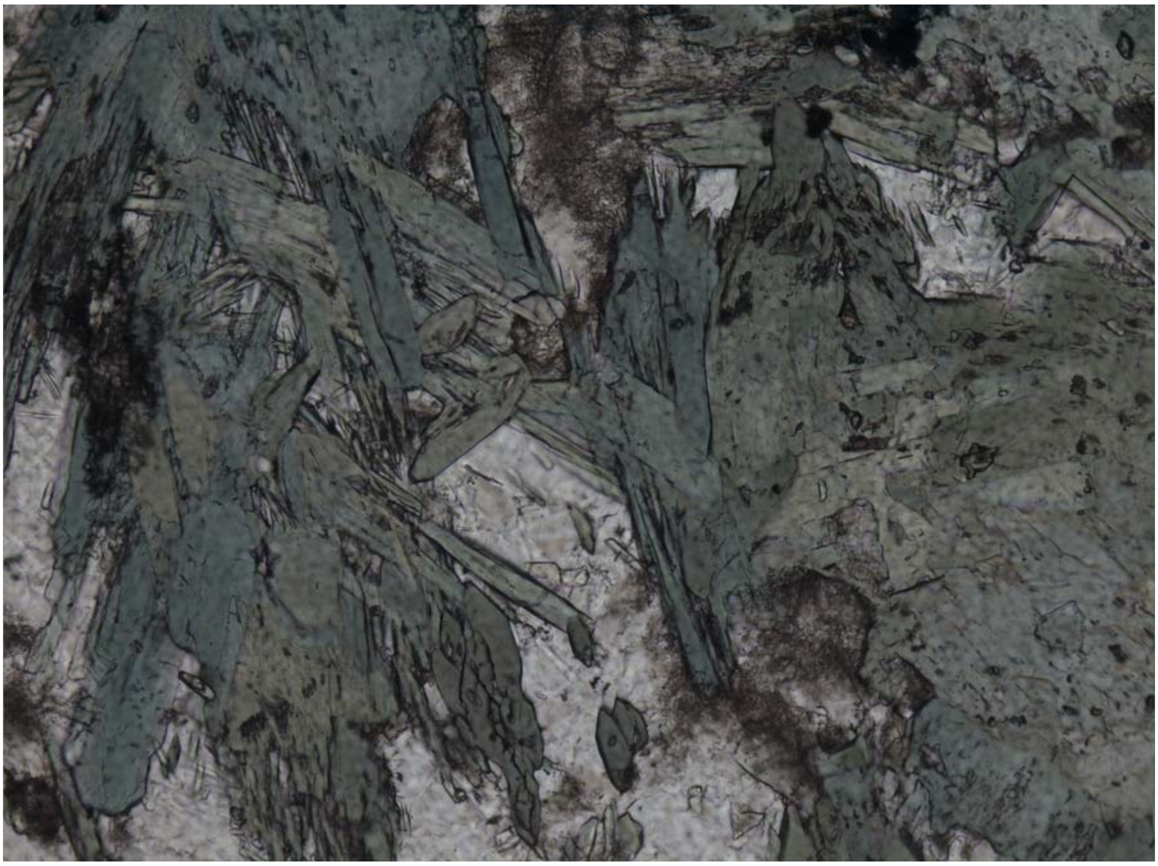


Figure 2a). Typical 1686Ma dolerite (amphibolitised during peak metamorphism at ~1600-1590Ma), Snake Creek Anticline. Actinolite (dark green) and other Cl-amphiboles replacing primary clinopyroxene and overprinting sericitised feldspar, primary magnetite and sulphides (black globules interstitial to minor quartz). Mildly metamorphically recystallised. 10x Leica - Plane Polarised Light. 1.4 x 1.1mm view. Sample M12.

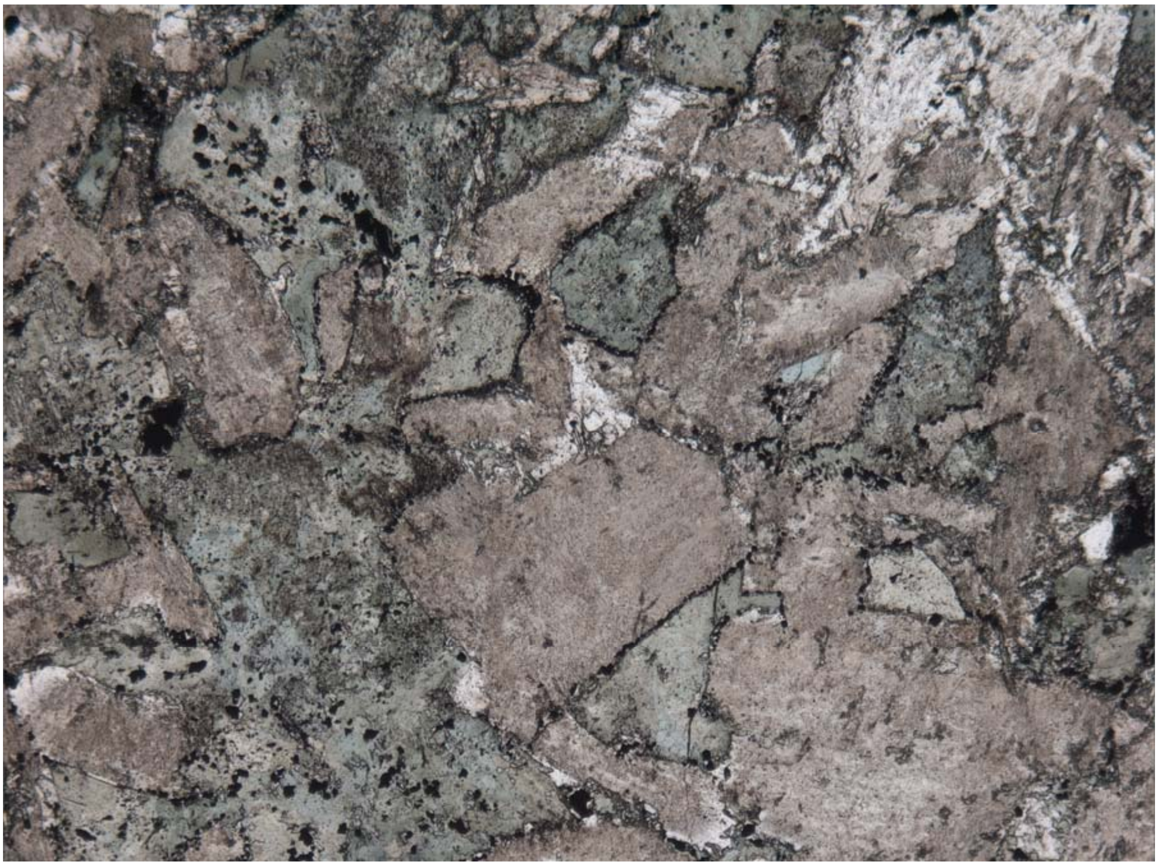


Figure 2b). Typical ~1600Ma dolerite retaining primary igneous texture, Snake Creek Anticline. Mildly sericitied feldspar, minor clinopyroxene partly replaced by amphibole, primary magnetite and sulphides (black globules interstitial to minor quartz and clinopyroxene). 5x Leica - Plane Polarised Light. 2.8 x 2.1mm view. Sample T11.

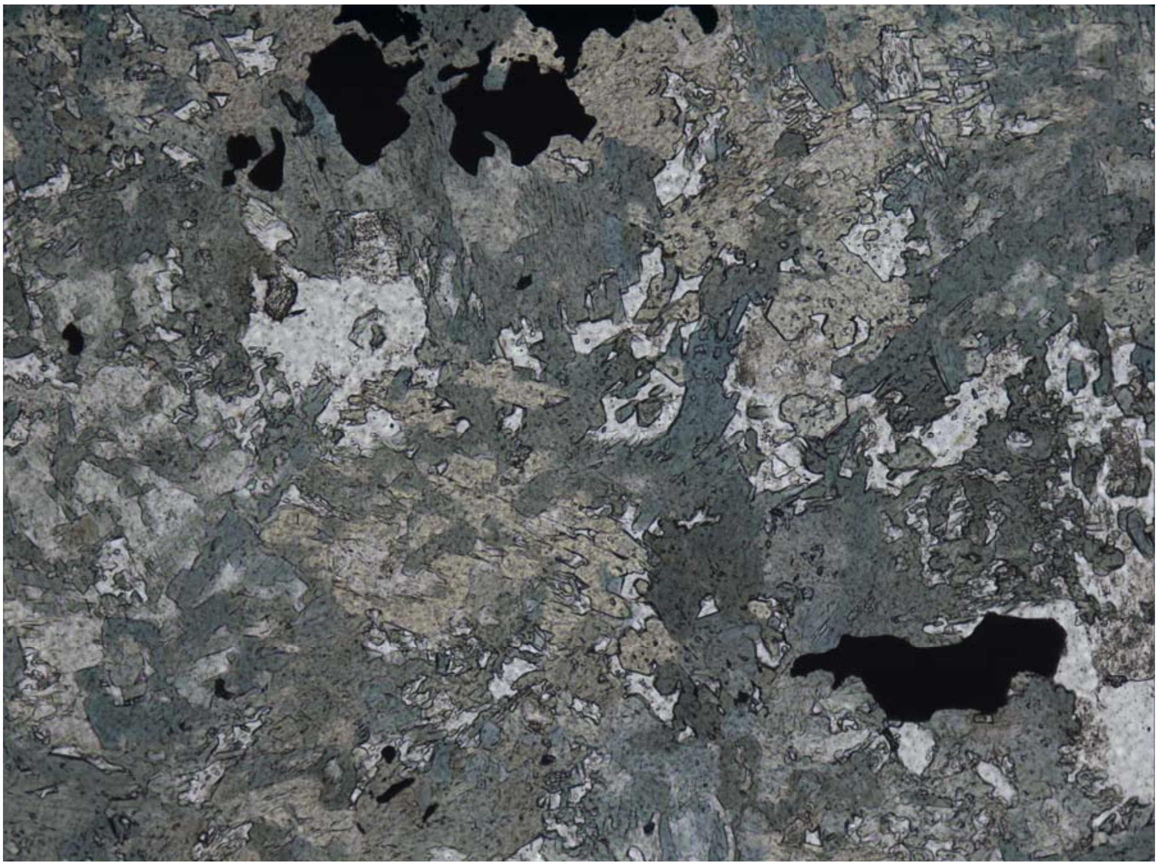


Figure 2c). Typical ~1530Ma gabbro, altered. Cloncurry Fault, west of Snake Creek Anticline. Extensively altered to amphibole-sericited feldspar, minor scapolite, quartz and chlorite, secondary magnetite and pyrite. 5x Leica - Plane Polarised Light. 2.8 x 2.1mm view. Sample T19.

Geochemically, the mafic rocks of different ages are very similar (Chapter 1). They all exhibit a typically strong fractionation, with high total Fe in the range of 11-20wt%, and this has been interpreted as a primary igneous feature (Chapter 1; Williams, 1998b). Alteration is commonly, but not always, indicated by Na_2O > 3.5wt%, and K_2O > 2wt%, and these elements have been used to filter the data in order to minimise erroneous data.

Secondary S and Metal Trends – Metamorphism

Most pre- to syn-metamorphic mafic rocks in the Eastern Succession have undergone textural changes from primary igneous texture, through to partly and fully metamorphically recrystallised textures. The dolerite dykes of the ~1600Ma generation of mafic magmatism present an excellent means of testing the ability of metamorphism of pre- or syn- intrusive mafic rocks to modify their composition, particularly their S and metal contents. In some areas of Snake Creek, the same dyke has both preserved igneous and strongly recrystallised textures. Figure 3 is an isocon plot (Grant, 1986) of an average of five igneous textured and five metamorphically textured samples from the same set of dykes, showing how the geochemistry of these rocks changes during amphibolitisation.

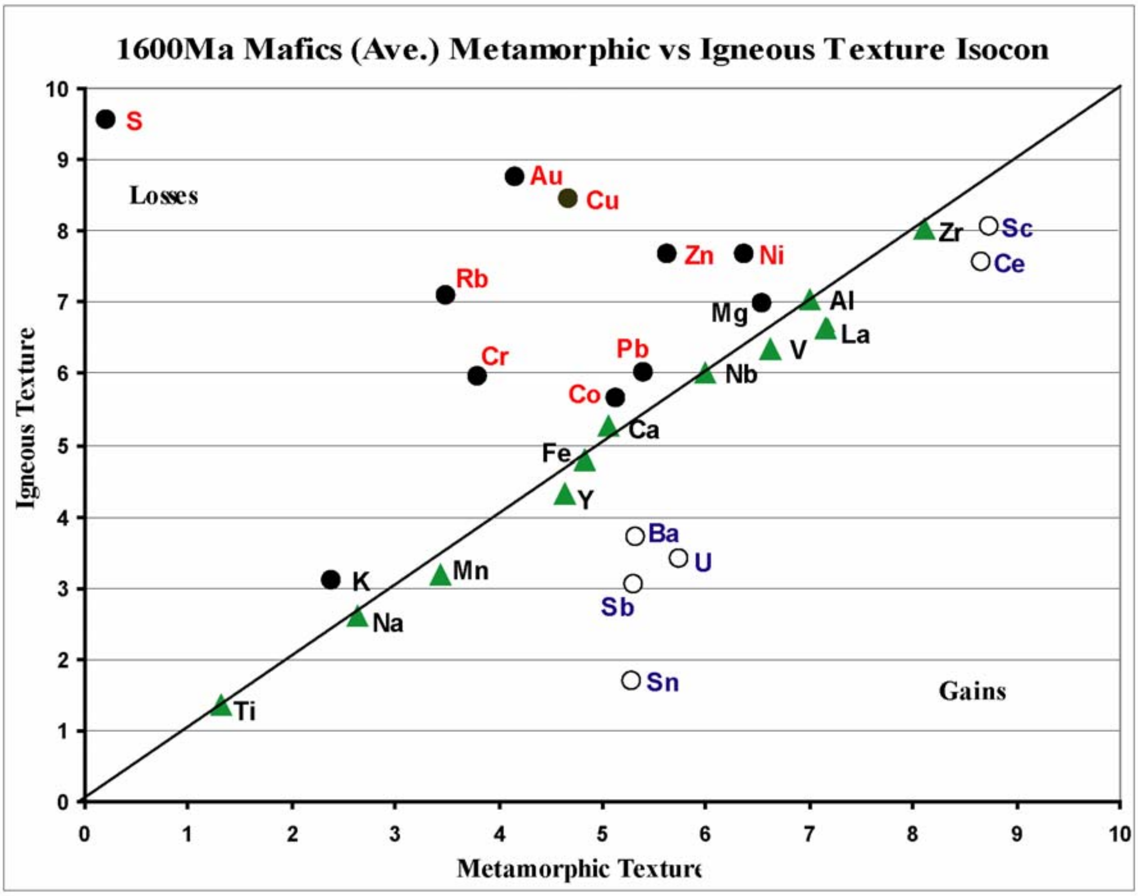


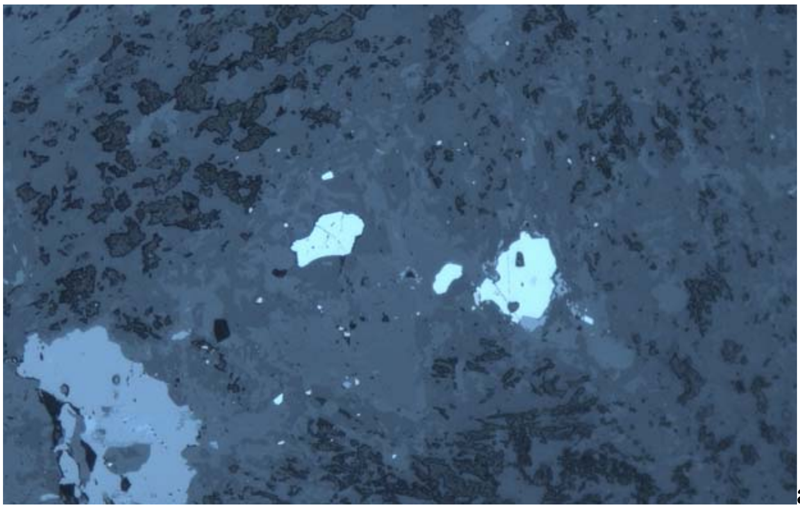
Figure 3. Isocon plot, after Grant (1986), (with individual elements multiplied by factors which distribute them from 0 to 10) of average geochemical analysis for elements of igneous textured vs metamorphic textured dolerites from the Snake Creek Anticline. Dykes inferred to be emplaced near the peak of the Isan Orogeny at ~ 1590 Ma from the Snake Creek Anticline. Average data with 2□ standard deviation compares 6 igneous-textured mafic rocks from the core of the dykes with 7 amphibolitic equivalents from the dyke margins (author's data, Appendix I,II), showing the leaching of S, Cu, Au, Zn, Ni, Cr, Rb and addition of Sn, Sb, U, Ba with the infiltration of metamorphic fluids. Note also the immobility of Fe during metamorphism. The multiplication factors for the various elements are: Ti, Al/2, Fe/3, Mg, Ca/2, Na, 3K, Sc/5, Ba/30, V/50, Cr/20, Mn/500, Co/10, Ni/12, Zn/12, Pb/5, Rb/12, Sr/20, Y/6, Zr/10, Nb, 3Sn, 10Sb, La, Ce/2, 10U, 2500Au, Cu/15, S/150. Standard deviations given in Table 1.

The results demonstrate that Zr, Y, Ti and Fe are immobile, while S, Cu and Au are dramatically reduced in the metamorphosed samples, implying that infiltrating metamorphic fluids were extremely effective in leaching these components from mafic rocks in the Eastern Succession at ~1600Ma-1580Ma. Zn, Ni, Co and Cr were also depleted by this process, while Ba, U, Sn and Sb were added to the mafic rocks.

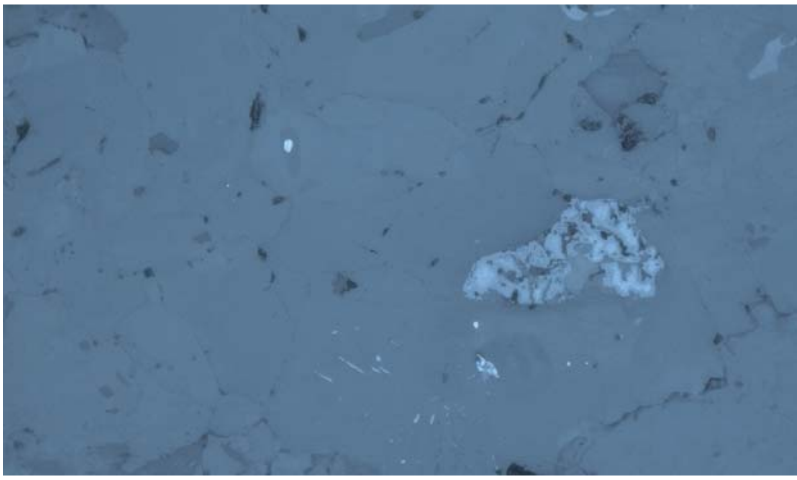
In a more detailed look at the petrochemistry of the mafic rocks, the S and metal contents of individual samples were compared with their texture (Table 1). The samples were broken down into the following groups: A) those that retained their primary igneous texture, or have not undergone any metamorphic recrystallisation, B) metamorphosed and partly recrystallised, and C) completely metamorphically recrystallised. The results show a consistent decrease in S, Cu and Au with increasing degrees of metamorphic recrystallisation, with an average of 1074 ppm S, 162ppm Cu and 10ppm Au in igneous textured samples, and 12ppm S, 47ppm Cu and 1ppb Au in the metamorphically recrystallised samples. The change in sulphide content of dolerites and their amphibolites are highlighted by photomicrographs in Fig 4 (a,b).

Texture	Sample	S	Cu	Au
	(detection)	50ppm	5ppm	0.001ppm
Igneous	T15	1420	128	b.d
	T14A	1420	137	0.007
	T12B	1530	101	b.d
	M9	1480	166	0.013
	T12A	1370	141	0.007
	M8	430	121	0.008
	T1	945	138	0.017
	T2	1540	201	0.027
	M13	1320	234	0.011
	M1	390	211	0.010
	M2	321	132	0.009
	M14	720	230	0.009
	Average	**1074**	**162**	**0.010**
	s.d.	**483.3**	**45.6**	**0.007**
Metamorphic partly recrystallised	M12	440	101	0.011
	M7	285	92	0.008
	T14B	85	103	b.d.
	T10	110	84	0.007
	T8	950	145	b.d.
	Average	**374**	**105**	**0.007**
	s.d.	**35.6**	**23.6**	**0.005**
Metamorphic recrystallised	T3	60	b.d.	b.d.
	T17	b.d.	152	0.003
	T9	b.d.	31	b.d
	T16	b.d.	24	b.d
	T11	b.d.	26	b.d
	Average	**60**	**47**	**0.001**
		26.8	**60.1**	**0.001**

Table 1. Geochemistry versus petrography: concentration of S, Cu and Au as a function of the degree of metamorphic recystallisation of Mount Isa Eastern Succession mafic rocks. Igneous textured mafic rocks that preserve some primary pyroxene typically contain substantially more S, Cu and Au than their amphibolitised equivalents. Full dataset supplied in Appendix I and Appendix II. In calculations, b.d. levels are treated as 0.0. Visual QA/QC checks were made on data, and a review of internal lab checks were made.



a)



b)

Fig 4 a and b) Reflected light photomicrograph of a dolerite (a) vs amphibolitised equivalent (b) from Snake Creek Anticline showing the presence of abundant Fe-oxides, pyrite and chalcopyrite in the dolerite, and absence of those phases in the amphibolite, suggesting the destruction and leaching of sulphide components during metamorphism. Scale 2.8 x 2.1mm.

Secondary S and Metal Trends – Syn-Williams Batholith (~1530Ma) Alteration

After examination of the geochemistry of Syn-Williams hydrothermal fluid altered mafics, it appears that this alteration episode did not result in clear enrichments or depletions of key metals and sulphur. Scapolite altered samples typically contain both primary (interstitial to primary minerals) and secondary Fe- and Cu- sulphides (associated with Cl-amphiboles, reprecipitated magnetite, and minor hematite), but the petrography does not allow for the determination of whether new sulphide material was introduced, or whether pre-existing sulphides or metals held in primary magnetites and pyroxenes was remobilised locally. Geochemically, there are no significant chemical differences between altered and unaltered samples, suggesting that within the mafic rocks, either the conditions were not suitable for sulphide precipitation contemporaneous with Williams-Naraku batholith hydrothermal fluid flow, or more likely, metals and sulphur were neither introduced, nor depleted by these fluids, but rather the fluids remobilised pre-existing sulphides on a micro to local scale. Amphibolite data from Baker (1996) for a dolerite and a strongly albitised equivalent proximal to the Eloise Cu-Au deposit, however shows no major loss of Cu, but moderate losses of Co, Ni, Zn, Fe and V (Oliver et al, 2004). However, it must be noted that these samples come from within the near mine environment, and the data should not be considered to necessarily reflect typical regional values. Nevertheless, a 7.3wt% reduction of Fe_2O_3T from amphibolites at Eloise, and similar depletions in mafic rocks in other Eastern Succession immediate ore environments may be a significant contributor of Fe to the IOCGs systems (Adshead, 1995; Syna, 2000; Carew, 2004; Oliver et al, 2004).

Primary S and Metal Trends

In the endeavour of trying to relate S and metal contributions to the crust and mafic magmatism, primary fractionation trends for S and metals (Cu, Au) in the 1686Ma and 1660Ma mafic rocks were determined by plotting them against total Fe as Fe_2O_3T (Fig. 5a-c), as total Fe has been established as a primary igneous feature, as mentioned above, immobile during metamorphism and (but not during late alteration) in the Eastern Succession (Williams, 1998b; Foster, 2004, Oliver et al, 2004). Plots for S, Cu and Au versus Fe_2O_3T were compared to Fe_2O_3T versus immobile elements

Y, Zr, TiO_2 (Fig 5d-f) from the 1600Ma generation of mafic rocks. The immobile elements show a consistent increase with fractionation, as would be expected for incompatible elements within a fractionating melt. Pb is variable, reflecting the strong mobility of the element, and shows no systematic trend with respect to fractionation. S, Cu, and Au however, typically show a trend of initial increase in concentration, followed by a subsequent semi-linear decrease, in a manner contrary to the hydrothermally immobile elements. This trend is defined by the general uppermost data points, and does not coincide with the degree of metamorphism or alteration, but it is a primary igneous trend. The effects of metamorphism are interpreted here to decrease the S and metal values at constant Fe_2O_3T, and alteration may also affect the data (minor increase or decrease) with respect to S and metal, but not Fe. Zn, Cr, Co and Ni share similar trends to the metals and sulphur in these samples.

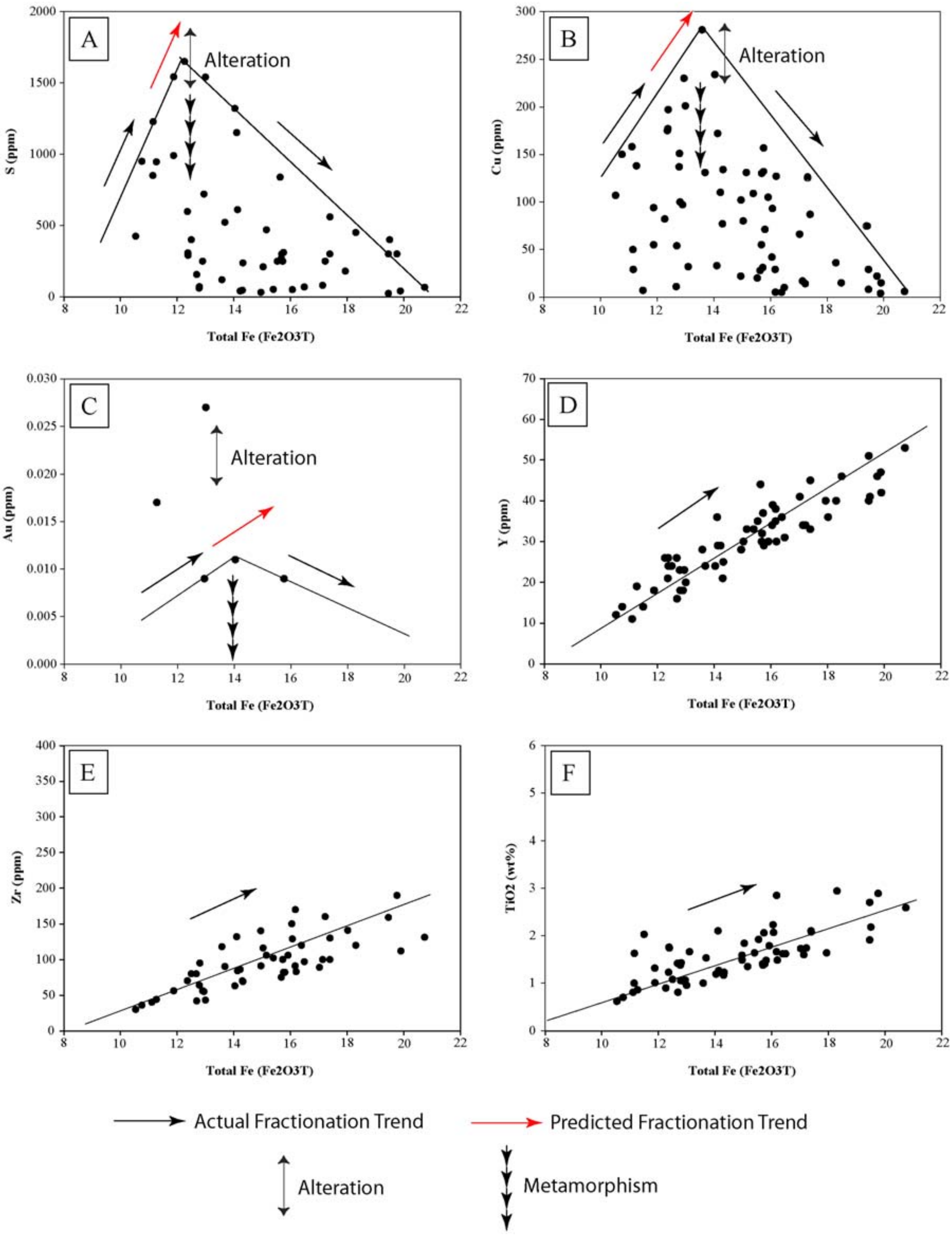


Figure 5a-f. Primary fractionation trends (visually estimated; black lines) for S, Cu, Au, Y, Zr, TiO2 versus total Fe (Fe_2O_3T) for 1686Ma-1660Ma mafic rocks of the Eastern Succession. Black arrows indicate observed fractionation trend, while red arrows indicate predicted trends for the elements in a fractionating tholeiitic melt. Alteration and metamorphic vectors are also shown. S, Cu and Au tend to decrease in abundance after an initial increase, while immobile elements increase throughout the fractionation process. Data collected by author, and also drawn from the Geoscience Australia Ozchem database. Samples for Au from author are igneous textured, non-altered (based on K, Na) samples only.

On the assumption that IOCG deposit related amphibolites and those studied here for the 1686Ma and 1660Ma generation of mafic rocks in the Soldiers Cap Group, are chemically and genetically similar (Chapter 1), it is interesting to note that the average total Fe (Fe2O3T) content for the non-deposit related mafics is approximately 14wt%, while the deposit related amphibolites are typically 15-16wt% Fe_2O_3T (more fractionated) (Baker, 1996; Adshead, 1995; Syna 2000; Wang and Williams, 2001).

Discussion

The initial increase followed by decreases in the concentration of S and metals in the progressively fractionated mafic melt presents an interesting scenario. Decreasing elements in a fractionating tholeiitic melt can be interpreted in a number of ways. Firstly, it may represent leaching of elements with alteration processes that add Fe to the rock, discounted here because we know that Fe is immobile in these rocks. Secondly, orthomagmatic crystallisation of primary sulphides or metal- and sulphur-rich phases dropping out of the fractionating melt into the basal parts of the magma chamber (i.e. cumulates) could account for the observed trends in the upper, cumulate depleted parts of the intrusions. Finally, the expulsion of a S and metal rich fluid phase from the magmatic system could also explain the trends. More clearly, that fractionation towards a S-metal rich fluid might lead to accumulation of these in a fluid phase, that when released upon crystallization would reduce the S and metal content of the residual melt.

The geochemical nature of the 1686Ma and 1660Ma mafic magmas has been used by Butera et al (in prep; Chapter 1) as evidence for fractionation in a back arc basinal environment at pressures between 3 and 5kbar (11-18km depth). Both the thermodynamic modelling of primary hydrous and CO_2 rich Fe-picrite in pMelts Software (Ghiroso, 2002), and the presence of primary igneous amphiboles in the mafic rocks, suggests these mafic rocks were H_2O bearing, providing a means for separation of an H_2O and CO_2 bearing phase. If cumulate sulphides and oxides had descended into the basal parts of the mafic magma chambers in the amount necessary to explain the loss of the elements as observed in remaining mafic rocks, large portions of the mafic magma chambers in the Eastern Succession should contain sulphide or Fe-oxide cumulates. Despite ~200My of repeated thrusting and folding in the region, exposing many structural levels, sulphide cumulates are not observed in any mafic plutons, even in the exposed layered plutons of Snake Creek. Further, experimental work on sulphur content at sulphide saturation in basic magmas by Mavrogenes and O'Neil (1999), would suggest that it would be relatively improbable for such high level crystallising mafic melts (3-5kbar) to ever reach sulphur saturation, and hence precipitation of orthomagmatic sulphides is unlikely at these pressure conditions. Observations of primary magnetite and Fe-, Cu- and Ni-sulphides in the mafic rocks is always interstitial to other minerals, as the latest phase of crystallisation, and we interpret these primary Fe-oxides and sulphides as reflecting the composition of an Fe-S-metal (Cu, Au, Zn, Co, Ni)-H_2O-CO_2 volatile phase that separates from the residual melt at the final stages of mafic rock crystallisation. The more fractionated the magma, and the higher the total Fe content, the more H_2O is available to transport the S and metals out of the system, reflecting the decrease in the elements after an initial consolidation of metals and sulphur in the less fractionated melt. Similar interpretations for S and metal (Ni, Cu, Zn and Fe) exsolution from mafic magmas have been made for the East Manus back-arc basin (Yang and Scott, 2000), and for mafic-intermediate magmas also at East Manus (Sun et al, 2004). Stern and Skewes (2002) discuss the mafic derived fluids contributing to the Cu deposits of Central Chile, and propose a strong association with these fluids and the contribution of metals the deposits. Thus, during the fractionation and crystallisation of mafic magmas in the Eastern Succession, high levels of S, Cu, Au, Zn, Ni and Co were exsolved out of mafic magmas, during the 1686Ma-1660Ma (and perhaps the ~1600Ma event), either into the local roof zones of the magma chambers, or along active extensional faults, such as the strongly mineralised Mount Dore Fault, noted for its abundance of IOCG, Cu and Au mineralisation and proximal mafic rocks.

Later, peak-metamorphic (~1600Ma) fluid infiltration and scavenging of sulphur and metals from mafic rocks has been demonstrated to be of great significance. In the progressive metamorphosis of amphibolitisation of a primary mafic rock (mid-upper greenschist facies) to a completely metamorphically recystallised equivalent (upper amphibolite facies), (presumably from the moderately Fe-enriched magmas that retained the bulk of their S, Cu and Au during fractionation) over 90% of the sulphur is leached along with ~65% of initial copper and 90% of the gold. Because the IOCGs sit in zones of variable metamorphic grade and irregular amphibolitization of mafic rocks across the Eastern Succession, it is difficult to quantify the amount of S, Cu and Au leached from mafic rocks and subsequently contributed to ore systems. However, most deposit related mafic rocks have undergone metamorphism to at least lower amphibolite grade (Adshead, 1995; Baker, 1996; Foster, 2004) and up to upper amphibolite facies at Osborne (Sayab, 2005), and as such it is reasonable to assume that these rocks were leached of significant amounts of ore components. It is not possible to directly measure elemental losses in the near mine environment due to the overprinting and remobilising effects of alteration. In a similar fashion, peak-metamorphic scavenging of metals from the Eastern Creek Volcanics in the Mount Isa Western Succession has been interpreted to have supplied copper to the massive Mount Isa deposit (Hannan et al, 1993; Henrich et al, 1995).

Our favored interpretation, based on a number of critical pieces of evidence and supported by experimental S and metal solubility studies in basalts, favors the exsolution of a S and metal rich volatile phase from crystallising mafic bodies at 3-5kb. The possibility also remains that mafic intrusives (gabbroic bodies), contemporaneous with the Williams-Naraku magmatic event exsolved S and metals in a similar process to that of the 1686Ma/1660Ma events, however further data is needed in order to test this. Figures 6a-c summarizes how mafic magmatism may have been involved in the contribution of S and metals to IOCG deposits.

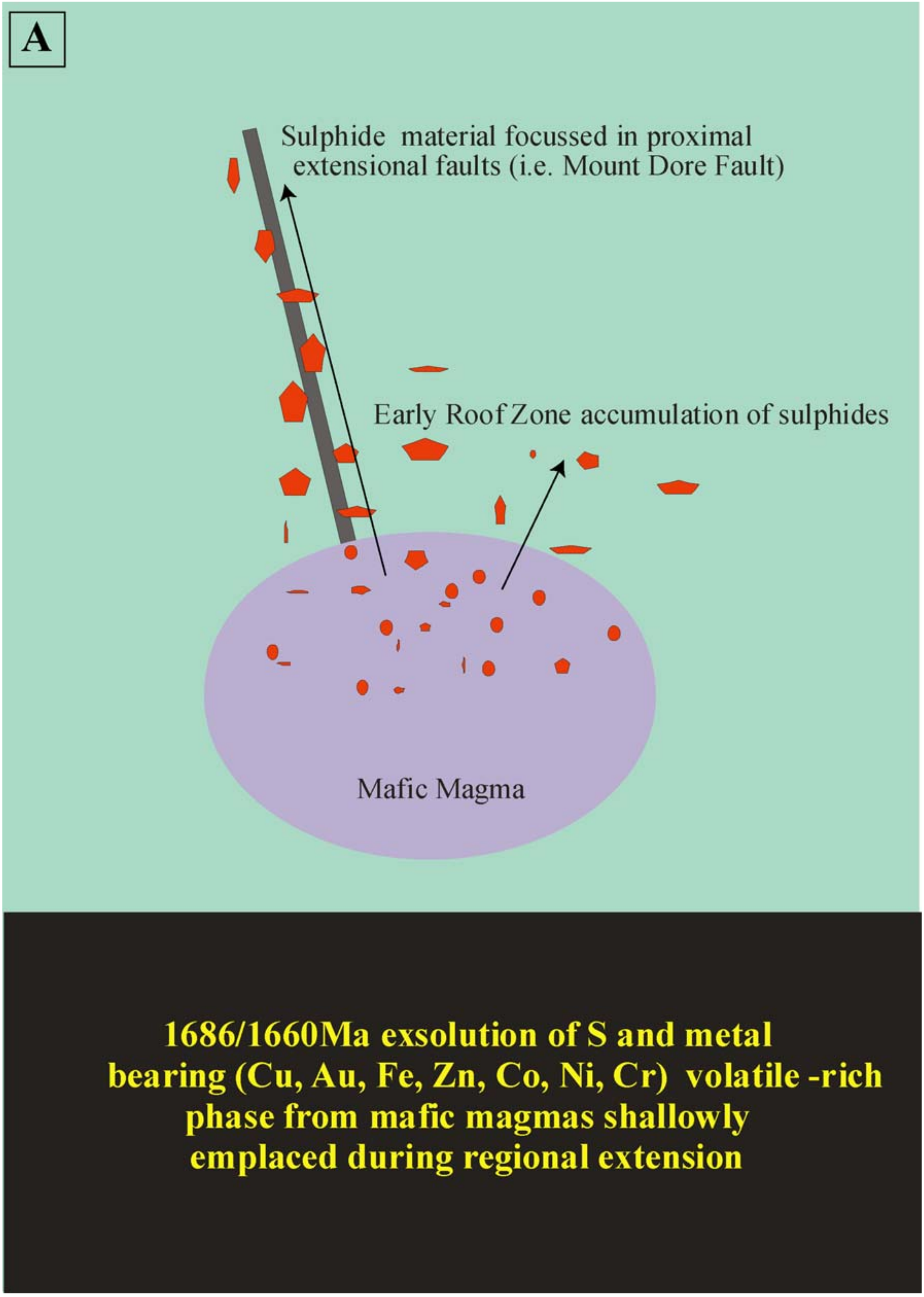


Figure 6a. Schematic interpretation of the process of S and metal exsolution from crystallizing mafic magmas at 1686Ma – 1660Ma, focused into active extensional faults and overlying roof zones.

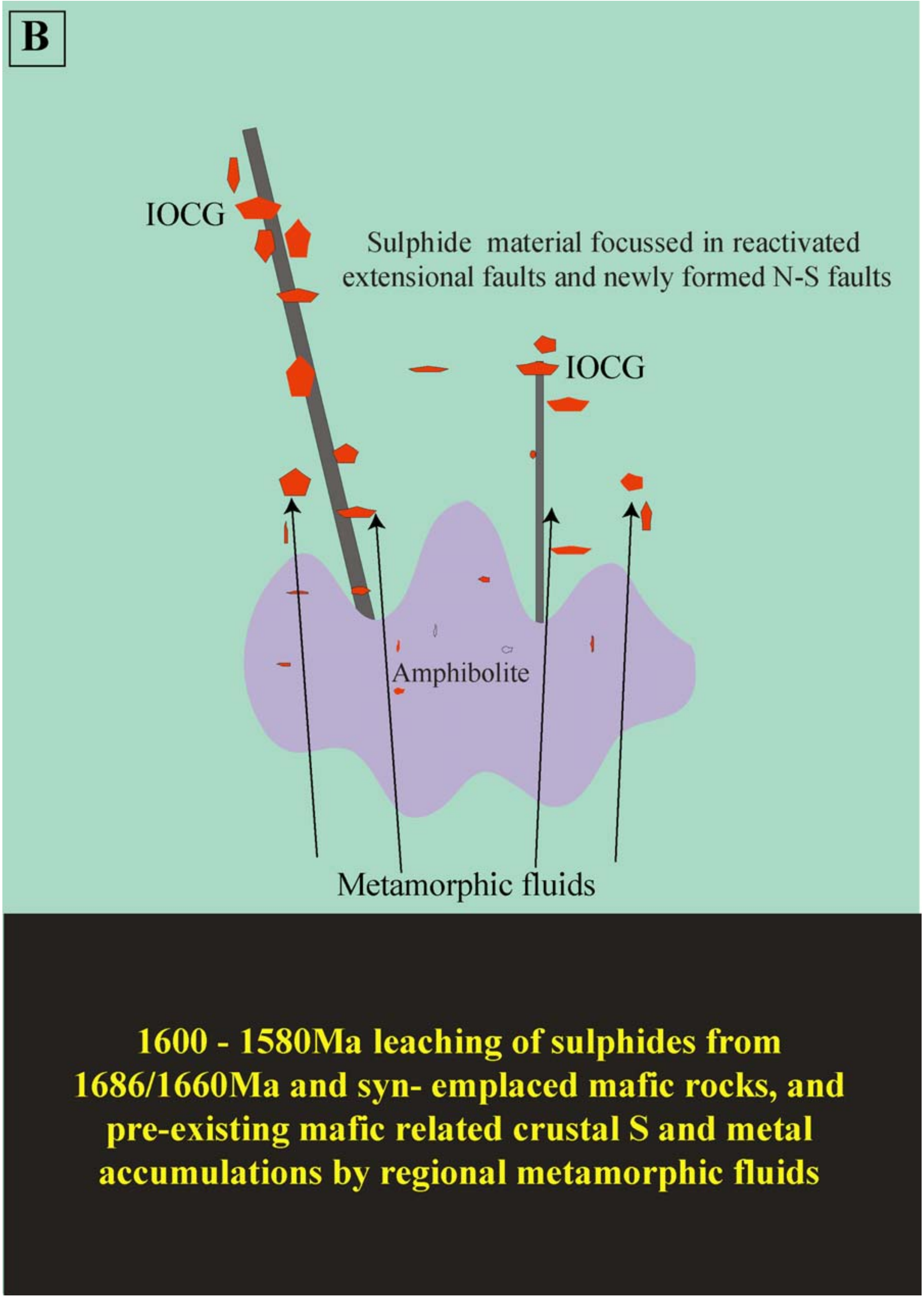


Figure 6b. Schematic interpretation of the process of S and metal leaching pre-emplaced mafic rocks and mafic derived crustal sulphide accumulations during Isan peak-metamorphism at 1600-1580Ma.

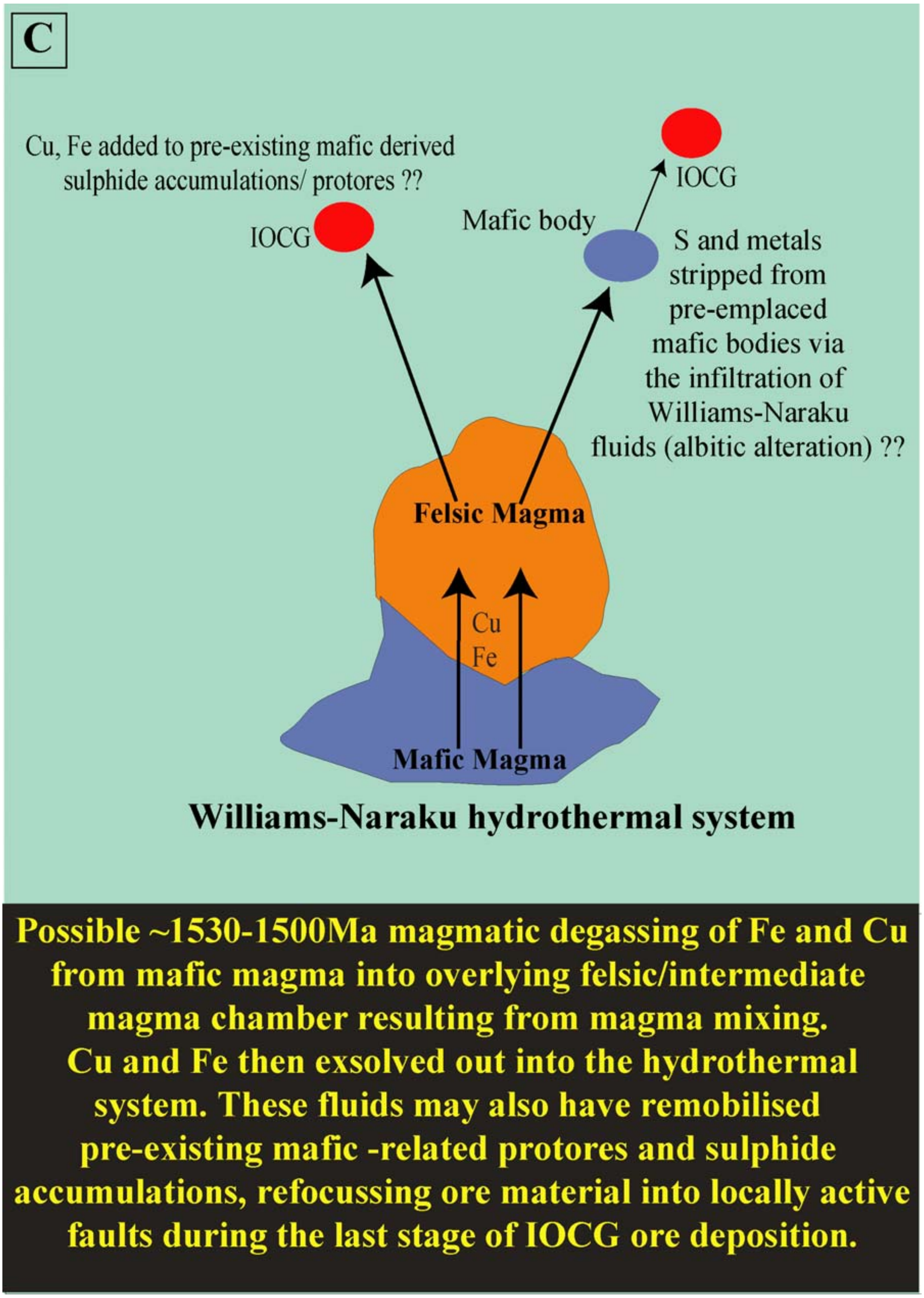


Figure 6c. Schematic interpretation of the process of Cu and Fe transfer between mixed mafic-felsic melts, and subsequent addition to pre-existing crustal sulphide accumulations, and potential albitic alteration of pre-emplaced mafic bodies as a source S and metal for IOCG ore.

Conclusions

After detailed petrographic and geochemical work on the mafic rocks of the Mount Isa Eastern Succession, it is evident that they could have played a critical role in supplying sulphur and metals to IOCG. At 1686Ma/1660Ma, metal and sulphur accumulations in the upper crust may have been deposited via the exsolution of a metal-volatile rich phase directly from crystallizing mafic magmas. These concentrations were potentially focussed proximal to the mafic rocks, possibly in large, early extensional fault systems such as the Mt. Dore Fault Zone, or in disseminations above 1686 magma chambers. 1600Ma to 1580Ma peak-metamorphism (upper greenschist to upper amphibolite grade) played a key role in scavenging sulphur and metals both from pre-(1686/1660Ma) and syn-(1600-1580Ma) emplaced mafic rocks, and may also have remobilised pre-existing crustal accumulations from the earlier 1686/1660Ma mafic rocks, leading to the formation of early ore deposits. Oxidised hydrothermal brines and albitic fluids associated with the 1530Ma felsic-mafic mixed and mingled Williams-Naraku Batholith may have leached further metals, and potentially added more copper to the system directly, but probably did not directly contribute sulphur. These fluids and the associated structural regime at 1530-1500Ma provided the final spatial controls, locally, on ore genesis.

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CHAPTER 3

A protracted multi-staged model for Fe oxide-Cu-Au mineralisation, Mount Isa Eastern Succession, NW Queensland.

(A reworked version of this Chapter with significant contributions by Nick Oliver was published in Precambrian Research – That paper is included as Appendix III of this thesis.

Chapter 3: Butera 80%, Oliver 15%, Nortje 5%; Precambrian Reseach Paper: Oliver 50%, Butera 45%, Others 5%)

A protracted multi-staged model for Fe oxide-Cu-Au mineralisation, Mount Isa Eastern Succession, NW Queensland.

Butera, K.M., Oliver, N.H.S. and Nortje, G.S.

Abstract

Protracted metal and sulphur contributions to the Mount Isa Eastern Succession Iron oxide-Cu-Au (IOCG) province occurred primarily as a consequence of long-lived fluid and melt fluxes from the base of the crust, stimulated by initial back-arc emplacement of voluminous mafic magmas. The concentration of sulphur, iron, copper and gold into the presently observed mineral deposits involved a significant component of remobilisation and reworking of early initial enrichments (pre- to syn-Isan Orogeny) by later fluids (syn- to post-Isan and syn-Williams/Naraku Batholith). Osborne (eastern domain) and Eloise-type ores formed or were strongly remobilized at c. 1600 Ma by reduced, mafic-derived fluids, whereas oxidised brines released by the Williams/Naraku granitoids overprinted magnetite ± sulphides at Osborne (western domain) and Starra to produce younger (c. 1530 Ma) hematite-chalcopyrite associations. CO_2-rich, potentially mantle-derived fluids may have periodically pulsed through the system, manifest now as pyrrhotite-stable carbonate veins and pods. Exploration for Ernest Henry and Starra style deposits should focus on recognition of oxidised corridors in relation to mafic- proximal and structurally- defined targets, However, the possibility remains that large, early mafic rock related Cu-Au ± (Fe, Co, Ni, Zn) deposits are preserved distal to the oxidising effects of the Williams-Naraku hydrothermal system, and may also present exploration opportunities.

Keywords: Cloncurry, iron-oxide-Cu-Au, mafics, alteration, mineralization

Introduction

Genetic models developed in recent years for IOCG deposits of the Eastern Succession have focussed attention mostly on the role of volatile phase separation from the Williams-Naraku Batholiths as the most likely source of metals (Rotherham et al, 1998; Perring et al, 2000; Pollard et al, 2001). This concept has not particularly helped explorers because of the apparent distal relationship between the intrusions and known ore deposits. Recent work (Chapter 2) has identified a more protracted history of contribution of metals and sulphur, and a spatial distribution implicating, in particular, faults and mafic rocks (Butera et al, 2005; Mustard et al., 2005; Ford et al, 2005; McLellan & Oliver, 2005). These new ideas are developed here, including also consideration of the tectonic evolution that hosted to the protracted metals contribution. An attempt is also made to develop a more complete model that incorporates previous work on the Williams-Naraku batholith as well as the new concepts.

Several observations raise questions about models that focus on syn-1530 Ma and Williams Batholith-dominated IOCG development:

1. The Mary Kathleen Fold Belt (MKFB) lacks Williams-age intrusions, despite comparable styles, if not extent, of albite alteration to the Cloncurry District, supposedly mostly related to the Williams-Naraku batholiths (Williams, 1998; Oliver et al., 2004). The MKFB also contains a significant IOCG resource (Trekelano).

2. There is a notable convergence of stable isotopic signatures of alteration systems of all ages (from 1740 to 1500 Ma) upon mantle-like values, with outliers clearly related to admixture with Corella marine carbonates, or Soldiers Cap black shales (Oliver et al., 1993; Oliver et al., 1994; deJong &Williams, 1995; Oliver, 1995; Rotherham et al., 1998; Mark et al., 2000; Baker et al., 2001; Marshall, 2003; Oliver et al., 2004; Marshall and Oliver, 2006). The convergence cannot be related only to the influence of Williams-age magmatic fluids because it includes abundant pre-1530 Ma veins and alteration (Figure 1).
3. There is metallogenic similarity of IOCG deposits apparently formed at different times, i.e. Osborne at pre- or syn-1600-1590 Ma and Ernest Henry and Mt Elliott at 1530 Ma, with the latter being coeval with Williams-Naraku Batholiths (Williams, 1998; Rubenach et al., 2001; Mark et al., 2006b)
4. Fluid inclusions from the deposits and regional vein systems show high salinity and variable Br/Cl ratios of fluid inclusion populations throughout the protracted hydrothermal history, implying that the Williams-Naraku system was not the only contributor to the unusual salinities, and that recycling of evaporite (Corella Fm) salt may have occurred several times.
5. Williams (1998) noted a strong mafic minor element association for many of the deposits, including enriched Ni, Co, V and Mn. Mingling and mixing of mafic magmas with the Williams-Naraku suite prior to or synchronous with fluid exsolution at 1530 Ma may explain the contribution of some of these elements to the IOCGs, but the same enrichments are apparent at deposits which have a pre-Williams age (i.e. Osborne).

6. The sulphur-undersaturated fluids of the Williams-Naraku batholith (Perring et al, 2000) presents a most perplexing question as to the source of sulphur and some metals for the deposits. Other fluid sources, or pre-Williams age sulphide accumulations or protores are needed to explain ore deposition (Chapter 3).
7. There is a need to explain the predominantly magmatic (or mantle) S isotopic signatures of both the early (Osborne) and late (Ernest Henry) IOCG ore (Mark et al., 2006b), even though only the latter are thought to have formed at the same time as the Williams Batholith.

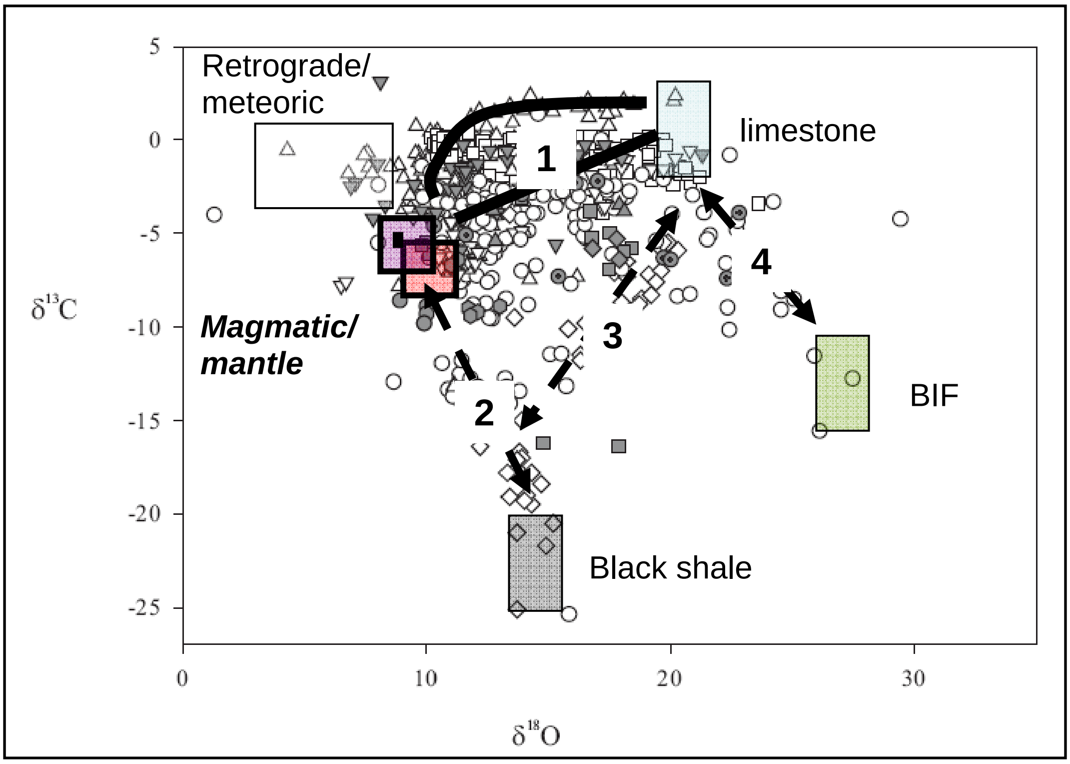


Figure 1. C and O isotope data for calcite and dolomite from IOCG deposits, veins and alteration systems in the Eastern Succession, from (Oliver et al., 1993; Marshall, 2003) and Marshall and Oliver (2006). The red box shows the inferred magmatic or mantle derived signal, the adjacent purple box to the left is the calculated fluid composition for fluid with modest CO_2 content at 450 to 500°C. This box has values intermediate between mafic or mantle fluids, and felsic-derived magmatic-hydrothermal fluids. The other boxes are the end-member isotope reservoirs (as carbonates) as indicated, trends 1and 2 represent admixture of Corella marine carbonates and Soldiers Cap black shales (respectively) with the mantle-like fluid, trend 3 is observed only at Dugald River(Zn-Pb-Mn) prospect and reflects an absence of the mantle signal and admixture of carbonate and black shale signals, and trend 4 is found only at Starra and Osborne in carbonates associated with the earliest iron oxides, which we therefore infer are true BIFs rather than metasomatic products. Data between trends 1 and 3 reflect likely passage of mantle or magmatic fluids through Corella carbonates before interacting with Soldiers Cap schists (Marshall, 2003; Marshasl and Oliver, 2006).

In this paper, we review models for the genesis of IOCGs in the Eastern Succession, and in light of recent work pertaining to the involvement of mafic rocks and magmas in ore genesis (Chapter 2), construct a more stringent set of IOCG genetic model parameters.

Protracted evolution of IOCG ore genesis, Eastern Succession

1750 to 1730 Ma

Prior to Soldiers Cap deposition, the end of the rifting and sag cycle that produced the Corella Fm and equivalents culminated in extensional deformation and the development of upper-crustal hydrothermal systems in which granite-gabbro bodies triggered circulation of basinal and magmatic-hydrothermal fluids (Holcombe et al., 1991; Pearson et al., 1992; Oliver et al., 1994; Oliver, 1995). U-REE and probably gold (Tick Hill) were added in subhorizontal shear zones and skarns (Oliver, 1995). Widespread dolerites and gabbros were emplaced into the Corella Formation and possibly reflect the first major injection of Cu into the Eastern Succession. However, it cannot be determined whether Cu was concentrated to ore grades at this time, even though Au and U-REE possibly reached ore grades. Constraints on the oxidation state and sulphur and metal content of fluids responsible for the U-REE and gold enrichments are limited due to uncertainty of solubility of U-REE and gold at very high salinities and temperatures (Oliver et al., 1999); however, widespread scapolitization of dolerites at this time, and some granites, points to the circulation of high salinity, CO_2-bearing basinal brines probably derived by evaporate dissolution (Oliver et al., 1994).

1690 to 1620 Ma

Early extension

The 1690 to 1650 Ma portion of this time period involved extension, widespread mafic volcanism, intrusion, and sedimentation in the Eastern Succession, and inferred contribution of significant copper via exsolution of a CO_2-H_2O-S fluid late during fractional crystallisation of mafic magmas (Chapter 2; Butera et al., 2005). In the Mt Isa area, Rubenach et al. (unpubl. report) have recently identified a major extensional hydrothermal system associated with the emplacement of the Sybella Batholith at c. 1672 Ma. Similar to the earlier Wonga-Mary Kathleen system, the Sybella was emplaced into an extensional shear zone, causing widespread circulation of basinal fluids. This system may have been responsible for localisation of heat flow associated with syn-sedimentary and diagenetic Pb-Zn, and possibly Cu enrichments in the c. 1650 Ma Mt Isa Group. A major mantle or mafic connection to the bulk IOCG metal budget at this time is implied from recent work (Chapter 2; Butera et al., 2005), who postulate both a primary fractionation exsolution of S and metals, and a secondary leaching of S and metals during ~1600Ma metamorphism.

Onset of orogeny

Later in this time period, shortening and a possible phase of metamorphism commenced at c. 1640 Ma (Rubenach, 2005), probably shutting down the prior extension-related events, but also developing the first of a long history of sodic alteration systems in Soldiers Cap Group rocks (e.g. Snake Creek, Osborne). This pre-peak Isan metamorphic activity may have involved circulation of evaporate-derived fluids from overthrust Corella Fm, into the Soldiers Cap Group, driven by deformation and/or topography into the core of the newly developing orogenic belt (Oliver et al, 2005). The impact of this system on Cu-Au distribution is uncertain, but was probably similar, although more localised, than the effects of the main phase of the Isan Orogeny. It may have leached a large volume of pre-existing copper.

Isan Orogeny 1600 – 1580 Ma peak metamorphism

The main phase of the Isan Orogeny liberated metamorphic H_2O and CO_2 from the Corella Fm and equivalents, and H_2O from the Soldiers Cap Group, as well as significant quantities of salt (Marshall and Oliver, 2006).

Mafic dykes emplaced into the core of the Snake Creek Anticline at this time share characteristics with earlier mafic rocks emplaced during rifting, implying that although the depth of mafic magma generation had shifted, subduction was still active (Chapter 1; Butera et al., 2005). In situ or proximal partial melting of near-granulite facies metasediments produced localised pegmatites at Osborne at 1590 Ma (Rubenach, 2005), probably triggered by fluid fluxing. The abundance of pyrrhotite preserved in the eastern domain at Osborne suggest that metamorphic or other fluids at this time were relatively reduced, as reflected in the local presence of methane and nitrogen in the fluid inclusions there (Fu et al., 2003). Osborne methane-bearing brines contain elevated Cu concentrations, and this may reflect the capacity of reduced S-poor fluids to carry Cu as species other than sulphate, i.e. various Cu chlorides (Mustard et al., 2004; Davidson et al., 1989). CO_2-rich fluids at Osborne display elevated arsenic contents and relatively low chloride – if As acted as a proxy for Au, this may indicate that Au in these systems is carried in an HCOS vapour. This vapour may have exsolved from mafic rocks or come directly from the mantle, although it may have been derived by unmixing (Mustard et al., 2004) of a complex metamorphic fluid.

Most significantly, metamorphic fluids remobilised sulphides from mafic rocks (Chapter 2; Butera et al., 2005), and earlier sulphide accumulations, as indicated by petrography and mass balance calculations. If we accept that 1600 to 1590 Ma Re-Os and U-Pb ages at Osborne represent the major time for metal accumulation, then a cycle of leaching by and reprecipitation from metamorphic fluids may explain this deposit (and potentially other enrichments elsewhere such as Selwyn, Eloise and pre-ore shear zones at Ernest Henry). Alternately, if Osborne was formed earlier, during or soon after sedimentation and volcanism (e.g. similar in timing to metal introduction at Cannington), then the metamorphic fluids both imparted the radiogenic isotope signal and redistributed sulphides (both chemically and mechanically) into favourable D_2 and/or late structures. In any case, mafic and/or mantle derived fluids most likely provided the bulk of the metal and sulphur for this deposit, and similar ore types (e.g. Eloise, early magnetite-chalcopyrite at Starra, see below). The key characteristic of fluids at this time was their reduced nature, unlike at least some fluids exsolved off the later Williams Batholith (Perring, 2000).

Williams thermal event, 1550 – 1490 Ma

Oxidised brines

Examination of alteration systems in close proximity to the Williams-Naraku Batholith gives the best idea of how these intrusions may have contributed to the

IOCG deposits. Mark (1998) first documented the complexity of alteration around the top of intrusions at Mt Angelay, speculating on the exsolution of hypersaline, CO_2-bearing brines as a cause of albite alteration that affected the granite carapace and surrounds. Perring et al. (2000) and Pollard (2001) documented the co-occurrence of sodic alteration and voluminous magnetite at Lightning Creek, inferring an origin for this alteration by unmixing of complex brines upon release from the crystallizing granite-gabbro sill complex. Oliver et al. (2004) built on this work to propose that granite-derived fluids moving through metasedimentary rocks attained elevated Fe- and K-contents by wallrock interaction, prior to their potential involvement in Ernest Henry-type IOCG genesis, and Cleverley and Oliver (2005) have modelled the effect of oxidized, modified magmatic brines in the production of alteration proximal to Ernest Henry. Oliver et al. (2006) have also documented the occurrence of pipe- and sheet-like breccias emanating from contact aureoles of the Williams Batholith, which they inferred may have been driven by CO2 expelled from mingled mafic-felsic intrusions.

Fluid inclusions at Lightning Creek are distinctive for their highly elevated Fe, Ba and Cu contents, implying at least one of the fluids present was sulphur-deficient (Perring et al., 2000). The apparent absence of sulphur in these granite-proximal systems, but the presence of sulphur with distinctive mantle- or magmatic $\delta^{34}S$ values in the deposits (e.g. Mark et al. 2006b), most likely requires derivation of deposit sulphur from sources other than the c. 1530 Williams Batholith, such as mafic rocks and magmas (Chapter 2).

Fluid inclusion data reveal some connections between granites and aspects of the orebodies, although the interpretation is complex. Figure 3, for example, shows an apparent clear connection between Ernest Henry and fluid inclusions from the top of the Mt Angelay pluton (Mustard et al., 2004), separate from the other (inferred older) deposits. However, Fe and Cu are constituents of chalcopyrite, so the data can also be inferred to be a consequence of depletion of ore fluids in these components as they are precipitated from the original fluids. Lightning Creek, with the highest Fe and Cu contents in fluid inclusions, has no chalcopyrite (although a huge volume of magnetite); and Ernest Henry, with modest Fe and Cu in the fluid, is the biggest orebody. The trend is further confused by regional fluids associated with albitization. Overall, the fluid inclusion data probably reflect a close association between granitoids and the inferred oxidised, S-poor fluids at Ernest Henry and Lightning Creek, with the latter in particular lacking sulphur and/or at too high temperatures for ore formation.

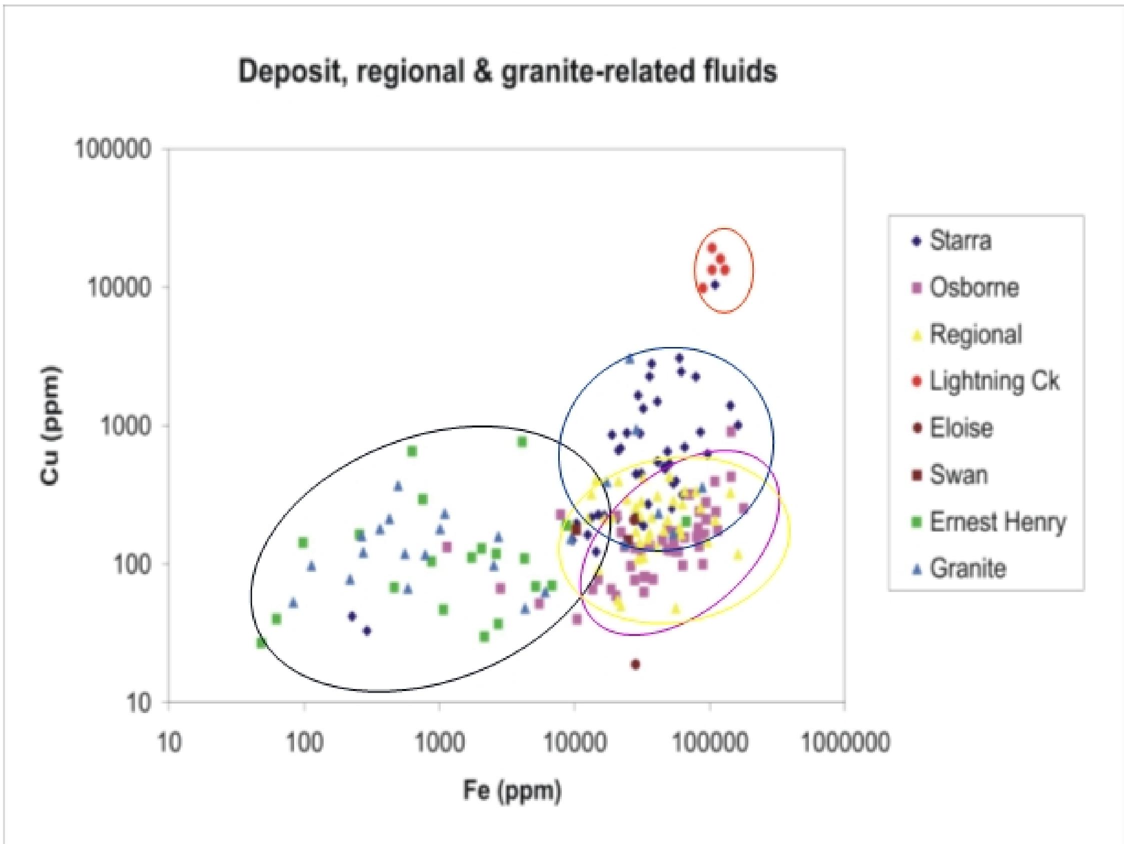


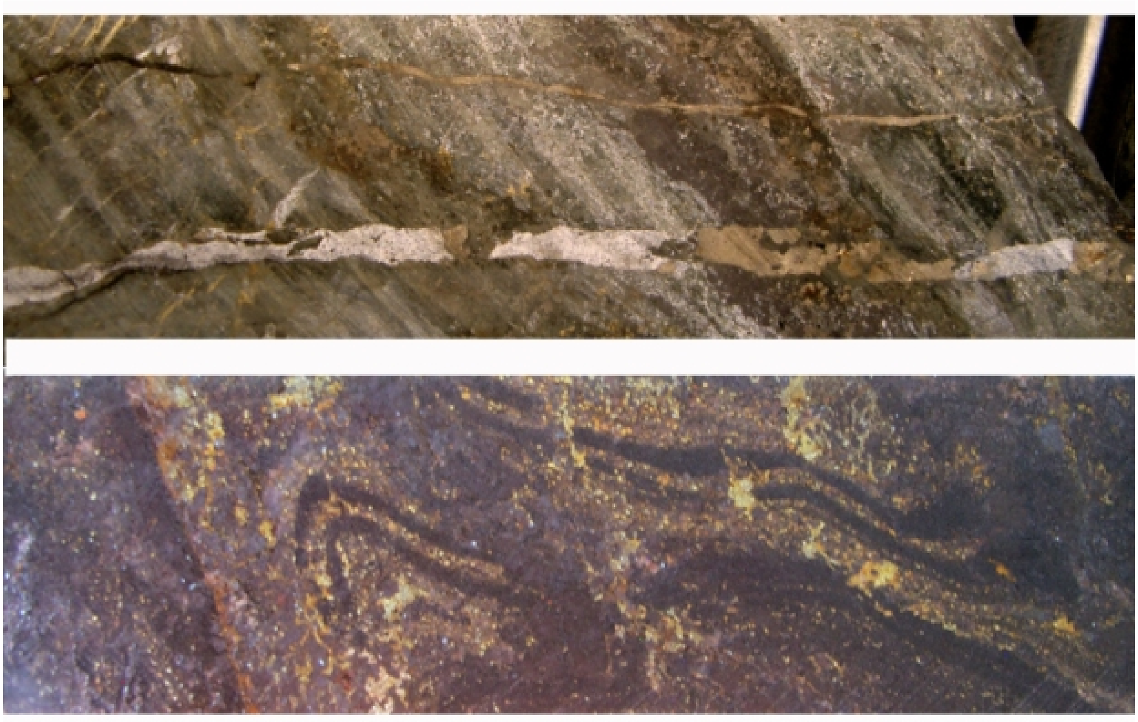
Figure 3. PIXE fluid inclusion data from Eastern Succession deposits, prospects, Mt Angelay Granite, and regional alteration. From Perring et al. (2001), Williams et al. (2001), Mustard et al. (2004) and Fu et al. (2004).

In the Snake Creek area, breccia pipes emanating from contact aureoles of 1530 Ma granitoids (Oliver et al., 2006) are dominated by magnetite, hematite, and albite (Cleverley & Oliver, 2005). Sulphides are found only in these pipes either within relict gabbro bodies (that themselves were probably emplaced syn-granite) or in distal locations where wallrocks or other fluids may have provided the sulphur. The implication of all of these lines of evidence is that the Williams Batholith released large volumes of oxidised, sulphur-poor fluids that locally carried copper and iron, and may have released some of this fluid via violent brecciation processes. This fluid may have been involved in oxidation of earlier reduced iron oxide ± sulphide assemblages at Osborne and Starra.

Textural and geochronological evidence for protracted cycling of metals in and around mineral deposits of the eastern succession.

Despite a proliferation of Ar-Ar ages in the range 1540 to 1490 Ma for Eastern Succession IOCGs and abundant evidence for late sulphides and related alteration, U-Pb and Re-Os ages of many of these deposits point to inherited components. The original understanding of the age of peak metamorphism at the time of these studies was focussed around the 1550 Ma age inferred from the Western Succession and Mary Kathleen orebody, such that the Williams Batholith was regarded as immediately post-peak metamorphic and evolving metamorphic-magmatic fluid systems were seen as viable (e.g. Rotherham et al., 1998; Baker et al., 2001). More recent recognition of earlier metamorphism, peaking at 1600-1590 Ma with D_2 deformation (Gauthier et al., 2001; Rubenach et al., 2001; Giles & Nutman 2002), and a possible earlier event at ~1640 Ma (Rubenach, 2005), requires a reinterpretation of earlier workers' paragenetic stages.

The protracted history of mineralisation and remobilisation is well displayed by the Mary Kathleen uranium orebody, which has a clear history of initial U-REE enrichment at km-scales associated with emplacement of the c. 1740 Ma Wonga-Burstall granites (providing a notable prospector's target at 1:100 000 scales), and yet the orebody in its present appearance was assembled at 1550 to 1500 Ma (Page, 1983a; Maas et al., 1988; Oliver et al., 1999). The timing of these events implies initial enrichment followed by repeated recycling and remobilization, leaving behind the ultimate question as to whether the 1550-1500 Ma event involved regional leaching of disseminated U-REE, or remobilization of an already formed orebody or protore. Similar issues are now quite pertinent to the IOCG deposits. Silica alteration forming the envelope to Osborne is locally marked by a banded, gneissic foliation (M. Rubenach, pers. comm.) and this foliation is folded by folds which are correlated with regional D_2 – i.e. this silica alteration is pre- or syn-D_2 in timing. The earliest iron oxides in this deposit have a distinctive BIF-like stable isotope chemistry (Marshall et al., 2006; Fig. 1 herein), and are clearly pre-D_2 (Figure 4b), being overprinted by coarse magnetite and chalcopyrite that was apparently introduced (or remobilized) during and after D_2. These observations at Osborne are confirmed by the bimodal distribution of geochronological data (See Table 1, Chapter 2), with both 1600-1590 Ma and 1540 – 1520 Ma results being prominent. Similar geological observations can be made at Eloise, where at least one of the orebodies contains abundant folded and foliated sulphides (Figure 4a) and *durchbewegung* texture (Figure 4c), although there has been insufficient geochronological work with U-Pb or Re-Os to determine an age for this likely older mineralisation style. Baker (1998) originally inferred a progression from metamorphism to ore genesis at Eloise, with significant alteration and mineralization occurring during the metamorphic stage. By this reasoning, with the recent geochronology, these stages would now be separated by 70 m.y. or more.



Figures 4 a) top and b) bottom: evidence for pre- to syn-D2 sulphides at Osborne and Eloise.
Figure 4a: Foliated pyrrhotite-calcite-amphibole ore at Eloise –the presence of deformed ore suggests syn- to pre-1600 Ma timing. This is cut by a later vein that demonstrates a close match between wallrock mineralogy and vein mineralogy, suggesting diffusional control of infill i.e. later diffusional remobilization (e.g. Oliver and Bons, 2001).
Figure 4b: Osborne ore with folded (pre-D2) magnetite and disseminated chalcopyrite, overprinted by magnetite seams containing patchy sulphides and zones of sulpide depletion; the latter appear to be syn-D2 (axial planar) structures.

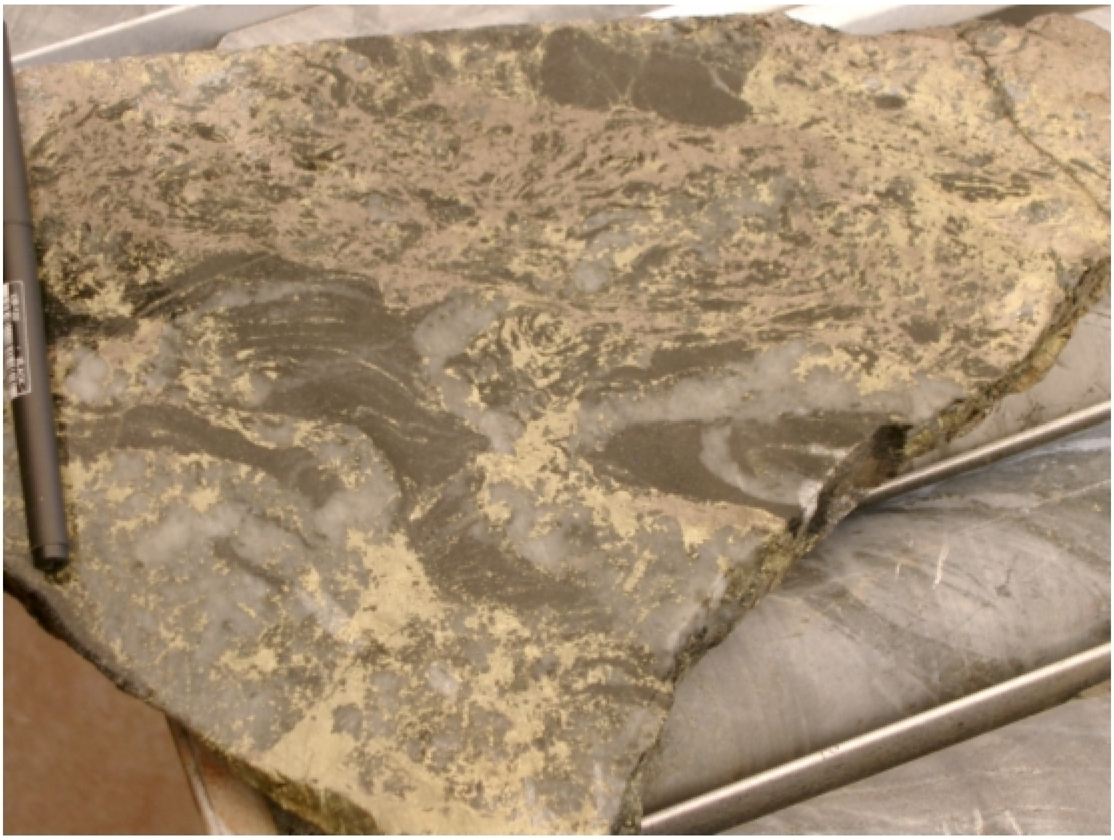


Figure 4c. Classic *durchbewegung* texture developed in pyrrhotite-rich ore at Eloise Cu-Au deposit: note the transposed fold remnants in the silicified alteration zone (bottom), texturally younger sulphides remobilized into boudin necks (pale pyrrhotite), and the shredded appearance of most of the pyrrhotite at the top. If the regional deformation peak accompanied peak metamorphism at c. 1600 Ma, these sulphides must be pre- to syn-1600 Ma, younger than the Ar-Ar ages (c. 1520 Ma, Baker et al., 2001.

Despite the bulk of the ore at Starra being dominated by coarse chalcopyrite and hematite which transgresses foliations, we have observed rocks in the open cuts containing magnetite and chalcopyrite in which the chalcopyrite forms irregularly spaced bands that look like bedding, and all are folded by D_2 folds. Some or even all of the later paragenesis of hematite-chalcopyrite may have overprinted or remobilized earlier magnetite that already contained chalcopyrite. The original premise of Davidson & Large (1994) concluding that some ironstones and possibly some sulphides pre-date peak metamorphism is also supported by stable isotope data (Marshall et al., 2006) which support a clear, non-Williams origin for early magnetite at both Osborne and Starra (Figure 1).

Although old ages persist in some of the recent geochronological data for Ernest Henry (Mark et al., unpubl. data; Butera et al., 2005), Ernest Henry shows little if any apparent physical or paragenetic inheritance within the orebody. The ore is defined by a fairly sharp-edged breccia in which magnetite-chalcopyrite-pyrite-calcite ore is clearly related to the brecciation, and titanite and molybdenite within ore have precise 1527 Ma ages (Mark et al., 2006b), similar to the nearby 1530 Ma Mt. Margaret Granite. The orebody is also notable for significant enrichment in fluorine (in biotite and fluorite), and F is also enriched in breccias emanating directly off the Mt Angelay intrusion (Rubenach, unpubl. data; Cleverley & Oliver, 2005), and in the skarn-like Mt Elliott deposit (Wang & Williams, 2001). In addition, the Ernest Henry breccia has very similar internal characteristics (clast spacing, roundness, roughness and particle size distribution) to the unmineralised but magnetite-enriched breccias near the Mt Angelay Granite (Figure 5), and may share a common physical origin (comminution, chemical corrosion and abrasion in a fluidised breccia pipe or chamber) (Oliver et al., 2006).

Figure 5. a) Top – typical Ernest Henry ore breccia with hematite-K-feldspar altered clasts in a magnetite-chalcopyrite-pyrite-Kfeldspar-calcite±barite-titanite matrix.
b) Bottom – typical breccia from a breccia pipe emanating from the Mt Angelay Granite and crosscutting Soldiers Cap Group schists, from the western edge of the Snake Ck anticline, with albite-actinolite-magnetite±Kfeldspar-chlorite clasts set in a albite-magnetite-hematite-actinolite matrix. Scale is similar in both photographs.

Ernest Henry fluid sources

Unlike Osborne or Cannington, the Ernest Henry orebody shows few physical attributes that can clearly be related to pre-Williams-Naraku hydrothermal events (Mark et al., 2005). Although inherited source components are present at 1650 to 1600 Ma (Re-Os wholerock and Pb-Pb chalcopyrite (pers. comm. K. Bassano), we remain uncertain as to the extent to which local (≤ 1km scales) pre-1530 Ma concentrations of Cu-Au ore, sulphides, or ironstones provided mass for the present orebody. The distinctive K-feldspar-hematite alteration of the host volcanic rocks associated with ore deposition (Mark et al., 2006b) was probably caused by reaction of initially granite-derived fluids, modified by albitization, with the host metavolcanic rock, as suggested by geochemical models (Oliver et al., 2004; Cleverley & Oliver, 2005). Barian K-feldspar associated with this ore-related alteration reflects likely absence of sulphur in one of the fluids, whereas the presence of barite late in the ore paragenesis suggests the possibility of fluid mixing (Mark et al. 2006b).

The key ore-forming fluid ingredients at Ernest Henry are thus considered to be:

1) Oxidised Fe- and K-rich fluid derived by brine release from the Williams Batholith during brecciation events, modified by wallrock reaction along the transport paths and deposition sites, and potentially carrying copper derived from magma mingling with mafic bodies at 1530 Ma.
2) Reduced HCOS fluid derived either directly from the mantle, by leaching of pre-existing mafic rocks or protores, or by release of fluids from crystallising Williams-age gabbros
3) 3) A possible contribution from surface derived fluids is implied by the Br/Cl fluid inclusion data (Mark et al., 2005); however these fluid inclusion results may have been influenced by precipitation of Cl-bearing silicates in Ernest Henry alteration (e.g. biotite, scapolite).

It must also be noted, however, that recent wholerock Re-Os dating of Ernest Henry ore, treated as a Re-Os molybdenum age, yielded an age of 1687Ma, within error of the proposed 1686Ma mafic exsolution event (pers. comm.. B. Schaffer, 2005). This suggests the possibility that at least some component of the ore in the Ernest Henry deposit was derived from either mafic material, or an early protore formed in response to 1686Ma mafic magmatism.

A protracted history of interaction between mantle-derived mafic melts, possible mantle-derived fluids, and the lower crust which produced the Williams Batholith (Mark et al., 2005) can explain the diversity of ages and associations in the district, but also the commonalities. Highly abundant CO_2-rich fluid inclusions in the district are not primarily a consequence of devolatilisation of the Corella Fm carbonates, because the CO_2 is found in inclusions of most ages, and associated carbonates have C- and O-isotope signatures indicative of mantle or magmatic sources (Marshall et al., 2006). This implies that mantle or magmatic CO_2 was available at almost every stage of the evolution of the belt, a situation most likely to evolve during protracted crystallisation of bimodal magmas. The interactions between mantle-derived melts, mantle fluids and generation and emplacement of felsic magmas involved:

1) Prior to 1550 Ma, significant concentrations of IOCGs had already occurred, by release of fluids directly off the top of crystallising mafic intrusions, potentially even by exhalation in mixed sedimentary-mafic rock packages, and probably by leaching and reprecipitation during regional metamorphism (Butera et al., 2005, Chapter 2).
2) At c. 1550 Ma, a phase of extension or possibly volatile fluxes from deep in the mantle lithosphere triggered renewed generation of basaltic melt just below the Moho, and triggered anatexis of lower crustal felsic melts with a distinctive mantle radiogenic isotope signature (Mark et al, 2005).

3) Some felsic intrusions, e.g. Lightning Creek, may have been contaminated with voluminous mafic melts at a relatively early stage of crystallisation, leading to widespread mingling, mixing, and transfer of metals in the melts.

4) Other felsic intrusions evolved to a much greater extent by protracted crystallisation (e.g. Mt Angelay, Mt Margaret), such that the remaining felsic liquid was near saturated with large volumes of oxidized, hematite-stable brine. Emplacement of CO_2- and possibly Cu-bearing mafic magmas into these rocks may have triggered release of Cu and CO_2 during quenching of the mafic rocks, which in turn forced exsolution of the brine from the granitoids (e.g. Oliver et al., 2006).

5) Consequently, explosive release of mixed volatiles at the granitoid carapaces produced discordant breccia pipes which carried Fe, Mn, K, Na, Ca and possibly Cu to sites above the intrusions, potentially to make orebodies. The same fluid, where it interacted with pre-existing ironstones and/or IOCGs, oxidised these rocks and either redistributed or added some copper as sulphide via redox reactions (e.g. Starra, Osborne western domain).

6) Direct release of reduced CO_2- and S-bearing fluids from crystallising mantle or lower crustal mafic melts may have produced carbonate-dominated vein systems in rocks away from the Williams Batholith.

7) Where the primitive mantle- or gabbro-derived HCOS fluids met with the brine-laden fluids evolved off highly fractionated Williams Batholith, Ernest Henry may have formed. Alternately, the S was derived from older, remobilised sources proximal to Ernest Henry. It is possible that orebodies such as Starra formed where oxidised Williams-derived fluids interacted with pre-existing sulphides until a point where the fluid became sufficiently reduced that sulphide

saturation was imminent, with final ore precipitation occurring due to pressure changes and phase separation. However, this “single fluid” model does not explain the fluid inclusion complexity at Starra nor the presence of barite (Williams et al. 2001).

Tectonic Setting and IOCG Metallogenesis

On the basis of the major early phase of mapping by the Geological Survey of Queensland and the Bureau of Mineral Resources in the Mt Isa Block, Wilson (1978) proposed, on the basis of the overall asymmetry of the sedimentary-volcanic packages, that the eastern edge of the Mt Isa Inlier was close to a plate boundary. Part of the evidence included an appreciation of the Soldiers Cap Group as relatively deep water, high energy turbidites in comparison to possible time equivalents in the centre and west of the Inlier. Subsequently, a continent-scale model for intra-cratonic rifting and limited thickening was developed (Etheridge et al., 1987), supported by concepts of bimodal igneous geochemistry, lack of andesites and blueschists, and recognition of apparent temporal similarity between packages of rocks in the Western and Eastern Successions. Both these models have some validity in recent reinterpretations, because the mafic magma chemistry, and indeed the asymmetry of the metal endowments, can be interpreted in the context of a back-arc continental environment (Chapter 1; Butera et al, 2005) in which a plate boundary was somewhat closer to the Eastern Succession than suggested by the 'far-field back-arc’ model of Giles et al. (2002).

Modern continental back-arcs are characterised by high heat flow and bimodal igneous activity and any possible blueschists typically lie closer to the trench, such as the relationship between the Basin-and-Range and the Franciscan blueschists in western USA (Krueger and Jone, 1989). The global distribution of IOCGs is also certainly not restricted to rifted continental interiors, with several examples lying in arcs or back-arcs in the Cainozoic tectonic context, particularly in the Andes (Williams et al., 2005). Hypotheses of plate boundaries sitting within 200km of the eastern boundary of the exposed Mt Isa Block have recently been considered (Chapter 1; Butera et al, 2005).

Another feature of arc-related hydrothermal systems worldwide is the capacity of dewatering subducted oceanic slabs to act over a protracted period, to liberate fluids and incompatible elements directly by devolatilization, and to trigger mantle metasomatism, upper mantle partial melting and lower crustal dehydration and melting, all of which subsequently can lead to further volatile release via emplacement of crustal magmas (e.g. Peacock, 1993; Peacock et al., 1994).

The Eastern Succession is marked by c. 250 m.y. of metasomatic activity, not just by two major phases related to metamorphic devolatilization and granite emplacement. In modern convergent systems, porphyry copper deposits and island-arc related epithermal systems are a product of this type of process in fore-arcs, and such deposits are not apparently found at Mt Isa. However, back-arc extension systems can produce both Besshi-style (magnetite-chalcopyrite-dominant) and Kuroko-type (Cu-Pb-Zn) VHMS deposits, IOCGs, and a range of sediment-hosted deposits, right from the initial volcanism and rift-related sedimentation, through to basin reactivation and local shortening triggered by subduction of oceanic plateaus or continent scale shift in plate vectors. This particular environment, in which early basin metal contributions may be rapidly overprinted by the effects of convergent metamorphism, may be the specific reason for the distinction between BHT Ag-Pb-Zn and the "SEDEX" shale-hosted orebodies in northern Australia, the latter having formed in the distal flanks of the rifting system whereas BHTs may have formed and been reworked in a more arc-proximal setting (Chapter 1).

Conclusions: Synthesis of IOCG ore forming processes, Eastern Succession

In light of the new understanding of the critical processes involving mafic rocks in the contribution of significant concentrations of sulphur and metals, it is no longer apparent that the Williams age granites were the key source of metals for IOCG mineralisation. Spatial, temporal and geochemical evidence now supports a much more important role for mafic magmas and rocks than previously recognised. Complications in the attempt to directly link mafic rocks to IOCG mineralisation arise due to the nature of multiple periods of metamorphic and hydrothermal remobilisation. These hydrothermal, albitisation and metamorphic events at 1640Ma, 1600-1580Ma and 1530-1500Ma were all capable of remobilising pre-existing sulphide concentrations, from deposits, proto-ores or disseminated country rock metal accumulations, at scales comparable to the degree of mafic-deposit correlations in detailed prospectivity analysis (Butera et al, 2005; Chapter 4).

At 1686Ma metal and sulphur accumulations in the upper crust were deposited via the exsolution of a metal-volatile rich fluid from mafic magmas (Figure 7). These concentrations were potentially focussed proximal to the mafic rocks, possibly in large, early extensional fault systems such as the Mt. Dore Fault Zone, or in disseminations at the top of, or in the roof zones of, the 1686Ma-1660Ma magma chambers. A localised metamorphic event with a possible association with albitisation at 1640Ma (Rubenach, 2005) may have had a minor remobilising effect on the metals and sulphur in the Snake Ck area. 1600Ma to 1580Ma metamorphism played a key role in scavenging sulphur and metals both from pre-(1686/1660Ma) and syn-(1600Ma) mafic rocks, in addition to pre-existing accumulations from the earlier 1686Ma mafic rocks, leading to the formation of Osborne, and possibly Eloise. Oxidised hydrothermal brines and albitic fluids associated with the 1530Ma felsic-mafic mixed Williams-Naraku Batholith may have leached further metals, and potentially added more copper to the system directly, but probably did not directly contribute sulphur. These fluids and the associated structural regime at 1530-1500Ma provided the final spatial controls on ore genesis. Fluids derived from both the Williams Batholith (Mark et al., 2006b) and a direct or indirect primitive mafic source are implicated in the genesis of the Ernest Henry deposit (Cleverley & Oliver, 2005; Oliver & Cleverley, 2004).

A protracted history of uranium and REE remobilisation at 100m to km-scales was inferred at Mary Kathleen by Maas et al. (1988) and Oliver et al. (1999), with primary enrichment at 1740 Ma culminating in eventual ore accumulation by remobilisation at c. 1530 Ma. A similar process is inferred here for copper in the Eastern Succession. This may explain the presence of mineralisation in c. 1590 Ma D_2 folds in the Selwyn-Starra area, and at Eloise, older than the apparent 1550-1500Ma Ar-Ar age dates for mineralisation. These data suggest that sulphur at least may have been derived from local mafic rock, or even pre- to syn-1600 Ma proto-ores, during a 1530Ma magmatic-hydrothermal brecciation and magnetite precipitation event. A revised event chronology for the Eastern Succession is shown in Figure 6, and a summary diagram of the processes leading to IOCG ore deposition is given in Figure 7.

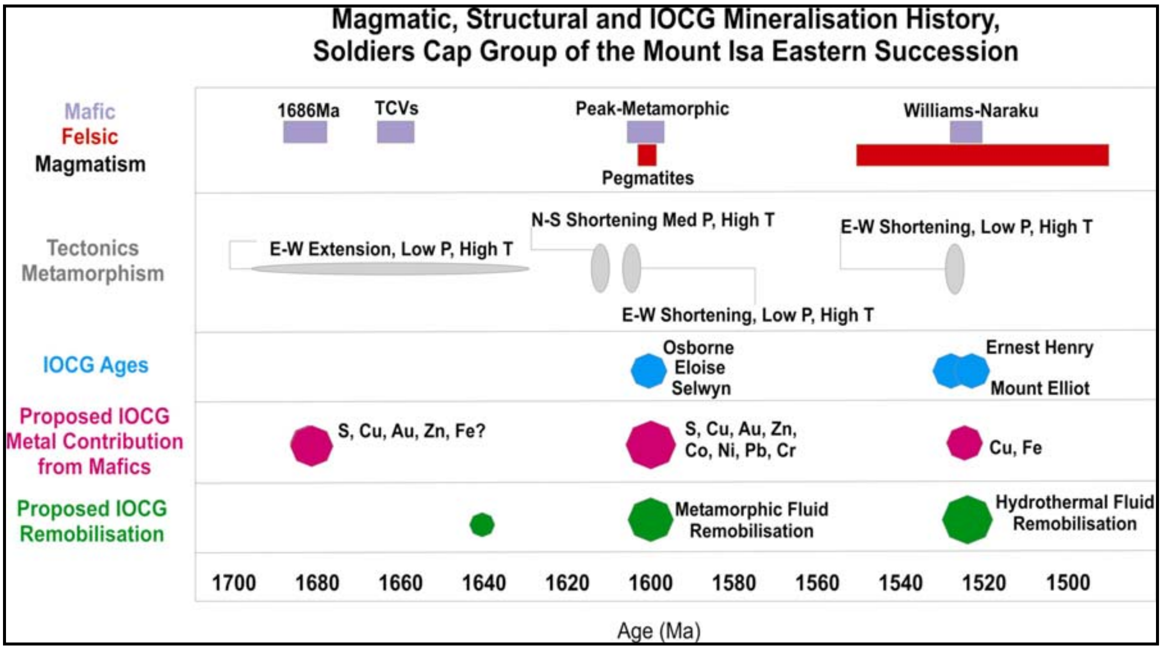


Figure 6. Summary of the magmatic, structural and IOCG mineralisation history of the Soldiers Cap Group, with proposed timing of metal and sulphur contributions from mafic rocks, and proposed IOCG remobilisation events. TCV = Toole Creek Volcanics.

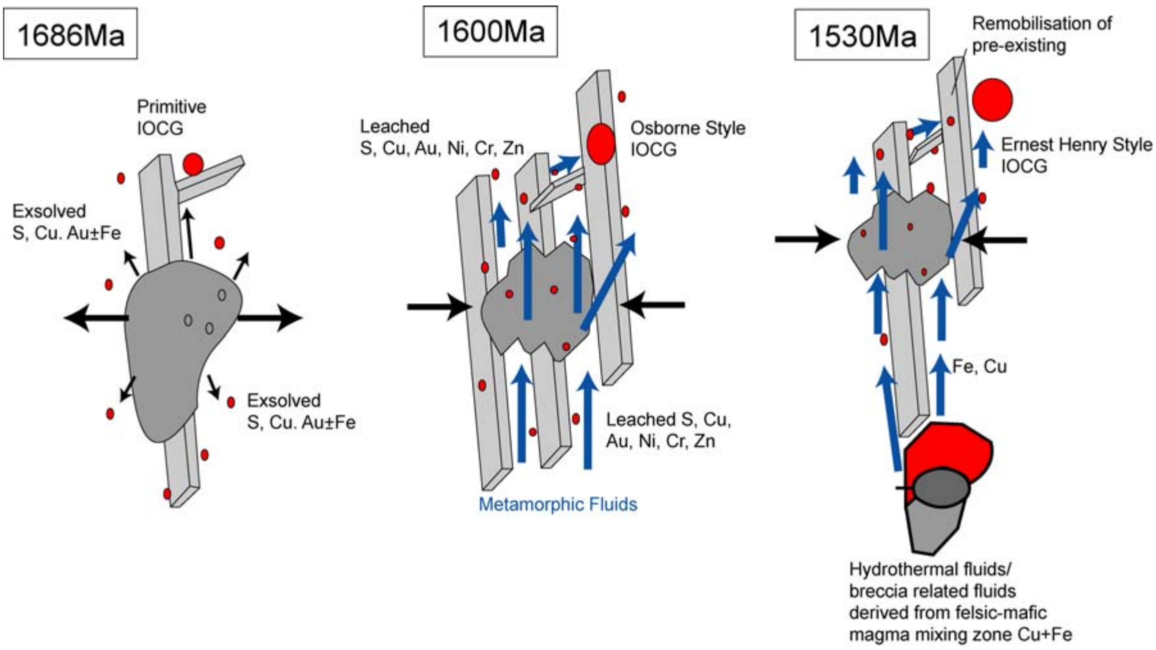


Figure 7 Evolutionary model of the contribution of S and metals via direct exsolution from mafic magmas at 1686Ma, metamorphic leaching at 1600Ma, and hydrothermal remobilisation with addition of Cu and Fe from mixed felsic-mafic magmatic fluids at 1530Ma. Large grey blobs are mafic bodies, small red blobs are Cu-Au (IOCG) protore, and large red blob at bottom of 1530Ma diagram is granitic melt mingling/mixing with coeval mafic melt.

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CHAPTER 4

Spatial Associations of mafic rocks and Fe-oxide Cu-Au deposits, southern Mount Isa Eastern Succession: implications for exploration

Spatial Associations of mafic rocks and Fe-oxide Cu-Au deposits, southern Mount Isa Eastern Succession: implications for exploration

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Abstract

Within the southern portion of the Mount Isa Eastern Succession, mafic rocks, and faults that intersect areas of mafic rocks, exhibit a stronger spatial relationship to IOCG mineralisation than any other geological parameter. In contrast, felsic rocks, of which both genetic and exploration models have relied heavily upon in the past in order to explain the final localisation controls on IOCG deposits, do not display a significant relationship to mineralisation. The results attained call for an immediate review of exploration practices in the Eastern Succession, and call upon more mafic-related models in order to achieve further IOCG mineral discoveries.

Introduction

Strategies for exploring mineral systems in the Mount Isa Eastern Succession have been impaired in recent years by a lack of adequate ore genesis models, and further, recent work has demonstrated that previously unrecognised processes may play a critical role in these genetic models. Fe-oxide Cu-Au (IOCG) and Broken Hill-type Pb-Zn-Ag (BHT) deposits constitute the most economically significant of these mineral systems (Williams, 1998; Williams and Pollard, 2003)., and mineral explorers have focussed a considerable amount of their effort into identifying these mineralisation types in both exposed and undercover portions of the Eastern Succession. Until recently, exploration strategies for IOCG deposits relied primarily on geophysical techniques, and specifically, because of the relationship of Fe-oxides to Cu-Au mineralisation, magnetic anomalies proximal (often) to roof zones of the ~1550Ma-1490Ma Williams-Narakau Batholith felsic-intermediate intrusive rocks (Brescianini. 1992; Craske, 1995; QLD DME, 2000; Tullemans et al, 2001). Since the discovery of the world class Ernest Henry deposit in 1991, however, no significant IOCG deposits have been found.

Genetic models for IOCGs have generally relied on source components being derived via Cu- and Fe-rich phase separation from the crystallising Williams-Naraku Batholith (Rotherham et al, 1998; Perring et al, 2000; Pollard, 2001) often accompanied by Sodic-Calcic alteration (Mark, 1998; Williams and Polard, 2003; Oliver et al, 2004).

In order to overcome ever-depleting reserves, it is imperative to the future success of the Cloncurry mining district that an immediate refocused approach to mineral exploration is instigated. This study deals with the exploration implications of recent work regarding the role of mafics in IOCG genesis.

Spatial Analysis

Weights of Evidence: introduction

Weights of Evidence has been used by researchers (Mustard et al, 2005; Ford, 2005) recently to measure the spatial relationships of geological units to mineralisation, and to evaluate and rank the most significant geological units in order to help build process models for the genesis of a number of deposit types. Weights of Evidence measures the strength of a spatial relationship of a set of 'training data points' i.e. mineral deposits, with lithological or structural units. The basis for the calculation is the measured "chance of a mineral deposit falling within an area surrounding the studied unit (i.e. within a buffer of a certain radius around that unit), over the chance that it does not sit within that area." The resulting parameter of the strength of spatial relationship of a deposit to the studied area is termed the Contrast Value, while the statistical strength of the contrast value is referred to as the Confidence. Typically, a contrast value > 0.5 is considered a good spatial association, while this study considers a contrast value > 1 significant (more stringent). This study has applied the Weights of Evidence test to Iron-Oxide Cu-Au deposits (as described by the NWQMP dataset), Cu Deposits, All (metalliferous) deposits, Large Deposits (>500t metal), and Au-only deposits in the Mount Angelay and Selwyn 1:100K Geological Sheet Areas, a total of 240 individual deposits. Conditional independence tests, to measure the effects of stray data, or smaller sets of data, were performed in order to check the statistical viability of the results. The results were obtained by performing the Weights of Evidence test on the Mapinfo Software add-inn MI-SDM. Buffers were created at various scales (0-5km) around mafic rocks, granites and different fault types in order to evaluate the spatial strength between these units and the different mineral deposit types. This is calculated by calculating the chance of the number of a particular type of mineral deposits sitting in the area of a particular buffer ring around the geological feature, versus the chance that it lays outside that area. The resultant data is presented as the Contrast Value, along with the statistical strength of that data present as the Confidence Value.

Results

Provided here is a summary of the results of the Weights of Evidence spatial analysis study (Table 1). Detailed results are given below. Results were obtained for Mafic Rocks, Major Faults, Medium Faults, Minor Faults, Faults that intersect mafic rocks, Wimberu Granite, Mount Dore Granite, Gin Creek Granite, Mount Cobalt Granite, Mount Angelay Granite, Squirrel Hills Granite, Yellow Waterhole Granite, Saxby Granite, Cowie Granite, Marumungee Granite and Corella Breccia.

All Granites	All Deposits	Larger Deposits	Ironoxide Cu Au	Cu Deposits	Au Deposits
Distance	3.25-3.5km	INSIGNIFICANT	INSIGNIFICANT	1.25-1.5km	1.25-1.5
Contrast	1.41	INSIGNIFICANT	INSIGNIFICANT	1.19	2.29
Confidence	5.28	INSIGNIFICANT	INSIGNIFICANT	3.45	5.07
Deposits	15	INSIGNIFICANT	INSIGNIFICANT	9	6
Mafic Dykes	**All Deposits**	**Larger Deposits**	**Ironoxide Cu Au**	**Cu Deposits**	**Au Deposits**
Distance	0-250m	0-250m	250-500m	0-250m	0-250m
Contrast	1.99	1.77	1.71	1.7	1.2
Confidence	14.2	4.09	3.48	8.2	2.5
Deposits	71	7	5	30	5
Major Faults	**All Deposits**	**Larger Deposits**	**Ironoxide Cu Au**	**Cu Deposits**	**Au Deposits**
Distance	0-100m	0-100m	0-100m	0-100m	0-100m
Contrast	1.23	3.03	2.18	1.23	2.21
Confidence	5.62	7.92	4.76	4.06	5.2
Deposits	23	11	6	12	7

KEY	INSIGNIFICANT	SIGNIFICANT	HIGH	VERY HIGH

Table 1 Summary of the results of the Weights of Evidence spatial study.

Mafic Rocks vs Mineralisation:

- IOCG Deposits are optimally spaced from mafic rocks between 0km and 0.5km. Greatest optimisation was at 200-300m (4 dep, Contrast= 2.24, Confidence = 4.46), and at 1 – 1.25km (4 dep, Contrast = 1.41, Confidence =2.62)

- Cu Deposits are optimally spaced from mafic rocks between 0km (within mafic body) to 1km, particularly 0-250m (30 dep, Contrast = 1.7, Confidence = 8.20_. Greatest optimisations at 0-10m (13dep, Contrast = 1.87, Confidence = 6.39), 750m-1000m (24 dep, Contrast = 1.78, Confidence = 7.89)

- Au Deposits are optimally spaced from mafic rocks between 750m and 1km (15 dep, Contrast = 3.09, Confidence = 8.85), and 0-250m (5 dep, Contrast = 1.19, Confidence = 2.46). Of the deposits proximal to the mafic bodies, optimisation occurs between 100m and 200m (4dep, Contrast = 2.26, Confidence = 4.25)

- All Deposits (NWQMP) are optimally distanced 0km – 0.75km from mafic rocks, peaking at 0-50m (26 dep, Contrast = 1.92, Confidence 9.26) and 50-100m (14dep. Contrast = 2.1, Confidence = 7.6)

- Larger Deposits (NWQMP) are optimally distanced 0-250m (7 dep, Contrast = 1.77, Confidence = 4.09), peaking at 0-10m (3dep, Contrast = 1.91, Confidence = 3.14), 750m – 1.25km, and again at 2.25km-2.5km (3 dep, Contrast = 1.22, Confidence = 2.01). Larger deposits occur both proximal and distal to the mafic bodies.

Faults vs Mineralisation

- **Major Faults:**
  - All Deposits (i.e. large and small, all types) (NWQMP) are optimally spaced within 100m of major faults (23 deposits, Contrast = 1.23, Confidence = 5.63)

  - Larger Deposits are also optimally distanced from major faults within 100m (11 deposits, Contrast = 3.03, confidence = 7.92)
  - Large deposits have a stronger correlation with major faults than smaller deposits

  - Ironoxide Cu Au deposits are optimally distanced 0-100m (6 deposits, Contrast = 2.18, Confidence = 4.75), and again at 1.3km – 1.4km (5 deposits, Contrast = 2.2, Confidence = 4.47)

  - Cu deposits are optimally spaced 500-600m (18dep, Contrast = 1.73, Confidence = 6.82), and also at 0-200m, peaking at 0-100m (12 deposits, Contrast = 1.23, Confidence = 4.06)

  - Au deposits are optimally spaced 500-600m (16 deposits, Contrast = 3.51, Confidence = 10.07) and 0-100m (7 deposits, Contrast = 2.21, Confidence = 5.19. related to either syn-D2, D3 or 1675 Detatchment Fault in Mount Dore/Selwyn Area

- **Medium Faults:**
    - All Deposits (NWQMP) optimally spaced 0-100m (13 deposits, Contrast = 1.24, Confidence = 4.34) and at 300-400m (12 deposits, Contrast = 1.12, Confidence = 3.8)

    - Larger Deposits (NWQMP) show no significant correlation

    - Ironoxide Cu-Au deposits are optimally spaced 0-100m (2 dep, Contrast = 1.53, Confidence = 2.10) and again at 1.3-2.5km, peaking at 2 - 2.25km (3 dep, Contrast = 1.17, Confidence = 1.92)

    - Cu deposits optimally 1.5km from Medium faults (16 dep, Contrast = 2.24, Confidence = 8.42), but also at 0-500m (Contrast 0.91 – 0.37)

    - Au deposits optimally 1.4km to 1.5km (17 dep, Contrast = 4.28, Confidence = 12.287) – Gold deposits closely spatially related to each other – along. They are more closely related to major faults (Mt Dore area).

- **Minor Faults:**
    - Minor faults show no significant trends in relation to mineralisation

Faults that intersect mafic rocks

- Faults that intersect areas of mafic rocks (1km buffers) show the strongest spatial relationship of any geological feature to any deposit type. (8 deposits, Contrast = 7.78, Confidence = 18.73 at 0-250m).

  This is the most significant result of this study, and suggests the possibility that the most important features necessary for IOCG deposition are faults and mafic rocks.

Granites vs Mineralisation

- Granites show no significant correlation with IOCG, Cu, Large or All Deposits. However the Mount Dore granite was found have a significant relationship with Au-only deposits (6 deposits, Contrast = 2.29, Confidence = 5.07 at 1.25–1.5km). However, these 6 deposits are those of the Sewlyn group of deposits, which for the purpose and scale of this study should be considered a single deposit. That being said, there is then no significant relationship between the Au deposits or any of granites studied.

In the context of IOCGs, mafic rocks appear to have an extremely strong spatial relationship to mineralisation. IOCG deposits display a similar strength in spatial relationship to mafics (4 dep, Contrast= 2.24, Confidence = 4.46 at 200-300m) compared to major faults (6 deposits, Contrast = 2.18, Confidence = 4.75 at 0-100m). There are 7 IOCG deposits within 500m of mafics compared to 8 IOCG deposits within 500m of major faults. Most of the IOCG deposits optimally distanced 0-100m from Major faults are concenctrated along the older Mount Dore detatchment Fault, whereas the IOCGs related to mafics are more regionally distributed – providing better exploration opportunities. Importantly, no granites, either collectively or individual suites, were found to have a significant spatial relationship to IOCG mineralization. Faults that intersect area of mafics (Figure 1) provide the best predictors for IOCG deposits. (8 deposits, Contrast = 7.78, Confidence = 18.73 at 0-250m). This infers that mafic rocks may be a much more dominant source of metals and sulphur for these deposits than the granites. Alternatively, pre-emplaced mafic rocks may have provided the required chemically favourable hosts for mineralisation if in fact granites were responsible for the Cu and S bearing fluids.

Additionally, the results indicate that mafic rocks may also be important in the genesis of Cu-deposits and Large deposits, and may act as a source of sulphur and some metals for All deposits.

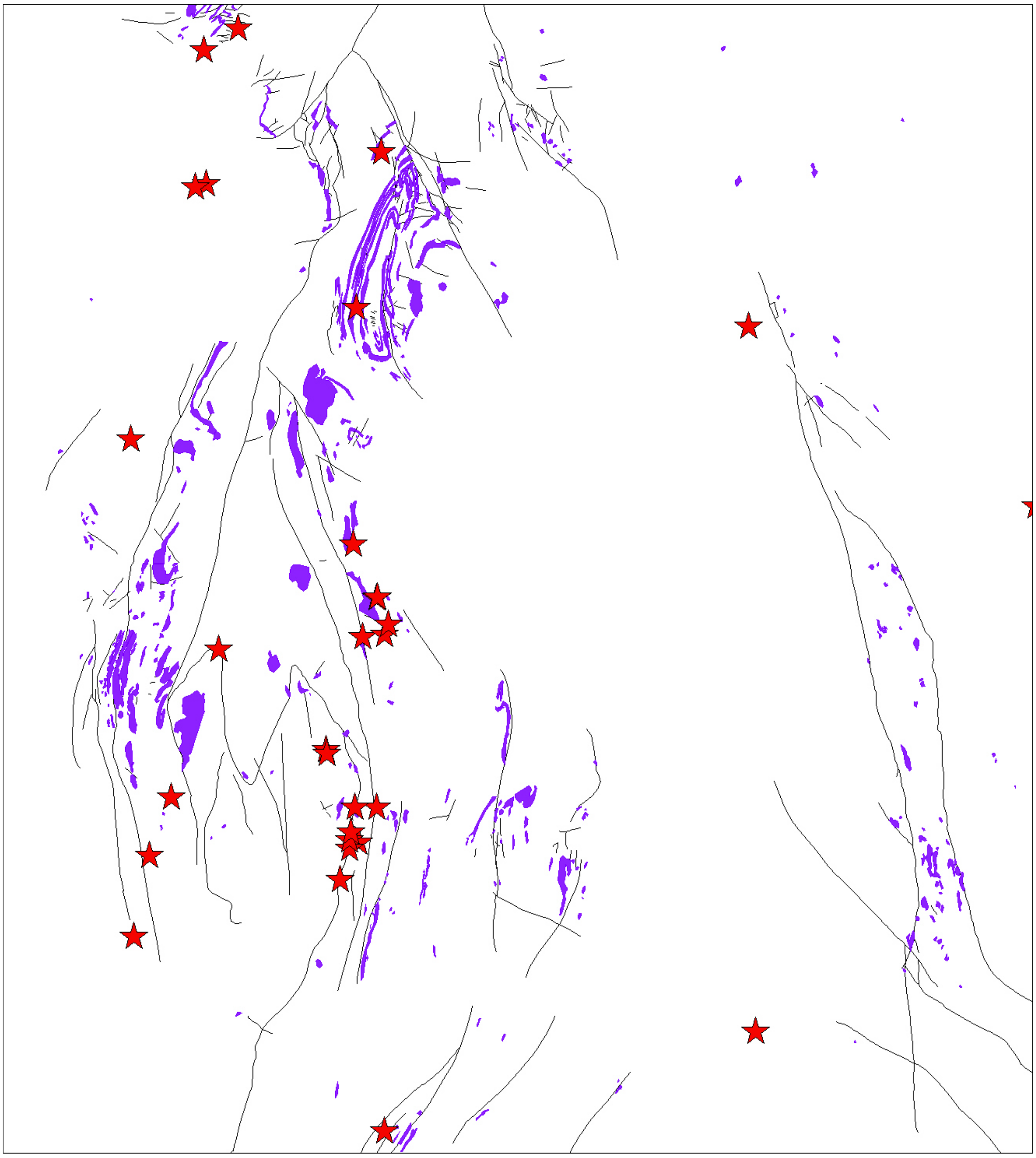

Figure 1 Map of Mafic Rocks (purple), faults that intersect a 1km buffer of those mafic rocks (lines) and IOCG deposits (red stars) in the Angelay Selwyn Sheet study area.

The results obtained in this study concur with the results of other Weights of Evidence studies in the Mount Isa Inlier. Mustard et al (2005) found that of all the lithological units in the whole of the Eastern Succession, mafic intrusives displayed the strongest spatial relationship with IOCG mineralisation. The study also found that granites were a lot less ‘prospective’, or spatially related to, IOCGs than mafics. Ford (2005) confirmed those results, finding a positive spatial association between Cu deposits and mafic intrusives using the NWQMP Report (QLD DME, 2000) geological data. The importance of these results are immense. From an exploration point of view, areas within the Eastern Succession that contain mafic rocks, or faults that intersect mafic rocks, are much more prospective for IOCGs, large, Cu- and Au-deposits, than areas that are mafic absent.

Fractal Analysis

Following Mandelbrot's (1983) hypothesis that minerals in the crust might have fractal distributions, several studies have demonstrated this by applying the box counting technique to analyze the spatial distribution of mineral deposits (e.g. Carlson, 1991; Blenkinsop, 1994; Agterberg et al. 1996; Blenkinsop and Sanderson, 1999). Genetic implications about mineralising systems can be drawn from the box counting fractal dimension, which measures the degree of clustering of the deposits.

In this study the spatial distribution of metal deposits and the distribution of mafic rocks were analysed using binary images in the freeware program ImageJ. An image of the spatial distribution of deposits was produced with each deposit occupying one pixel, and box counting of this image was compared to box counting of a binary image of the distribution of mafic rocks. Box counting was initially performed over a range of box sizes from 0.34 km to 34.2 km. These data showed typical patterns of roll-off at small box sizes. The range of box sizes over which the data were linear was 8.53 km to 34.2km. Regression between these limits was used to derive the fractal dimensions, standard errors of regression and correlation coefficients.

The study area covers a 75.5km x 85.2km region of the Geoscience Australia 1:100 000 Mount Angelay and Selwyn geological sheets. The mineral deposit data were taken from the North West Queensland Mineral Province Report (QLD DME, 2000), and encompass 240 metalliferous mineral deposits (Fig 2). The mafic bodies were delineated by thorough examination of a combination of doleritic units mapped by the authors, other researchers, and the Geoscience Australia mapping program.

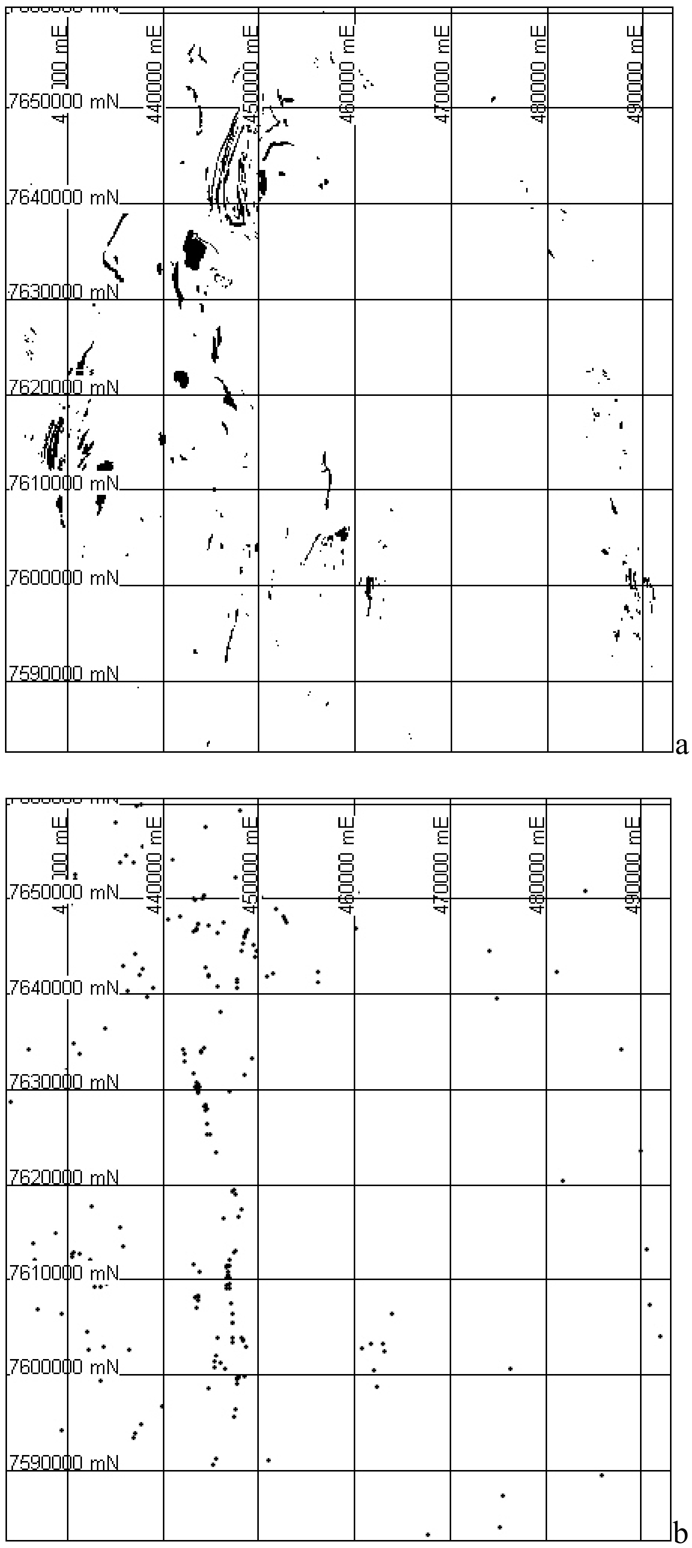

Fig.2) Location of a) mafic rockss and, b) mineral deposits over study area . (Map Grid MGA 94, Zone 54).

The results (Table 2) show that the fractal dimensions of mafic dykes (D = 1.43 ± 0.03) and mineral deposits (D = 1.43 ± 0.04) are effectively identical. Data points on a log-log plot are consistently within error (Fig 3). This means that the degree clustering of mineral deposits over this part of the Eastern Succession is the same as that of mafic rocks, strongly permissive of a genetic relationship between them.

	Regression Limits (km)		Number (Deposits)	Fractal Dimension	Standard Error	Correlation Coefficient
	Min	Max	N	D	E	R
Mafics	8.53	34.2	-	1.43	0.03	0.997221
Deposits	8.53	34.2	240	1.43	0.04	0.99523

Table 2. Results of fractal analysis on mafic dykes and deposits, Eastern Succession.

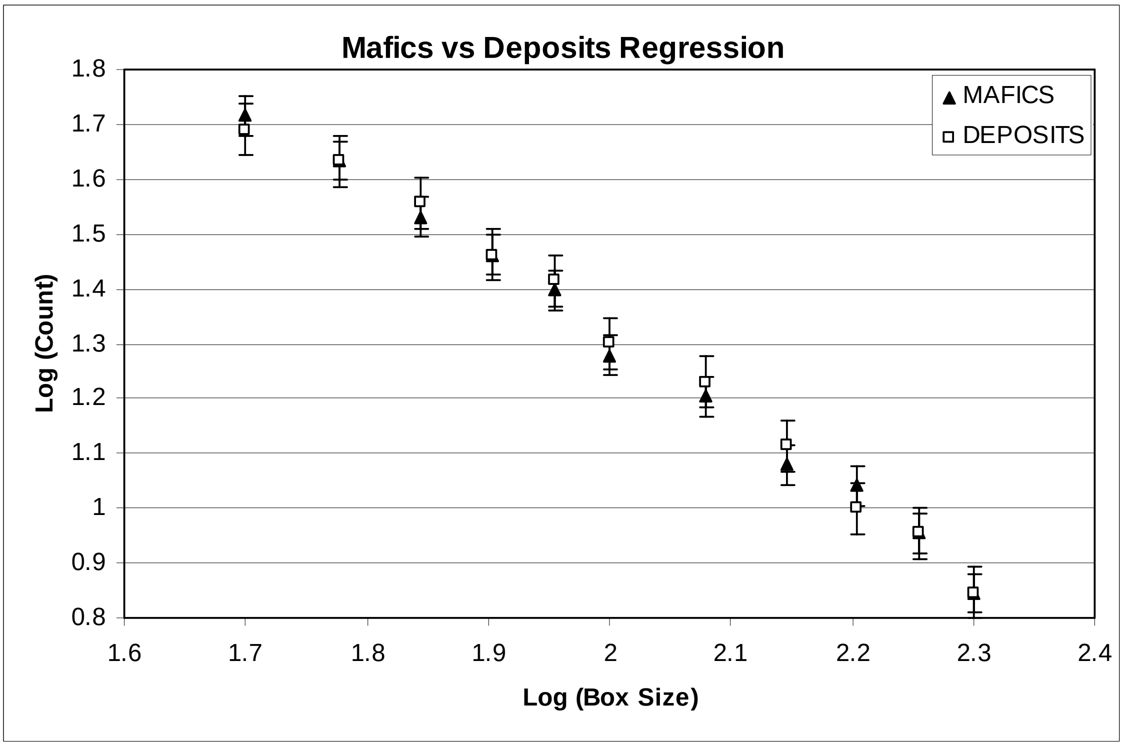

Fig 3 Log(Number of boxes containing mafic rocks/deposits) vs Log(box size) for mafic rocks and metal deposits, Eastern Succession. Error bars show regression error.

The results for the Fractal Analysis study presented here are in strong agreement with those of Ford (2005), where IOCGs within the Eastern Succession were found to have a fractal distribution of 1.423 ± 0.113, well within error of the results obtained for deposits and mafics in this study.

Synthesis of Spatial Analysis

Despite many years of exploration and research focused toward the role of regional granites in the genesis of IOCGs, the results of this spatial analysis leads us to ponder the question of why this was the case when such a strong affinity between mafic rocks, faults and mineralization is evident. Fractal Analysis and Weights of Evidence have proven to be useful tools in the study of prospectivity, and the ranking of key geological features that may be implicated in ore genesis models. According to the studies undertaken here, future emphasis on the role of mafic rocks, as opposed to granites, in the Eastern Succession IOCG province is warranted. The strength of the spatial relationships of mafic rocks to IOCGs and base metal deposits, shown by detailed studies of both Weights of Evidence and Fractal Analysis, is strongly permissive of a genetic relationship between the two, and provides a clearer understanding of the exploration indicators for mineral systems.

Conclusions: Implications for Exploration

In consideration of the strong spatial correlation between mafic rocks and IOCG deposits, it is important to consider these results in any exploration strategy. In particular, the significant difference in spatial relationship between major faults to

IOCG mineralisation, and faults that intersect mafic rocks to IOCG mineralisation, highlight the critical role of mafics in the ore deposition process. Aditionally, mafic rocks have the same fractal distribution as mineral depositions within the study area. Whether it be that the mafic rocks have acted as chemical or mechanical traps for ore minerals to precipitate, or that they have directly contributed to mineralisation via either fractionation processes or later scavenging by metamorphic fluids (Chapter 2), their presence is a crucial indicator for the potential for mineralisation to exist in a given area. This is in contrast to the Williams-Naraku Batholith of felsic to intermediate magmas, that display no significant spatial relationship to mineralisation at the studied scale.

Given the recent disappointing exploration results for IOCGs in the Eastern Succession, and the accompanying acceptance of both genetic and exploration models for IOCGs relying heavily on a felsic magmatic involvement, it may be appropriate in future exploration to consider the role of mafic rocks in ore genesis in order to increase ore discovery rates.

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CONCLUSIONS

The main conclusions from the work contained herein are:

1. There may exist an old (pre-1860Ma) crustal/mantle boundary between the Eastern and Western Successions of the Mount Isa Inlier. Variation of geochemical indicators and crustal thickness during the Palaeo-Mesoproterozoic between the Eastern Domain (Mount Isa Eastern Succession, Curnamona Province and Georgetown Inlier) and the Western Domain (Mount Isa Western Succession, Kalkadoon-Leichardt Belt and McArthur River Basin) supports this. Additionally, regional scale metallogenesis is consistent with a major intra-Isa Block boundary.

2. Mafic rocks probably contributed significantly to the accumulated metal budget of the Mount Isa Eastern Succession, via primary (1690Ma-1650Ma fractionation-exsolution) and secondary (~1600Ma-1590Ma) metamorphic leaching processes.

3. Previous genetic and exploration models for IOCG deposits in the Eastern Succession failed to adequately account for the potential for mafic rocks and magmas to have contributed significantly to mineralising processes.

4. The spatial association of mafic rocks, and faults that intersect areas of mafic rocks, to IOCG mineralisation are the strongest of any geological/lithological

units to mineralisation. This is a particularly important point mineral exploration targeting. Additionally, felsic rocks, those that have been considered important in exploration targeting over recent years, show no significant spatial relationship to IOCG mineralisation. These results also add weight to the results of the geochemical studies that highlight the potential involvement of mafics in Eastern Succession mineralisation processes.

Appendix I

JCU Samples List

JCU Sample Collection

*No residual Rock portions remain. Thin sections not available.

KB #	Lab #	Location	Easting	Northing	Description	Thin Section Available
M1	5963-01	Snake Creek	462483	7685008	Pre-D1 Layered Gabbro	No
M2	5963-02	Snake Creek	462585	7685025	Pre-D1 Gabbro	No
M3	5963-03	Snake Creek	462731	7684957	Pre-D1 Unaltered Tonalite	No
M4	5963-04	Snake Creek	462730	7685003	Pre-D1 Gabbro-Tonalite Hybrid	No
M5	5963-05	Snake Creek	462730	7685003	Pre-D1 Hybrid Gabbro-Tonalite	No
M7	5963-06	Snake Creek	462913	7684965	Pre-D1 Gabbro	No
M8	5963-07	Snake Creek	464661	7684125	Syn-D2 Dolerite	No
M9	5963-08	" "	"	"	As above, less altered	No
M11	5963-09	Snake Creek	458571	7689444	Late fresh Gabbro	No
M12	5963-10	Snake Creek	459030	7694414	Pre-D1 Dolerite	No
M13	5963-11	Snake Creek	461791	7694429	Pre-D1 Dolerite	No
M14	5963-12	Snake Creek	462951	7694451	Pre-D1 Dolerite	No
M22	5963-13	lary Kathleen F	397328	7699848	Amphibolite	No
M23	5963-14	lary Kathleen F	397397	7699748	Amphibolite	No
M24	5963-15	lary Kathleen F	397369	7699786	Amphibolite	No
M28	5963-16	Lunch Creek	402719	7709427	Lunch Creek Gabbro?	No
M32	5963-17	Lunch Creek	402493	7709279	Lunch Creek Gabbro?	No
T 1	6332-01	Kuridala Area	446336	7646611	Pre-D1 Dolerite	No
T 2	6332-02	Kuridala Area	446900	7646232	Pre-D1 Dolerite	No
T 3	6332-03		486058	7652762	Dolerite	No
T 5	6332-04	est of Snake Cre	458355	7688946	Altered Dolerite Dyke (Late)	No
T 6	6332-05	" "	"	"	"	No
T 8	6332-06	Snake Creek	458324	7689062	Syn-D2 Dolerite	No
T 9	6332-07	Snake Creek	464313	7684628	Syn-D2 Dolerite	No
T 10	6332-08	Snake Creek	463811	7684318	Syn-D2 Dolerite	No
T 11	6332-09	Snake Creek	464709	7684118	Syn-D2 Dolerite	No
T 12A	6332-10	Snake Creek	678751	467874	Syn-D2 Dolerite	No
T 12B	6332-11	Snake Creek	678751	467874	Syn-D2 Dolerite	No
T 14A	6332-12	Snake Creek	468174	7678068	Syn-D2 Dolerite	No
T 14B	6332-13	Snake Creek	468174	7678068	Syn-D2 Dolerite	No
T 15	6332-14	Snake Creek	466462	7678257	Syn-D2 Dolerite	No
T 16	6332-15	Snake Creek	466260	7681955	Syn-D2 Dolerite	No
T 17	6332-16	Snake Creek	466059	7682087	Syn-D2 Dolerite	No
T 19	6332-17	est of Snake Cre	458470	7689000	Late Dolerite	No

Appendix II

MAFIC GEOCHEMISTRY DATABASE

(AVAILABLE ONLY IN DIGITAL FORMAT)

KB Data

Advanced Analytical Centre
James Cook University
Townsville Qld 4811
Tel. (ISD) 617 47814599 (STD) 07 47814599
Fax. (ISD) 617 47815550 (STD) 07 47815550

Method : ACXRF001

JOB NO. 5963-04

Client **K. Butera**

SAMPLE	Analyte	SiO2	TiO2	Al2O3	Fe2O3T	MnO	MgO	CaO	Na2O	K2O	P2O5	SO3	LOI	SUM
	LINE	KA1,2	KA1,2	KA1,2	KA1,2	KA1,2	KA1,2	KA1,2	KA1,2	KA1,2	KA1,2	KA1,2		
	CRYSTAL	InSb	LIF100	PET	LIF100	LIF100	OVO55	LIF100	OVO55	LIF100	GE	GE		
	KV	40	50	40	50	50	40	50	30	50	40	40		
	mA	60	50	60	50	50	60	50	90	50	60	60		
	TIME(SEC)	45	90	65	90	90	40	50	65	25	35	240		
	UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%
SAMPLE	LAB #													
M1	5963-01	46.7	1.67	17.0	15.5	0.21	4.72	9.88	2.95	0.59	0.11	bd	0.72	100.1
M2	5963-02	48.6	1.41	13.6	15.8	0.22	6.85	9.36	3.00	0.66	0.12	0.03	0.72	100.3
M3	5963-03	71.4	0.41	12.4	5.65	0.08	0.88	2.09	6.09	0.31	0.08	bd	0.38	99.8
M4	5963-04	54.1	2.08	13.0	16.5	0.22	2.36	5.37	4.83	0.43	0.23	bd	bd	99.2
M5	5963-05	45.5	2.47	11.6	23.5	0.40	5.41	7.42	2.36	0.54	0.12	0.07	bd	99.4
M7	5963-06	47.0	1.69	13.2	20.9	0.34	5.59	7.80	3.13	0.40	0.15	bd	0.04	100.2
M8	5963-07	48.5	1.19	13.9	13.9	0.21	7.19	10.8	2.65	1.15	0.12	0.01	1.13	100.7
M9	5963-08	47.6	1.11	13.9	13.3	0.19	7.49	11.0	2.39	1.37	0.10	0.02	1.52	100.0
M11	5963-09	47.4	2.13	12.2	18.9	0.21	5.04	8.58	2.95	1.04	0.15	0.03	0.68	99.4
M12	5963-10	45.9	2.74	13.4	18.2	0.34	2.94	9.70	3.55	0.52	0.25	0.03	1.78	99.4
M13	5963-11	49.1	1.19	13.7	14.0	0.25	7.92	11.3	1.59	0.25	0.10	0.15	0.91	100.4
M14	5963-12	49.6	1.07	14.3	12.9	0.23	7.85	11.7	1.89	0.28	0.09	0.10	0.97	100.9
M22	5963-13	46.2	1.56	13.8	12.0	0.17	5.53	16.7	2.00	0.12	1.08	0.03	1.55	100.7
M23	5963-14	45.0	1.18	10.1	15.2	0.30	8.84	14.5	1.39	1.47	0.81	0.11	0.77	99.7
M24	5963-15	43.4	1.45	10.1	17.3	0.33	8.19	14.3	1.32	1.52	1.18	0.06	0.91	100.0
M28	5963-16	50.1	1.06	15.1	12.3	0.17	6.61	10.4	2.74	0.78	0.11	0.06	0.81	100.1
M32	5963-17	55.6	1.36	14.4	11.3	0.14	3.44	6.60	2.90	2.95	0.29	0.03	0.63	99.6

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Method : ACXRF002

JOB NO. 0

Client **0**

ELEMENT	**Sc**	**Ba**	**Ti**	**V**	**Cr**	**Mn**	**Co**	**Ni**	**Cu**	**Zn**	**Ga**	**As**	**Pb**	**Rb**	**Sr**	**Y**	**Zr**	**Nb**	**Th**	**U**
Max (ppm)	55	4000	22600	526	4000	2500	210	2360	2360	290	40	330	133	1300	700	720	490	268	1003	650
LLD (ppm)	3	10	5	4	3	4	2	3	3	3	3	10	10	2	2	2	3	2	3	3

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
60		Overlaps	Ca	Ce,Ti	Ba	Ba,Ti	V,La	Cr	Fe,Sr	Y	Sr,Th			Pb		U		Rb,Pb	Sr,Ba Th	Y,La U,Th	Bi, Rb	Rb, Sr
61		**UNITS**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**
62	**SAMPLE**	**LAB #**																				
63																						
64	M1	5963-01	**36**	**106**	**9800**	**549**	**bd**	**1563**	**50**	**67**	**207**	**73**	**20**	bd	28	**25**	**127**	**25**	**57**	**3**	**bd**	**bd**
65	M2	5963-02	**46**	**95**	**9198**	**361**	**145**	**1765**	**54**	**96**	**84**	**69**	**19**	bd	25	**27**	**96**	**29**	**82**	**5**	**bd**	**bd**
66	M3	5963-03	**14**	**31**	**2664**	**8**	**61**	**556**	**31**	**6**	**1**	**bd**	**22**	5	bd	**bd**	**33**	**99**	**303**	**23**	**bd**	**bd**
67	M4	5963-04	**42**	**34**	**11818**	**61**	**44**	**1536**	**39**	**13**	**18**	**32**	**25**	bd	20	**bd**	**66**	**57**	**219**	**13**	**bd**	**bd**
68	M5	5963-05	N.A.	**55**	**11251**	**665**	**487**	**2811**	**63**	**30**	**9**	**46**	N.A.	bd	1	**10**	**48**	**44**	**94**	**4**	**bd**	**bd**
69	M7	5963-06	**44**	**26**	**10493**	**474**	**1**	**2623**	**39**	**73**	**19**	**52**	**24**	bd	33	**9**	**93**	**43**	**87**	**6**	**bd**	**bd**
70	M8	5963-07	**46**	**237**	**7530**	**305**	**114**	**1705**	**89**	**85**	**79**	**38**	**19**	bd	35	**59**	**136**	**25**	**76**	**5**	**bd**	**bd**
71	M9	5963-08	**45**	**83**	**6969**	**303**	**99**	**1552**	**54**	**104**	**102**	**67**	**19**	bd	28	**94**	**119**	**22**	**61**	**4**	**bd**	**bd**
72	M11	5963-09	**48**	**130**	**13186**	**481**	**bd**	**1640**	**58**	**37**	**269**	**43**	**22**	bd	32	**33**	**161**	**34**	**109**	**7**	**bd**	**bd**
73	M12	5963-10	**44**	**468**	**17128**	**327**	**bd**	**2555**	**47**	**20**	**26**	**45**	**29**	bd	34	**bd**	**152**	**61**	**192**	**13**	**bd**	**bd**
74	M13	5963-11	**44**	**6**	**7828**	**327**	**207**	**1979**	**58**	**114**	**185**	**88**	**17**	bd	27	**bd**	**188**	**24**	**63**	**3**	**bd**	**bd**
75	M14	5963-12	**44**	**23**	**6506**	**317**	**240**	**1777**	**52**	**120**	**169**	**98**	**18**	14	36	**bd**	**186**	**23**	**55**	**3**	**bd**	**bd**
76	M22	5963-13	**34**	**19**	**9471**	**232**	**84**	**1363**	**27**	**40**	**22**	**9**	**20**	2	32	**bd**	**652**	**34**	**56**	**13**	**bd**	**bd**
77	M23	5963-14	**29**	**563**	**7461**	**351**	**42**	**2441**	**56**	**81**	**85**	**54**	**15**	bd	34	**109**	**401**	**25**	**54**	**9**	**bd**	**bd**
78	M24	5963-15	**29**	**318**	**9130**	**393**	**40**	**2646**	**58**	**81**	**133**	**51**	**17**	bd	39	**132**	**378**	**29**	**49**	**8**	**bd**	**bd**
79	M28	5963-16	**45**	**150**	**6633**	**300**	**209**	**1355**	**48**	**76**	**204**	**34**	**20**	bd	21	**32**	**146**	**24**	**69**	**5**	**bd**	**bd**
80	M32	5963-17	**25**	**585**	**8591**	**223**	**4**	**1050**	**49**	**46**	**93**	**68**	**21**	bd	33	**152**	**174**	**42**	**321**	**18**	**bd**	**bd**

Advanced Analytical Centre
James Cook University
Townsville Qld 4811
Tel. (ISD) 617 47814599 (STD) 07 47814599
Fax. (ISD) 617 47815550 (STD) 07 47815550

Method : ACXRF001

JOB NO. Kris Butera

Client **6332-04**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
96		Analyte	**SiO2**	**TiO2**	**Al2O3**	**Fe2O3T**	**MnO**	**MgO**	**CaO**	**Na2O**	**K2O**	**P2O5**	**SO3**	**LOI**	**SUM**
97		LINE	KA1,2	KA1,2	KA1,2	KA1,2	KA1,2	KA1,2	KA1,2	KA1,2	KA1,2	KA1,2	KA1,2		
98		CRYSTAL	InSb	LIF100	PET	LIF100	LIF100	OVO55	LIF100	OVO55	LIF100	GE	GE		
99		KV	40	50	40	50	50	40	50	30	50	40	40		
100		mA	60	50	60	50	50	60	50	90	50	60	60		
101		TIME(SEC)	45	90	65	90	90	40	50	65	25	35	240		
102		UNITS	%	%	%	%	%	%	%	%	%	%	%	%	%
103															
104	SAMPLE	LAB #													
105															
106	T 1	6332-01	48.8	0.86	16.0	11.3	0.18	8.13	12.3	2.08	0.33	0.07	bd	1.09	101
107	T 2	6332-02	48.6	0.96	14.4	13.0	0.20	7.81	11.7	1.86	0.80	0.07	0.03	1.33	100.8
108	T 3	6332-03	52.1	3.08	12.0	13.7	0.20	2.85	13.9	1.81	0.40	0.05	0.02	0.35	100.6
109	T 5	6332-04	47.7	1.09	15.3	11.8	0.12	7.90	8.64	3.68	2.05	0.09	0.04	1.49	99.8
110	T 6	6332-05	47.7	1.13	15.0	13.5	0.20	7.94	9.29	2.16	1.87	0.09	0.02	1.67	100.6
111	T 8	6332-06	48.6	1.27	14.8	13.7	0.20	7.54	10.0	2.71	0.87	0.10	0.05	1.04	100.8
112	T 9	6332-07	50.0	1.31	14.7	13.7	0.19	6.45	10.2	2.48	0.97	0.14	0.02	0.80	100.9
113	T 10	6332-08	50.3	1.02	14.2	13.5	0.20	6.81	9.46	2.99	1.14	0.10	0.03	1.00	100.7
114	T 11	6332-09	49.6	1.20	14.7	13.1	0.17	6.81	10.9	3.03	0.64	0.13	0.01	0.71	101.0
115	T 12A	6332-10	48.9	1.36	14.2	13.6	0.21	6.87	10.4	2.85	1.03	0.13	0.05	0.84	100.5
116	T 12B	6332-11	49.3	1.42	13.8	13.6	0.22	7.03	10.4	2.86	1.21	0.12	0.02	0.94	100.9
117	T 14A	6332-12	49.3	1.44	13.8	14.2	0.21	6.89	9.51	2.40	1.66	0.13	0.02	1.41	100.9
118	T 14B	6332-13	49.3	1.42	13.7	13.9	0.16	6.70	9.91	2.79	1.12	0.14	bd	1.44	100.6
119	T 15	6332-14	49.6	1.23	14.5	13.8	0.21	7.19	11.8	2.33	0.24	0.12	0.02	bd	101

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
120	T 16	6332-15	50.4	1.05	13.6	15.3	0.31	6.97	10.3	1.92	0.39	0.08	bd	0.52	100.8							
121	T 17	6332-16	48.6	1.96	13.4	17.4	0.28	5.51	9.89	2.55	0.51	0.13	bd	0.35	100.5							
122	T 19	6332-17	46.7	1.74	14.6	16.1	0.20	5.83	10.3	2.91	1.22	0.08	0.03	1.15	100.8							
123																						

124 Advanced Analytical Centre
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127 Tel. (ISD) 617 47814599 (STD) 07 47814599
128 Fax. (ISD) 617 47815550 (STD) 07 47815550

129
130
131 Method : ACXRF002 **JOB NO.** 0
132
133 **Client** 0
134

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
135		**ELEMENT**	**Sc**	**Ba**	**Ti**	**V**	**Cr**	**Mn**	**Co**	**Ni**	**Cu**	**Zn**	**Ga**	**As**	**Pb**	**Rb**	**Sr**	**Y**	**Zr**	**Nb**	**Th**	**U**
136		**Max (ppm)**	**55**	**4000**	**22600**	**526**	**4000**	**2500**	**210**	**2360**	**2360**	**290**	**40**	**330**	**133**	**1300**	**700**	**720**	**490**	**268**	**1003**	**650**
137		**LLD (ppm)**	**3**	**10**	**5**	**4**	**3**	**4**	**2**	**3**	**3**	**3**	**3**	**10**	**10**	**2**	**2**	**2**	**3**	**2**	**3**	**3**
138		Overlaps	Ca	Ce,Ti	Ba	Ba,Ti	V,La	Cr	Fe,Sr	Y	Sr,Th			Pb		U		Rb,Pb	Sr,Ba Th	Y,La U,Th	Bi, Rb	Rb, Sr
139		**UNITS**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**	**ppm**
140	**SAMPLE**	**LAB #**																				
141	T 1	6332-01	**42**	**81**	**4877**	**278**	**214**	**1443**	**57**	**132**	**184**	**76**	**18**	bd	22	**18**	**150**	**19**	**44**	**3**	**bd**	**bd**
142	T 2	6332-02	**50**	**115**	**5608**	**304**	**194**	**1692**	**62**	**103**	**222**	**114**	**18**	bd	27	**57**	**101**	**20**	**43**	**4**	**bd**	**bd**
143	T 3	6332-03	**40**	**91**	**19475**	**592**	**bd**	**1495**	**28**	**18**	**27**	**69**	**23**	bd	41	**15**	**489**	**44**	**163**	**6**	**bd**	**bd**
144	T 5	6332-04	**30**	**148**	**7080**	**264**	**118**	**791**	**59**	**141**	**104**	**17**	**16**	bd	21	**123**	**148**	**22**	**59**	**4**	**bd**	**bd**
145	T 6	6332-05	**35**	**100**	**7062**	**282**	**143**	**1542**	**64**	**144**	**154**	**93**	**20**	bd	25	**109**	**158**	**22**	**57**	**5**	**bd**	**bd**
146	T 8	6332-06	**35**	**117**	**8697**	**298**	**138**	**1533**	**64**	**124**	**169**	**87**	**20**	bd	27	**46**	**181**	**25**	**76**	**5**	**bd**	**bd**
147	T 9	6332-07	**40**	**256**	**8129**	**284**	**75**	**1467**	**49**	**73**	**55**	**39**	**21**	bd	25	**60**	**184**	**28**	**87**	**6**	**bd**	**bd**
148	T 10	6332-08	**45**	**71**	**5768**	**291**	**35**	**1645**	**53**	**73**	**102**	**61**	**18**	bd	25	**77**	**109**	**24**	**70**	**6**	**bd**	**bd**
149	T 11	6332-09	**41**	**99**	**7248**	**302**	**100**	**1280**	**48**	**79**	**48**	**32**	**20**	bd	25	**24**	**176**	**25**	**69**	**5**	**bd**	**bd**
150	T 12A	6332-10	**41**	**137**	**8571**	**337**	**124**	**1662**	**57**	**96**	**156**	**102**	**21**	bd	31	**86**	**155**	**25**	**79**	**7**	**bd**	**bd**
151	T 12B	6332-11	**40**	**118**	**8721**	**317**	**139**	**1584**	**60**	**92**	**136**	**88**	**20**	bd	30	**96**	**160**	**26**	**83**	**7**	**bd**	**bd**
152	T 14A	6332-12	**41**	**123**	**8450**	**315**	**134**	**1601**	**51**	**89**	**160**	**84**	**22**	bd	33	**159**	**164**	**27**	**83**	**6**	**bd**	**bd**
153	T 14B	6332-13	**44**	**433**	**8468**	**307**	**149**	**1307**	**55**	**93**	**125**	**39**	**19**	bd	25	**58**	**152**	**32**	**104**	**8**	**bd**	**bd**
154	T 15	6332-14	**39**	**66**	**8079**	**298**	**80**	**1534**	**58**	**91**	**140**	**94**	**19**	bd	26	**bd**	**147**	**26**	**76**	**4**	**bd**	**bd**
155	T 16	6332-15	**47**	**17**	**7034**	**326**	**96**	**2466**	**50**	**90**	**41**	**120**	**20**	bd	29	**12**	**101**	**26**	**64**	**4**	**bd**	**bd**
156	T 17	6332-16	**45**	**82**	**12738**	**475**	**bd**	**2151**	**53**	**51**	**169**	**115**	**21**	bd	33	**21**	**125**	**32**	**93**	**7**	**bd**	**bd**
157	T 19	6332-17	**48**	**111**	**11562**	**616**	**44**	**1594**	**66**	**112**	**500**	**70**	**22**	bd	30	**62**	**181**	**20**	**56**	**4**	**bd**	**bd**
158																						

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
159		Mg	Al	Sc	Ti	V	Cr	Co	Ni	Cu	Zn	Ga	As	Se	Rb	Sr	Y	Zr	Nb	Mo	Pd	Ag
160	Sample name	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
161	5963-01	11230	47830	36.94	10750	715.5	56.67	55.36	70.06	173.6	108.3	24	1.65	0	20.36	120.9	20.63	30.45	3.33	0.49	0.71	0.4
162	5963-02	16700	39000	45.27	8945	526.9	176.1	58.99	96.05	73.35	104.2	21.57	1.14	2.28	22.31	90.75	24.53	48.9	3.49	0.37	0.59	0.37
163	5963-03	2223	26680	12.34	2602	111.4	15.6	27.64	14.48	10.22	47.04	22.21	2.55	3.24	3.6	30.61	81.85	196.2	18.2	0.26	1.37	0.6
164	5963-04	5691	38190	42.2	13860	158.1	12.29	43.92	11.3	19.03	73.53	25.35	1.67	0	4.72	63.29	52.01	119.7	10.64	0.28	0.98	0.45
165	5963-05	13350	32840	50.27	15930	879.5	12.81	59.68	42.89	20.96	93.46	25.18	0.56	0	9.21	50.88	38.21	59	4.59	0.36	0.7	0.33
166	5963-06	13350	37830	42.76	10550	723.7	61.62	53.54	67.85	12.47	86.01	22.81	1.09	0.19	5.95	86.04	36.41	73.64	4.74	0.49	0.77	0.34
167	5963-07	17560	38380	40.67	7127	343.7	104.7	80.92	286.9	61.87	624.2	25.65	0.4793	3.392	51.45	128.7	21.43	33.4	3.682	0.6418	0.5691	0.1707
168	5963-08	17940	40100	42.47	7004	405.7	113.7	61.29	158.9	105.7	198.9	20.25	1.15	0	84.27	113.9	19.54	25.01	3.28	1.17	0.62	0.23
169	5963-09	12460	35820	45.56	12790	688.4	30.55	65.11	131.3	271.3	266.4	26.34	2.08	0	27.68	146.7	28.83	88.05	5.76	1.04	0.89	0.46
170	5963-10	7206	39340	45.4	18320	491.6	26.04	55.51	87.73	28.62	222.2	44.72	0	0	5.17	147	54.78	121.6	11.51	0.95	1.14	0.39
171	5963-11	19610	40920	46.53	7673	474.5	218.3	64.24	178.6	198.4	229.7	17.38	8.78	0	4.58	184	20.7	19.32	3.06	0.87	0.76	0.27
172	5963-12	19380	41820	46.03	6837	453.6	240.1	57.47	205.9	203.5	293.1	17.7	25.35	0.07	3.69	178.1	19.09	21.55	2.75	1.13	0.73	0.27
173	5963-13	13680	38370	25.47	10260	331.4	62.29	28.97	60.77	15.2	104.9	18.4	11.03	0.54	1.72	639.8	30.88	35.94	11.9	1.08	2	0.22
174	5963-14	21090	28380	28.14	7175	424.8	65.4	58.26	87.04	69.14	106.3	35.65	8.28	0	98.99	383.7	20.71	24.58	7.25	0.87	1.13	0.22
175	5963-15	19680	28740	25.84	8999	494.2	52.36	62.76	83.17	109.6	100.8	25.61	9.07	0	113.8	355.2	24.69	24.6	7.49	0.84	1.25	0.28
176	5963-16	16720	42480	44.08	6335	354.6	186.1	48.63	182	180.4	336.7	22.87	0.4363	2.88	27.9	135.6	20.55	19	3.606	0.5054	0.5542	0.1438
177	5963-17	8293	41880	25.96	8489	322.5	20.22	49.06	48.97	93.21	117.3	43.56	2.82	3.61	143.8	169.1	36.22	228.5	16.18	1.07	0.95	0.56

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
178	5963-17-01	8303	41540	25.77	8544	329.4	22.33	49.08	62.36	96.29	134.9	43.39	2.3	2.14	143.5	169.6	35.66	223.8	15.79	1.22	0.97	0.55
179	BLANK	325.9	241	0.28	49.44	117.7	16.12	0.55	40.57	8.9	77.26	0.41	0.21	3.5	0.36	4.12	0.17	0.33	0.04	0.35	0.02	0.22
180	CNPC	3026	3478	1.19	244.3	63.43	465.3	1113	73810	3418	255.4	3.64	92.03	11.1	5.56	14	2.19	14	0.96	8.55	0.62	2.32
181	MIITEL1	27440	13350	15.1	1340	166	803.9	937.9	25600	4454	149.8	7.06	967.9	25.56	5.36	52.27	4.52	9.61	0.65	1.19	1.14	2.68
182																						
183	Attn :	Sharon Ness																				
184																						
185	Job No :	JCU-ACC-0009																				
186	Cust Ref :	41004																				
187	Report Id :																					
188	Project :																					
189																						
190																						
191			JCU_PWD	JCU_PW	JCU_PWDR	JCU_PW	JCU_PW	JCU_PW	JCU_PW	JCU_PW	JCU_PW	JCU_PW	JCU_PW	JCU_PW	JCU_PW	JCU_PWD	JCU_PWD	JCU_PWD	JCU_PWD	JCU_PWD	JCU_PWD	JCU_PWD
192			Be	Bi	Ca	Cd	Hg	Li	Sb	Se	Sn	Rb	Sr	Y	Zr	Cs	Ba	La	Ce	Pr	Nd	Sm
193			0.01	0.01	5	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
194	Customer Sample ID		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
195	6332-01	T 1	0.38	0.06	73570	1.89	1.86	8.55	0.19	15.46	0.58	11.45	131.8	13.14	9.21	0.27	38.88	3.03	7.48	0.83	7.31	1.83
196	6332-02	T 2	0.37	0.02	77158	<0.01	1.76	9.51	1.35	15.47	1.1	51.31	99.8	17.56	18.14	2.14	103.28	3.22	8.92	0.86	7.52	2.63
197	6332-03	T 3	1.37	0.4	118196	2.53	6.06	12.8	1.62	<0.01	4.8	46.49	435.8	50.23	101.89	0.52	385.08	12.82	28.4	2.88	24.84	8.09
198	6332-04	T 5	0.62	0.04	56160	0.96	2.57	17.01	1.06	14.42	0.59	105.11	140.2	17.79	58.23	3.05	134.88	7.16	16.68	1.51	12.48	4.29
199	6332-05	T 6	0.41	0.03	59093	0.83	1.63	16.67	0.46	21.14	1	86.12	140.3	16.94	48.37	0.87	90.61	5.71	13.69	1.22	9.85	2.93
200	6332-06	T 8	0.56	0.01	57502	<0.01	1.99	8.82	<0.01	23.03	0.09	30.97	147.9	18.74	58.48	0.76	87.88	6.47	15.01	1.31	11.05	3.34
201	6332-07	T 9	0.83	0.2	64314	<0.01	1.56	4	0.6	<0.01	2.28	53.6	180.1	26.4	44.6	0.17	247.08	6.18	15.68	1.45	12.95	4.38
202	6332-08	T 10	0.5	0.17	60102	<0.01	1.85	5.2	0.3	10.48	4.14	61.58	97.65	18.82	39	0.36	65.33	7.18	16.68	1.33	11.64	2.65
203	6332-09	T 11	0.58	0.13	68484	<0.01	2.25	7.34	0.56	17.76	1.17	19.73	170.4	22.69	42.14	0.16	106.78	6.84	18.91	1.51	13.05	3.35
204	6332-10	T 12A	0.57	0.89	61017	<0.01	1.06	5.3	0.83	13.04	0.72	6.64	87.48	20.34	20.43	0.19	25.65	3.84	8.6	0.83	9.02	2.46
205	6332-11	T 12B	0.52	0.1	68120	1.78	1.96	7.91	0.21	17.56	1.3	77.73	146.7	22.23	68.46	0.86	109.88	9.04	19.54	1.61	14.61	4.39
206	6332-12	T 14A	0.67	0.1	55640	<0.01	1.61	6.93	0.15	11.33	0.23	104.11	122.8	19.73	60.04	0.9	93.98	7.65	17.97	1.58	13.07	3.81
207	6332-13	T 14B	0.86	0.16	83782	1.74	2.58	8.9	0.81	17.57	1.32	95.76	190.8	28.32	68.12	1.33	176.38	10.24	23.63	2.07	17.08	5.89
208	6332-14	T 15	0.23	0.02	76482	0.31	2.14	4.47	0.03	18.05	<0.01	3.6	138.9	23.17	40.28	0.19	53.41	6.22	14.43	1.33	12.96	3.87
209	6332-15	T 16	0.35	0.11	57242	<0.01	2.28	12.07	0.27	20.58	0.64	44.27	145.1	14.99	29.19	0.2	91.74	5.06	11.52	1.08	8.9	2.12
210	6332-16	T 17	0.61	0.26	65967	1.34	1.49	8.74	0.64	6.18	1.01	17.57	120.8	29.14	43.85	0.19	85.49	7.51	17.46	1.4	13.97	3.6
211	6332-17	T 19	0.49	0.41	81931	0.95	4.09	8.6	1.03	<0.01	4.01	10.76	357.9	32.02	78.01	0.34	46.09	4.89	12.02	1.28	11.77	3.94
212																						
213	***Analabs Fire Assay & ICP***																					
214	TV053319	17	66																			
215	201482	/ 5963-0406(	Au(R)	Au(S)	Cu	S																
216	UNITS	ppm	ppm	ppm	ppm	ppm																
217	DETECTION	0.001	0.001	0.001	5	50																
218	METHOD	F651	F651	F651	I104	I104																
219	CO																					
220	CO																					
221	M1	0.01	-	-	211	390																
222	M2	0.009	-	-	132	310																
223	M3	X	-	-	36	130																
224	M4	X	-	-	74	225																
225	M5	0.001	X	-	97	290																
226	M7	0.008	-	-	92	285																
227	M8	0.008	-	-	121	430																
228	M9	0.013	-	-	166	1480																
229	M11	0.013	-	-	283	1950																
230	M12	0.011	-	-	101	440																
231	M13	0.011	-	-	234	1320																
232	M14	0.009	-	-	230	720																
233	M22	0.011	-	-	99	320																
234	M23	0.009	-	-	134	815																
235	M24	0.001	-	-	170	510																
236	M28	0.003	-	-	234	355																

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
237	M32	0.006	0.009	-	131	410																
238																						
239	***Analabs Fire Assay & ICP***																					
240	TV054237 17	50																				
241	0000201524 17	Cu	S	Au																		
242	METHOD	I104	I104	F651																		
243	LDETECTION	5	50	0.001																		
244	UDETECTION	10000	200000	1000																		
245	UNITS	ppm	ppm	ppm																		
246	T1	138	945	0.017																		
247	T2	201	1540	0.027																		
248	T3	<	60	0.019																		
249	T5	83	830	0.001																		
250	T6	130	830	0.001																		
251	T8	145	950	<																		
252	T9	31	<	<																		
253	T10	84	110	0.007																		
254	T11	26	<	<																		
255	T12A	141	1370	0.007																		
256	T12B	101	1530	<																		
257	T14A	137	1420	0.007																		
258	T14B	103	85	<																		
259	T15	128	1420	<																		
260	T16	24	<	<																		
261	T17	152	<	0.003																		
262	T19	496	1440	<																		
263																						
264																						
265																						
266																						
267																						
268																						
269																						
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280																						
281																						
282	**Data from Publications and Theses**																					
283																						
284	MD#	Original #	JCU #	Analysis	Element	Original F	Original F	Collectior	Rock Typ	Rock Nar	Area (or :	Location	Location	Location	Un/Altere	Alt Type	Age	Notes	Hole	Depth	Depth (core	Top mnz (c
285	1	EHD1		1	M,T	G. Mark	Earnest H	N.Oliver	Diorite (M	Earnest H	Ernest He	Northwest or south of Depos			Unaltered		1660 ma Ti	Sybella Granite Age				
286	2	EHD5		1	M,T	G. Mark	Earnest H	N.Oliver	Diorite (M	Earnest H	Ernest He	Northwest or south of Depos			Unaltered		1660 ma Ti	Sybella Granite Age				
287	3	EHD6		1	M,T	G. Mark	Earnest H	N.Oliver	Diorite (M	Earnest H	Ernest He	Northwest or south of Depos			Unaltered		1660 ma Ti	Sybella Granite Age				
288	4	EHD2		1	M,T	G. Mark	Earnest H	N.Oliver	Diorite (M	Earnest H	Ernest He	Northwest or south of Depos			Altered	Albitised	1660 ma Ti	Sybella Granite Age				
289	5	EHD3		1	M,T	G. Mark	Earnest H	N.Oliver	Diorite (M	Earnest H	Ernest He	Northwest or south of Depos			Altered	Albitised	1660 ma Ti	Sybella Granite Age				
290	6	EHD4		1	M,T	G. Mark	Earnest H	N.Oliver	Diorite (M	Earnest H	Ernest He	Northwest or south of Depos			Altered	Albitised	1660 ma Ti	Sybella Granite Age				
291	7	EHD7		1	M,T	G. Mark	Earnest H	N.Oliver	Diorite (M	Earnest H	Ernest He	Northwest or south of Depos			Altered	Albitised	1660 ma Ti	Sybella Granite Age				
292	8	EHD8		1	M,T	G. Mark	Earnest H	N.Oliver	Diorite (M	Earnest H	Ernest He	Northwest or south of Depos			Altered	Albitised	1660 ma Ti	Sybella Granite Age				
293	9	D254B		1	M,T	N. Oliver	N.Oliver -	N.Oliver	Scapolatised Meta		Mary Kat	East (1-2km) of Mary Kathlee			Altered	Scapolitise	1750 - 173	Syn DE (D1 in MKFB) - Pre D1		Isan		
294	10	D254A		1	M,T	N. Oliver	N.Oliver -	N.Oliver	Scapolatised Meta		Mary Kat	East (1-2km) of Mary Kathlee			Altered	Scapolitise	1750 - 173	Syn DE (D1 in MKFB) - Pre D1		Isan		
295	11	D252		1	M,T	N. Oliver	N.Oliver -	N.Oliver	Scapolatised Meta		Mary Kat	East (1-2km) of Mary Kathlee			Altered	Scapolitise	1750 - 173	Syn DE (D1 in MKFB) - Pre D1		Isan		

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
296	12	D251		1	M,T	N. Oliver	N.Oliver	N.Oliver	Scapolatised Meta		Mary Kat	East (1-2km) of Mary Kathle			Altered	Scapolitise	1750 - 173	Syn DE (D1 in MKFB) - Pre D1 Isan				
297	13	D247		1	M,T	N. Oliver	N.Oliver	N.Oliver	Scapolatised Meta		Mary Kat	East (1-2km) of Mary Kathle			Altered	Scapolitise	1750 - 173	Syn DE (D1 in MKFB) - Pre D1 Isan				
298	14	D246		1	M,T	N. Oliver	N.Oliver	N.Oliver	Scapolatised Meta		Mary Kat	East (1-2km) of Mary Kathle			Altered	Scapolitise	1750 - 173	Syn DE (D1 in MKFB) - Pre D1 Isan				
299	15	D245		1	M,T	N. Oliver	N.Oliver	N.Oliver	Scapolatised Meta		Mary Kat	East (1-2km) of Mary Kathle			Altered	Scapolitise	1750 - 173	Syn DE (D1 in MKFB) - Pre D1 Isan				
300	16	D233		1	M,T	N. Oliver	N.Oliver	N.Oliver	Scapolatised Meta		Mary Kat	East (1-2km) of Mary Kathle			Altered	Scapolitise	1750 - 173	Syn DE (D1 in MKFB) - Pre D1 Isan				
301	17	D234A		1	M,T	N. Oliver	N.Oliver	N.Oliver	Scapolatised Meta		Mary Kat	East (1-2km) of Mary Kathle			Altered	Scapolitise	1750 - 173	Syn DE (D1 in MKFB) - Pre D1 Isan				
302	18	D233		1	M,T	N. Oliver	N.Oliver	N.Oliver	Scapolatised Meta		Mary Kat	East (1-2km) of Mary Kathle			Altered	Scapolitise	1750 - 173	Syn DE (D1 in MKFB) - Pre D1 Isan				
303	19	D234A		1	M,T	N. Oliver	N.Oliver	N.Oliver	Scapolatised Meta		Mary Kat	East (1-2km) of Mary Kathle			Altered	Scapolitise	1750 - 173	Syn DE (D1 in MKFB) - Pre D1 Isan				
304	20	D234B		1	M,T	N. Oliver	N.Oliver	N.Oliver	Scapolatised Meta		Mary Kat	East (1-2km) of Mary Kathle			Altered	Scapolitise	1750 - 173	Syn DE (D1 in MKFB) - Pre D1 Isan				
305	21	D235A		1	M,T	N. Oliver	N.Oliver	N.Oliver	Scapolatised Meta		Mary Kat	East (1-2km) of Mary Kathle			Altered	Scapolitise	1750 - 173	Syn DE (D1 in MKFB) - Pre D1 Isan				
306	22	D235B		1	M,T	N. Oliver	N.Oliver	N.Oliver	Scapolatised Meta		Mary Kat	East (1-2km) of Mary Kathle			Altered	Scapolitise	1750 - 173	Syn DE (D1 in MKFB) - Pre D1 Isan				
307	23	D236		1	M,T	N. Oliver	N.Oliver	N.Oliver	Scapolatised Meta		Mary Kat	East (1-2km) of Mary Kathle			Altered	Scapolitise	1750 - 173	Syn DE (D1 in MKFB) - Pre D1 Isan				
308	24	S284.5		1	M,T	Rubenac	Rubenac	M. Ruber	Gabbro		Snake Creek				Unaltered		Pre-D1	Pre-D1 Isan				
309	25	S493		1	M,T	Rubenac	Rubenac	M. Ruber	Gabbro		Snake Creek				Unaltered		Pre-D1	Pre-D1 Isan				
310	26	S572.4		1	M,T	Rubenac	Rubenac	M. Ruber	Gabbro		Snake Creek				Unaltered		Pre-D1	Pre-D1 Isan				
311	27	S585		1	M,T	Rubenac	Rubenac	M. Ruber	Gabbro		Snake Creek				Unaltered		Pre-D1	Pre-D1 Isan				
312	28	S256		1	M,T	Rubenac	Rubenac	M. Ruber	Dolerites		Snake Creek				Unaltered		~1550 Ma	syn-D2 Isan				
313	29	S701		1	M,T	Rubenac	Rubenac	M. Ruber	Dolerites		Snake Creek				Unaltered		~1550 Ma	syn-D2 Isan				
314	30	S707		1	M,T	Rubenac	Rubenac	M. Ruber	Dolerites		Snake Creek				Unaltered		~1550 Ma	syn-D2 Isan				
315	31	S587		1	M,T	Rubenac	Rubenac	M. Ruber	Gabbro		Snake Creek				Unaltered		Late	Assoiciated with Saxby Granite				
316	32	S588		1	M,T	Rubenac	Rubenac	M. Ruber	Gabbro		Snake Creek				Unaltered		Late	Assoiciated with Saxby Granite				
317	33	S492		1	M,T	Rubenac	Rubenac	M. Ruber	Diorite		Snake Creek				Unaltered		Pre_D1	Pre-D1 Isan				
318	34	S728		1	M,T	Rubenac	Rubenac	M. Ruber	Diorite		Snake Creek				Unaltered		Pre_D1	Pre-D1 Isan				
319	35	ADS2		1	M,T	Rubenac	Rubenac	M. Ruber	Diorite		Snake Creek				Unaltered		Pre_D1	Pre-D1 Isan				
320	36	S491		1	M,T	Rubenac	Rubenac	M. Ruber	Gabbro		Snake Creek				Unaltered		Pre-D1	Pre-D1 Isan				
321	37	H21.1	67441	1	M,T	Hingst	JCU Hon	M. Ruber	Gabbro		Cloncurry Fault						Late	titan, cpx, trem-act, scap				
322	38	H98	67459	1	M,T	Hingst	JCU Hon	M. Ruber	Gabbro		Cloncurry Fault						Late	Cpx, plag, ep, cl amph, Hb, musc, opx, pyrite, chalco, cc				
323	39	H99	67459	1	M,T	Hingst	JCU Hon	M. Ruber	Gabbro		Cloncurry Fault						Late	Cpx, plag, ep, cl amph, Hb, musc				
324	40	H101	67460	1	M,T	Hingst	JCU Hon	M. Ruber	Gabbro		Cloncurry Fault						Late	Cpx, plag, ep, cl amph, Hb, musc				
325	41	H167	67477	1	M,T	Hingst	JCU Hon	M. Ruber	Gabbro		Cloncurry Fault						Late	Cpx, plag, ep, cl amph, Hb, musc				
326	42	AL17.4		1	M,T	Williams	Williams	P. Willian	Skarn Alt	Meta-anc	Black Rock Prospect				Altered	Skarn						
327	43	AL17.5		1	M,T	Williams	Williams	P. Willian	Skarn Alt	Meta-anc	Black Rock Prospect				Altered	Skarn						
328	44	AL17.6		1	M,T	Williams	Williams	P. Willian	Skarn Alt	Meta-anc	Black Rock Prospect				Altered	Skarn						
329	45	CM29.2A(i)		1	M,T	Williams	Williams	P. Willian	Skarn Alt	High-Fe (	Gidya Tank				Altered	Skarn						
330	46	CM29.2A(ii)		1	M,T	Williams	Williams	P. Willian	Skarn Alt	High-Fe (	Gidya Tank				Altered	Skarn						
331	47	CJ12.2B		1	M,T	Williams	Williams	P. Willian	Skarn Alt	Meta-ign	Fairmile				Altered	Skarn						
332	48	CJ12.2D		1	M,T	Williams	Williams	P. Willian	Skarn Alt	Meta-ign	Fairmile				Altered	Skarn						
333	49	AS8.6		1	M,T	Williams	Williams	P. Willian	Skarn Alt	Meta-ign	Dingo Prospect				Altered	Skarn						
334	50	CJ11.2		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Fairmile				?Weak		1670-1620	Maronan Supergroup				
335	51	CJ11.3(i)		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Fairmile				?Weak		1670-1620	Maronan Supergroup				
336	52	CJ11.5		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Fairmile				?Weak		1670-1620	Maronan Supergroup				
337	53	CJ11.6		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Fairmile				?Weak		1670-1620	Maronan Supergroup				
338	54	CJ12.1B		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Fairmile				?Weak		1670-1620	Maronan Supergroup				
339	55	CJ12.1C		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Fairmile				?Weak		1670-1620	Maronan Supergroup				
340	56	CJ12.4		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Fairmile				?Weak		1670-1620	Maronan Supergroup				
341	57	CJ12.5		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Fairmile				?Weak		1670-1620	Maronan Supergroup				
342	58	AL10.9		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	338.00	168.50	190.50
343	59	AL10.10		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	343.50	173.50	190.50
344	60	AL10.11		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	354.50	182.00	190.50
345	61	AL10.12		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	356.50	183.50	190.50
346	62	AL10.13		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	358.50	184.50	190.50
347	63	AL10.18		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	386.50	205.50	190.50
348	64	AL10.19		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	389.00	207.50	190.50
349	65	AL13.1		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	73.50	32.50	137.00
350	66	AL13.14		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	152.00	72.50	137.00
351	67	AL13.17		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	168.50	87.00	137.00
352	68	AL13.21		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	186.50	95.00	137.00
353	69	AL13.34		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	237.50	131.00	137.00
354	70	AL13.35		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	243.75	136.00	137.00

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
355	71	AL13.37		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	252.50	140.50	137.00
356	72	AL13.45		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	268.80	151.00	137.00
357	73	AL14.1		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	22.75	18.50	155.00
358	74	AL14.2		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	25.50	20.50	155.00
359	75	AL14.6		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	41.25	33.00	155.00
360	76	AL14.8		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	46.75	37.00	155.00
361	77	AL14.13		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	57.00	45.00	155.00
362	78	AL14.36		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	161.50	134.00	155.00
363	79	AL14.38		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	167.25	140.00	155.00
364	80	AL18.18		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-22	168.00		
365	81	AL18.21		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-27	121.25	114.50	123.00
366	82	AL18.22		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-27	124.25	118.00	123.00
367	83	AL18.29		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-27	163.00	152.00	123.00
368	84	AL18.30		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-8	58.00	47.50	163.50
369	85	AL18.33		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-8	76.50	67.00	163.50
370	86	AL18.34		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-8	85.00	75.00	163.50
371	87	AL18.42		1	M,T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-8	120.00	106.50	163.50
372	88	AL10.9		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	338.00	168.50	190.50
373	89	AL10.10		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	343.50	173.50	190.50
374	90	AL10.11		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	354.50	182.00	190.50
375	91	AL10.12		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	356.50	183.50	190.50
376	92	AL10.13		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	358.50	184.50	190.50
377	93	AL10.18		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	386.50	205.50	190.50
378	94	AL10.19		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	389.00	207.50	190.50
379	95	AL13.1		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	73.50	32.50	137.00
380	96	AL13.14		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	152.00	72.50	137.00
381	97	AL13.17		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	168.50	87.00	137.00
382	98	AL13.21		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	186.50	95.00	137.00
383	99	AL13.34		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	237.50	131.00	137.00
384	100	AL13.35		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	243.75	136.00	137.00
385	101	AL13.37		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	252.50	140.50	137.00
386	102	AL13.45		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	268.80	151.00	137.00
387	103	AL14.1		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	22.75	18.50	155.00
388	104	AL14.2		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	25.50	20.50	155.00
389	105	AL14.6		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	41.25	33.00	155.00
390	106	AL14.8		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	46.75	37.00	155.00
391	107	AL14.13		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	57.00	45.00	155.00
392	108	AL14.36		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	161.50	134.00	155.00
393	109	AL14.38		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	167.25	140.00	155.00
394	110	AL18.18		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-22	168.00		
395	111	AL18.21		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-27	121.25	114.50	123.00
396	112	AL18.22		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-27	124.25	118.00	123.00
397	113	AL18.29		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-27	163.00	152.00	123.00
398	114	AL18.30		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-8	58.00	47.50	163.50
399	115	AL18.33		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-8	76.50	67.00	163.50
400	116	AL18.34		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-8	85.00	75.00	163.50
401	117	AL18.42		2	REE	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-8	120.00	106.50	163.50
402	118	AL10.9		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	338.00	168.50	190.50
403	119	AL10.10		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	343.50	173.50	190.50
404	120	AL10.11		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	354.50	182.00	190.50
405	121	AL10.12		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	356.50	183.50	190.50
406	122	AL10.13		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	358.50	184.50	190.50
407	123	AL10.18		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	386.50	205.50	190.50
408	124	AL10.19		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-37	389.00	207.50	190.50
409	125	AL13.1		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	73.50	32.50	137.00
410	126	AL13.14		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	152.00	72.50	137.00
411	127	AL13.17		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	168.50	87.00	137.00
412	128	AL13.21		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	186.50	95.00	137.00
413	129	AL13.34		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	237.50	131.00	137.00

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
414	130	AL13.35		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	243.75	136.00	137.00
415	131	AL13.37		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	252.50	140.50	137.00
416	132	AL13.45		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-36	268.80	151.00	137.00
417	133	AL14.1		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	22.75	18.50	155.00
418	134	AL14.2		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	25.50	20.50	155.00
419	135	AL14.6		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	41.25	33.00	155.00
420	136	AL14.8		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	46.75	37.00	155.00
421	137	AL14.13		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	57.00	45.00	155.00
422	138	AL14.36		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	161.50	134.00	155.00
423	139	AL14.38		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-23	167.25	140.00	155.00
424	140	AL18.18		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-22	168.00		
425	141	AL18.21		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-27	121.25	114.50	123.00
426	142	AL18.22		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-27	124.25	118.00	123.00
427	143	AL18.29		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-27	163.00	152.00	123.00
428	144	AL18.30		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-8	58.00	47.50	163.50
429	145	AL18.33		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-8	76.50	67.00	163.50
430	146	AL18.34		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-8	85.00	75.00	163.50
431	147	AL18.42		3	T	Williams	Williams	P. Willian	Amphibol	High-Fe I	Maramur	Drill Core			?Weak		1670-1620	Maronan S	74-8	120.00	106.50	163.50
432	148	FQ9647TC	60292	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD068	424.15		
433	149	FQ9648TC	60293	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD068	430.50		
434	150	FQ9649TC	60294	1	M, T	M. Smith	JCU Hon	P.William	Biotite Ar	Biotite Ar	Canningt	Core Amphibolite Body			Altered	Biotite	Pre-D1		CAD068	438.85		
435	151	FQ9650TC	60295	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD068	441.40		
436	152	FQ9651TC	60296	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD068	446.55		
437	153	FQ9652TC	60297	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD068	478.85		
438	154	FQ9653TC	60298	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD068	487.85		
439	155	FQ9654TC*	60299	1	M, T	M. Smith	JCU Hon	P.William	Garnet A	Garnet A	Canningt	Core Amphibolite Body			Altered	Garnet	Pre-D1		CAD068	513.00		
440	156	FQ9655TC	60300	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD068	513.80		
441	157	FQ9656TC	60301	1	M, T	M. Smith	JCU Hon	P.William	Fine Grai	Fine Grai	Canningt	Core Amphibolite Body					Pre-D1		CAD068	518.75		
442	158	FQ9657TC	60302	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD032	477.75		
443	159	FQ9658TC	60303	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD032	490.60		
444	160	FQ9659TC	60304	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD032	502.75		
445	161	FQ9660TC	60305	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD032	514.20		
446	162	FQ9661TC	60306	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD032	524.45		
447	163	FQ9662TC	60307	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD032	527.35		
448	164	FQ9663TC	60308	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD056	373.85		
449	165	FQ9664TC*	60309	1	M, T	M. Smith	JCU Hon	P.William	Altered A	Altered A	Canningt	Core Amphibolite Body			Altered		Pre-D1		CAD056	379.15		
450	166	FQ9665TC	60310	1	M, T	M. Smith	JCU Hon	P.William	Fine Grai	Fine Grai	Canningt	Core Amphibolite Body					Pre-D1		CAD056	392.25		
451	167	FQ9666CS	60311	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD056	403.45		
452	168	GF9004TC	60315	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD359			
453	169	GF9005TC	60316	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD359			
454	170	GF9006TC	60317	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD359			
455	171	GF9007TC	60318	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD359			
456	172	GF9008TC	60319	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD359			
457	173	GF9009TC	60320	1	M, T	M. Smith	JCU Hon	P.William	Biotite Ar	Biotite Ar	Canningt	Core Amphibolite Body			Altered	Biotite	Pre-D1		CAD359			
458	174	GF9010TC	60321	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD359			
459	175	GF9012TC	60323	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD359			
460	176	GF9013TC	60324	1	M, T	M. Smith	JCU Hon	P.William	Garnet A	Garnet A	Canningt	Core Amphibolite Body			Altered	Garnet	Pre-D1		CAD359			
461	177	GF9014TC	60325	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD359			
462	178	GF9017TC	60328	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD354			
463	179	GF9018TC	60329	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD354			
464	180	GF9019TC	60330	1	M, T	M. Smith	JCU Hon	P.William	Altered A	Altered A	Canningt	Core Amphibolite Body			Altered		Pre-D1		CAD354			
465	181	GF9491TC	60334	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD384			
466	182	GF9492TC	60335	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD384			
467	183	GF9493TC	60336	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD384			
468	184	GF9494TC	60337	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD384			
469	185	GF9495TC	60338	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD384			
470	186	GF9496TC	60339	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD384			
471	187	GF9497TC	60340	1	M, T	M. Smith	JCU Hon	P.William	Amphibol	Amphibol	Canningt	Core Amphibolite Body					Pre-D1		CAD384			
472	188	GF9498TC	60341	1	M, T	M. Smith	JCU Hon	P.William	Garnet A	Garnet A	Canningt	Core Amphibolite Body			Altered	Garnet	Pre-D1		CAD384			

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
473	189	GF9499TC	60342	1	M, T	M. Smith	JCU Hon	P.William	Fine Grai	Fine Grai	Canningt	Core Amphibolite Body					Pre-D1		CAD384			
474	190	46637	46637	1	M, T	N.Adshea	JCU PhD	P.William	Amphibol	Meta-thol	Osborne	Drill Core			?Altered				TTHQ055	257.70		
475	191	46584	46584	1	M, T	N.Adshea	JCU PhD	P.William	Amphibol	Meta-thol	Osborne	Drill Core			?Altered				TTHQ032	182.00		
476	192	46483	46483	1	M, T	N.Adshea	JCU PhD	P.William	Amphibol	Meta-thol	Osborne	Drill Core			?Altered				TTNQ199	220.00		
477	193	46541	46541	1	M, T	N.Adshea	JCU PhD	P.William	Amphibol	Meta-thol	Osborne	Drill Core			?Altered				TTHQ035	148.30		
478	194	46495	46495	1	M, T	N.Adshea	JCU PhD	P.William	Amphibol	Meta-thol	Osborne	Drill Core			?Altered				TTNQ304	615.40		
479	195	46474	46474	1	M, T	N.Adshea	JCU PhD	P.William	Amphibol	Meta-thol	Osborne	Drill Core			?Altered				TTNQ081	368.00		
480	196	46556	46556	1	M, T	N.Adshea	JCU PhD	P.William	Amphibol	Meta-thol	Osborne	Drill Core			?Altered				TTHQ031	171.10		
481	197	46647	46647	1	M, T	N.Adshea	JCU PhD	P.William	Amphibol	Meta-thol	Osborne	Drill Core			?Altered				TTNQ125	209.80		
482	198	46841	46841	1	M, T	N.Adshea	JCU PhD	P.William	Amphibol	Meta-thol	Osborne	Drill Core			?Altered				TTNQ197	206.70		
483	199	BL18.2A		1	M, T	P.William	P.William	P.William	Amphibolite		Pegmont				Altered							
484	200	BL18.3A		1	M, T	P.William	P.William	P.William	Amphibolite		Pegmont				Altered							
485	201	BL30.1A		1	M, T	P.William	P.William	P.William	Diorite	(Hypersth	Pegmont				Altered							
486	202	BL30.1B		1	M, T	P.William	P.William	P.William	Diorite	(Hypersth	Pegmont				Altered							
487	203	731-07	42673	1	M, T	R.Thoma	JCU Hon	P.William	Felsic Porphyry		Little Eva		25825	11600	Altered							
488	204	731-08	42674	1	M, T	R.Thoma	JCU Hon	P.William	Felsic Porphyry		Little Eva		25900	11600	Altered							
489	205	731-09	42657	1	M, T	R.Thoma	JCU Hon	P.William	Albite-ma	Tholeiitic	Little Eva	Drill Core			Altered				LE001	70.00		
490	206	731-10	42676	1	M, T	R.Thoma	JCU Hon	P.William	Albite-ma	Tholeiitic	Little Eva		25825	11600	Altered							
491	207	731-11	42677	1	M, T	R.Thoma	JCU Hon	P.William	Albite-ma	Tholeiitic	Little Eva		25950	11560	Altered							
492	208	731-04	42663	1	M, T	R.Thoma	JCU Hon	P.William	Biotite-Scapolite S		Little Eva	Drill Core			Altered				LE003	155.00		
493	209	731-06	42668	1	M, T	R.Thoma	JCU Hon	P.William	Biotite-Scapolite S		Little Eva	Drill Core			Altered				LE004	108.00		
494	210	731-01	42666	1	M, T	R.Thoma	JCU Hon	P.William	Scapolite	Tholeiitic	Little Eva	Drill Core			Altered				LE006	61.00		
495	211	731-02	42666a	1	M, T	R.Thoma	JCU Hon	P.William	Scapolite	Tholeiitic	Little Eva	Drill Core			Altered				LE006	61.00		
496	212	731-03	42662	1	M, T	R.Thoma	JCU Hon	P.William	Albite alt	Tholeiitic	Little Eva	Drill Core			Altered	Albite			LE002	81.85		
497	213	731-05	42667	1	M, T	R.Thoma	JCU Hon	P.William	Kspar-He	Tholeiitic	Little Eva	Drill Core			Altered				LE006	99.60		
498	214	731-04	42663	2	T, (REE)	R.Thoma	JCU Hon	P.William	Biotite-Scapolite S		Little Eva	Drill Core			Altered				LE003	155.00		
499	215	731-06	42668	2	T, (REE)	R.Thoma	JCU Hon	P.William	Biotite-Scapolite S		Little Eva	Drill Core			Altered				LE004	108.00		
500	216	731-01	42666	2	T, (REE)	R.Thoma	JCU Hon	P.William	Scapolite	Tholeiitic	Little Eva	Drill Core			Altered				LE006	61.00		
501	217	731-02	42666a	2	T, (REE)	R.Thoma	JCU Hon	P.William	Scapolite	Tholeiitic	Little Eva	Drill Core			Altered				LE006	61.00		
502	218	731-03	42662	2	T, (REE)	R.Thoma	JCU Hon	P.William	Albite alt	Tholeiitic	Little Eva	Drill Core			Altered	Albite			LE002	81.85		
503	219	731-05	42667	2	T, (REE)	R.Thoma	JCU Hon	P.William	Kspar-He	Tholeiitic	Little Eva	Drill Core			Altered				LE006	99.60		
504	220	8508	48543	1	M, T	S.Wang	Provision	P.William	Altered Amphibolite		Mount Ell	Drill Core			Altered		1670-1620	Maronan S	MEQ94-85	139.60		
505	221	2108	48469	1	M, T	S.Wang	Provision	P.William	Altered Amphibolite		Mount Ell	Drill Core			Altered		1670-1620	Maronan S	MEQ90-21	257.85		
506	222	2109	48470	1	M, T	S.Wang	Provision	P.William	Altered Amphibolite		Mount Ell	Drill Core			Altered		1670-1620	Maronan S	MEQ90-21	264.95		
507	223	2110	48471	1	M, T	S.Wang	Provision	P.William	Altered Amphibolite		Mount Ell	Drill Core			Altered		1670-1620	Maronan S	MEQ90-21	266.30		
508	224	8509	48544	1	M, T	S.Wang	Provision	P.William	Altered Amphibolite		Mount Ell	Drill Core			Altered		1670-1620	Maronan S	MEQ94-85	142.80		
509	225	S5-14	27388	1	M, T	S.Wang	Provision	P.William	Altered Amphibolite		Mount Ell	Drill Core			Altered		1670-1620	Maronan S	CRQ79-S5	334.85		
510	226	S4-02	48885	1	M, T	S.Wang	Provision	P.William	Altered Amphibolite		Mount Ell	Drill Core			Altered		1670-1620	Maronan S	CRQ79-S4	182.70		
511	227	U2-15B	27469B	1	M, T	S.Wang	Provision	P.William	Altered Amphibolite		Mount Ell	Drill Core			Altered		1670-1620	Maronan S	UMED2	219.95		
512	228	S4-N2	48886	1	M, T	S.Wang	Provision	P.William	Altered Amphibolite		Mount Ell	Drill Core			Altered		1670-1620	Maronan S	CRQ79-S4	189.15		
513	229	E89	48554	1	M, T	S.Wang	Provision	P.William	Amphibolite		Mount Ell	Drill Core			Unaltered		1670-1620	Maronan S	MEQ94-89	98.60		
514	230	E90	48556	1	M, T	S.Wang	Provision	P.William	Amphibolite		Mount Ell	Drill Core			Unaltered		1670-1620	Maronan S	MEQ94-90	89.20		
515	231	E91	48558	1	M, T	S.Wang	Provision	P.William	Amphibolite		Mount Ell	Drill Core			Unaltered		1670-1620	Maronan S	MEQ94-91	92.00		
516	232	E98	48569	1	M, T	S.Wang	Provision	P.William	Amphibolite		Mount Ell	Drill Core			Unaltered		1670-1620	Maronan S	MEQ94-98	43.90		
517	233	8502	48537	1	M, T	S.Wang	Provision	P.William	Amphibolite		Mount Ell	Drill Core			Unaltered		1670-1620	Maronan S	MEQ94-85	92.10		
518	234	E12	48457	1	M, T	S.Wang	Provision	P.William	Metabasalt		Mount Ell	Drill Core			?		1670-1620	Maronan S	MEQ89-13	343.30		
519	235	E43	48515	1	M, T	S.Wang	Provision	P.William	Metabasalt		Mount Ell	Drill Core			?		1670-1620	Maronan S	MEQ91-43	318.40		
520	236	11001	48574	1	M, T	S.Wang	Provision	P.William	Metabasalt		Mount Ell	Drill Core			?		1670-1620	Maronan S	MEQ94-11	165.30		
521	237	11002	48575	1	M, T	S.Wang	Provision	P.William	Metabasalt		Mount Ell	Drill Core			?		1670-1620	Maronan S	MEQ94-11	172.20		
522	238	3103	48504	1	M, T	S.Wang	Provision	P.William	Fine Grained Mass		Mount Ell	Drill Core			Altered	Skarn	1670-1620	Maronan S	MEQ91-31	139.61		
523	239	3104	48505	1	M, T	S.Wang	Provision	P.William	Fine Grained Mass		Mount Ell	Drill Core			Altered	Skarn	1670-1620	Maronan S	MEQ91-31	140.50		
524	240	3105	48506	1	M, T	S.Wang	Provision	P.William	Fine Grained Mass		Mount Ell	Drill Core			Altered	Skarn	1670-1620	Maronan S	MEQ91-31	141.11		
525	241	3106	48507	1	M, T	S.Wang	Provision	P.William	Fine Grained Mass		Mount Ell	Drill Core			Altered	Skarn	1670-1620	Maronan S	MEQ91-31	145.47		
526	242	3107	48508	1	M, T	S.Wang	Provision	P.William	Fine Grained Mass		Mount Ell	Drill Core			Altered	Skarn	1670-1620	Maronan S	MEQ91-31	148.26		
527	243	3108	48509	1	M, T	S.Wang	Provision	P.William	Fine Grained Mass		Mount Ell	Drill Core			Altered	Skarn	1670-1620	Maronan S	MEQ91-31	151.70		
528	244	3109	48510	1	M, T	S.Wang	Provision	P.William	Fine Grained Mass		Mount Ell	Drill Core			Altered	Skarn	1670-1620	Maronan S	MEQ91-31	152.10		
529	245	3110	48511	1	M, T	S.Wang	Provision	P.William	Fine Grained Mass		Mount Ell	Drill Core			Altered	Skarn	1670-1620	Maronan S	MEQ91-31	153.10		
530	246	3111	48512	1	M, T	S.Wang	Provision	P.William	Massive Skarn		Mount Ell	Drill Core			Altered	Skarn	1670-1620	Maronan S	MEQ91-31	154.57		
531	247	2108	48469	1	M, T	S.Wang	Provision	P.William	Altered Amphibolite		Mount Ell	Drill Core			Altered		1670-1620	Maronan S	MEQ90-21	257.85		

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
532	248	2109	48470	1	M, T	S.Wang	Provision	P.William	Altered Amphibolit		Mount Ell	Drill Core			Altered		1670-1620	Maronan S	MEQ90-21	264.95		
533	249	2110	48471	1	M, T	S.Wang	Provision	P.William	Altered Amphibolit		Mount Ell	Drill Core			Altered		1670-1620	Maronan S	MEQ90-21	266.30		
534	250	7902	48534	1	M, T	S.Wang	Provision	P.William	Metabasalt		Mount Ell	Drill Core			?		1670-1620	Maronan S	MEQ94-79	85.80		
535	251	S4-N1	48884	1	M, T	S.Wang	Provision	P.William	Fine Grained Mass		Mount Ell	Drill Core			Altered	Skarn	1670-1620	Maronan S	CRQ79-S4	181.75		
536	252	3101	48502	1	M, T	S.Wang	Provision	P.William	Fine Grained Mass		Mount Ell	Drill Core			Altered	Skarn	1670-1620	Maronan S	MEQ91-31	137.33		
537	253	48334	48334	1	M, T	Baker	JCU PhD	Baker/PJ	Amphibolite		Eloise								69	225.00		
538	254	48291	48291	1	M, T	Baker	JCU PhD	Baker/PJ	Amphibolite		Eloise								80	485.90		
539	255	48313A	48313A	1	M, T	Baker	JCU PhD	Baker/PJ	Replacive Ab V in		Eloise								6	86.00		
540	256	48127	48127	1	M, T	Baker	JCU PhD	Baker/PJ	Chl V in Amphibolit		Eloise								39	518.00		
541	257	R.S.3	62841	1	M, T	SYNA	JCU Hon	SYNA 20	Amphibolite		Osborne	Underground Drill Drive			Altered		Pre-D2 at l	Oikycrystic	925 ISS / 795 ISS			
542	258	OSB 19 (A)	62834	1	M, T	SYNA	JCU Hon	SYNA 20	Amphibolite		Osborne				Unaltered		Pre-D2 at l	Unaltered I	OSB 19	461.01		
543	259	R.S.7	62856	1	M, T	SYNA	JCU Hon	SYNA 20	Amphibolite		Osborne	Underground Drill Drive			Altered		Pre-D2 at l	Contact b/	925 ISS / 795 ISS			
544	260	HONQ 29 (E	62839	1	M, T	SYNA	JCU Hon	SYNA 20	Amphibolite		Houdini	Prospect			Altered		Pre-D2 at l	Highly strai	HONQ 29	185.37		
545	261	OSB 19 (B)	62835	1	M, T	SYNA	JCU Hon	SYNA 20	Amphibolite		Osborne				Unaltered		Pre-D2 at l	Unaltered I	OSB 19	464.03		
546	262	R.S.3	62841	2	REE	SYNA	JCU Hon	SYNA 20	Amphibolite		Osborne	Underground Drill Drive			Altered		Pre-D2 at l	Oikycrystic	925 ISS / 795 ISS			
547	263	OSB 19 (A)	62834	2	REE	SYNA	JCU Hon	SYNA 20	Amphibolite		Osborne				Unaltered		Pre-D2 at l	Unaltered I	OSB 19	461.01		
548	264	R.S.7	62856	2	REE	SYNA	JCU Hon	SYNA 20	Amphibolite		Osborne	Underground Drill Drive			Altered		Pre-D2 at l	Contact b/	925 ISS / 795 ISS			
549	265	HONQ 29 (E	62839	2	REE	SYNA	JCU Hon	SYNA 20	Amphibolite		Houdini	Prospect			Altered		Pre-D2 at l	Highly strai	HONQ 29	185.37		
550	266	OSB 19 (B)	62835	2	REE	SYNA	JCU Hon	SYNA 20	Amphibolite		Osborne				Unaltered		Pre-D2 at l	Unaltered I	OSB 19	464.03		
551	267	1.1		1	M,T,REE	G. de Jor	G.de Jon	P. Willian	Amphibolite		Fullarton	River Suite 1			Unaltered		Pre-D2 at latest					
552	268	1.2		1	M,T,REE	G. de Jor	G.de Jon	P. Willian	Amphibolite		Fullarton	River Suite 1			Altered		Pre-D2 at latest					
553	269	1.3		1	M,T,REE	G. de Jor	G.de Jon	P. Willian	Amphibolite		Fullarton	River Suite 1			Altered		Pre-D2 at latest					
554	270	2.1		1	M,T,REE	G. de Jor	G.de Jon	P. Willian	Amphibolite		Fullarton	River Suite 2			Unaltered		Pre-D2 at latest					
555	271	2.2		1	M,T,REE	G. de Jor	G.de Jon	P. Willian	Amphibolite		Fullarton	River Suite 2			Altered		Pre-D2 at latest					
556	272	3.1		1	M,T,REE	G. de Jor	G.de Jon	P. Willian	Amphibolite		Maramungee Creek				Unaltered		Pre-D2 at latest					
557	273	3.2		1	M,T,REE	G. de Jor	G.de Jon	P. Willian	Amphibolite		Maramungee Creek				Un/Alt		Pre-D2 at latest					
558	274	3.3		1	M,T,REE	G. de Jor	G.de Jon	P. Willian	Amphibolite		Maramungee Creek				Un/Alt		Pre-D2 at latest					
559	275	3.4		1	M,T,REE	G. de Jor	G.de Jon	P. Willian	Amphibolite		Maramungee Creek				Alt/Un		Pre-D2 at latest					
560	276	3.5		1	M,T,REE	G. de Jor	G.de Jon	P. Willian	Amphibolite		Maramungee Creek				Altered		Pre-D2 at latest					
561	277	E89		1	M, T	Wang & \	Wang & \	P. Willian	Amphibolite		Mount Elliot				Unaltered		Pre-D2 at latest		MEQ94-85	98.60		
562	278	8509		1	M, T	Wang & \	Wang & \	P. Willian	Amphibolite Altere		Mount Elliot				Altered		Pre-D2 at l	albite-diops	MEQ94-85	128.00		
563	279	9B		1	M,T	M. Kenne	Kennedy	Rubenac	Amphibolite		Osborne	Pit			Altered	bi-chl	pre or Syn-	pre-D2 tectonically emplaced				
564	280	10		1	M,T	M. Kenne	Kennedy	Rubenac	Amphibolite		Osborne	Drill Core			Altered	bi-py	pre or Syn-	pre-D2 tectonically emplaced				
565	281	74205475(1)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Prospect	877658			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Corella Formation				
566	282	74205476(2)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Prospect	874637			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Corella Formation				
567	283	74205514(3)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Quamby	997561			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Corella Formation				
568	284	74205520(4)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Prospect	890640			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Argylla Formation				
569	285	74205531(5)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Prospect	917456			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Argylla Formation				
570	286	74205532(6)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Prospect	915457			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Argylla Formation				
571	287	74205536(7)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Prospect	906426			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Argylla Formation				
572	288	74205522(8)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Prospect	933448			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Wonga Granite				
573	289	742055239(9)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Prospect	937449			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Wonga Granite				
574	290	74205524(10)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Prospect	925453			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Wonga Granite				
575	291	74205527(11)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Prospect	939448			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Wonga Granite				
576	292	74205567(12)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Prospect	913507			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Wonga Granite				
577	293	74205658(13)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Malbon S	246721			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Cone Creek Member Basalt				
578	294	74205666(14)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Malbon S	257729			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Cone Creek Member Basalt				
579	295	74205666(15)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Malbon S	464467			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Kuridala Formation				
580	296	74205670(16)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Malbon S	470462			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Kuridala Formation				
581	297	74205671(17)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Malbon S	478472			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Kuridala Formation				
582	298	74205672(18)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Malbon S	471480			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Kuridala Formation				
583	299	74205675(19)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Mt Angel	509455			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Kuridala Formation				
584	300	74205683(20)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Mt Angel	510430			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Kuridala Formation				
585	301	74205657(21)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Cloncurry	640870			relatively	Unaltered	Pre 1550 M	E2 Dolerite Dykes - intrudes Llewellyn Creek Formation				
586	302	74205684(22)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Cloncurry	663007			relatively	Metasomat	Pre 1550 M	E1 Dolerite Intrusion - intrudes Toole Creek Volcanics				
587	303	74205652(23)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Lunch Cr	Cloncurry	548922			relatively	Unaltered	1740 Ma	E3 Dolerite Intrusion - intrudes Corella Formation				
588	304	74205650(24)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Cloncurry	482078			relatively	Unaltered	1740 Ma	E3 Dolerite Intrusion - intrudes Corella Formation				
589	305	74205615(25)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Marraba	027047			relatively	Unaltered	1740 Ma	E3 Dolerite Intrusion - intrudes Corella Formation				
590	306	74200097(26)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Prospector Sheet				relatively	Unaltered	Late	E4 Dolerite				

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
591	307	74205525(27)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Prospect	938448			relatively	Unaltered	Late	E4 Dolerite - intrudes Wonga Granite				
592	308	73205369(28)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Marraba	997967			relatively	Unaltered	Late	E4 Dolerite - intrudes Corella Formation				
593	309	74205622(29)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Marraba	035047			relatively	Unaltered	Late	E4 Dolerite - intrudes Corella Formation				
594	310	74205673(30)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Mt Angel	502453			relatively	Unaltered	Late	E4 Dolerite - intrudes Kuridala Formation				
595	311	74205674(31)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Mt Angel	508548			relatively	Unaltered	Late	E4 Dolerite - intrudes Kuridala Formation				
596	312	74205676(32)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Mt Angel	532402			relatively	Unaltered	Late	E4 Dolerite - intrudes Williams Batholith				
597	313	74205678(33)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Mt Angel	540462			relatively	Unaltered	Late	E4 Dolerite - intrudes Doherty Formation				
598	314	74205693(34)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Selwyn	894117			relatively	Unaltered	Late	E4 Dolerite - intrudes Doherty Formation				
599	315	74205699(35)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Selwyn	894117			relatively	Unaltered	Late	E4 Dolerite - intrudes Doherty Formation				
600	316	74205701(36)		1	M,T	Ellis & W	Ellis & W	AGSO	Dolerite	Dolerite	Selwyn	858089			relatively	Unaltered	Late	E4 Dolerite - intrudes Doherty Formation				
601	317	74205539(9 - M)		1	M,T	Ellis & W	Ellis & W	AGSO	Scapolite	Scapolite	Prospect	910420			Altered	Scapolite	Pre 1550 M	E2 Dolerite Dykes				
602	318	74205651 (10 - M)		1	M,T	Ellis & W	Ellis & W	AGSO	Scapolite	Scapolite	Cloncurry	545060?			Altered	Scapolite	Pre 1550 M	E2 Dolerite Dykes				
603	319	MFC015 1	59198	1	M,T	Matt Brov	Matt Brov	M. Browr	Gabbro	Tea Tree Creek Layered Complex					Unaltered		Probably Late		MFC015	114.30		
604	320	MFC015 8	59204	1	M,T	Matt Brov	Matt Brov	M. Browr	Gabbro	Tea Tree Creek Layered Complex					Unaltered		Probably Late		MFC015	158.70		
605	321	TT001 10	59102	1	M,T	Matt Brov	Matt Brov	M. Browr	Olivine G	Tea Tree Creek Layered Complex					Unaltered		Probably Late		TT001	502.00		
606	322	121	44643	1	M,T	G. de Jor	G. de Jor	G. de Jor	Metadole	Amphibol	Maramur	Maramungee Creek East					Pre-D2 at latest					
607	323	9	44592	1	M,T	G. de Jor	G. de Jor	G. de Jor	Metadole	Metadole	Maramungee Creek				Altered	Scapolite	Pre-D2 at latest					
608	324	10	44593	1	M,T	G. de Jor	G. de Jor	G. de Jor	Metadole	Metadole	Maramungee Creek						Pre-D2 at latest					
609	325	14	44594	1	M,T	G. de Jor	G. de Jor	G. de Jor	Metadole	Metadole	Maramungee Creek				Altered	Sericitised	Pre-D2 at latest					
610	326	136	44650	1	M,T	G. de Jor	G. de Jor	G. de Jor	Metadole	Metadole	Maramur	Maramungee Creek East					Pre-D2 at latest					
611	327	90	44633	1	M,T	G. de Jor	G. de Jor	G. de Jor	Metadole	Metadole	Maramungee Creek				?	Ab veining	Pre-D2 at latest					
612	328	99	44635	1	M,T	G. de Jor	G. de Jor	G. de Jor	Metadole	Metadole	Maramur	Maramungee Creek West			Altered	Scapolite a	Pre-D2 at latest					
613	329	163B	44667	1	M,T	G. de Jor	G. de Jor	G. de Jor	Metadole	Metadole	Maramur	Maramungee Creek West					Pre-D2 at latest					
614	330	5	44588	1	M,T	G. de Jor	G. de Jor	G. de Jor	Metadole	Metadole	Maramungee Creek						Pre-D2 at latest					
615	331	78	44625	1	M,T	G. de Jor	G. de Jor	G. de Jor	Metadole	Metabasa	Maramungee Creek				Alt?		Pre-D2 at latest					
616	332	172	44675	1	M,T	G. de Jor	G. de Jor	G. de Jor	Metadole	Altered M	Maramungee Creek				Altered	Scapolite a	Pre-D2 at latest					
617	333	172B	44676	1	M,T	G. de Jor	G. de Jor	G. de Jor	Metadole	Metadole	Maramungee Creek						Pre-D2 at latest					
618	334	172C	44677	1	M,T	G. de Jor	G. de Jor	G. de Jor	Metadole	Metadole	Maramungee Creek						Pre-D2 at latest					
619	335	172D	44678	1	M,T	G. de Jor	G. de Jor	G. de Jor	Metadole	Metadole	Maramungee Creek						Pre-D2 at latest					
620	336	172E	44679	1	M,T	G. de Jor	G. de Jor	G. de Jor	Metadole	Metadole	Maramungee Creek				Altered	Scapolite a	Pre-D2 at latest					
621																						
622																						
623																						
624																						
625																						
626																						
627																						
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SHRIMP Upb Data for Snake Creek Tonalite (Rubenach)

Table *xyz* . Summary of SHRIMP U-Pb zircon results for sample S536.

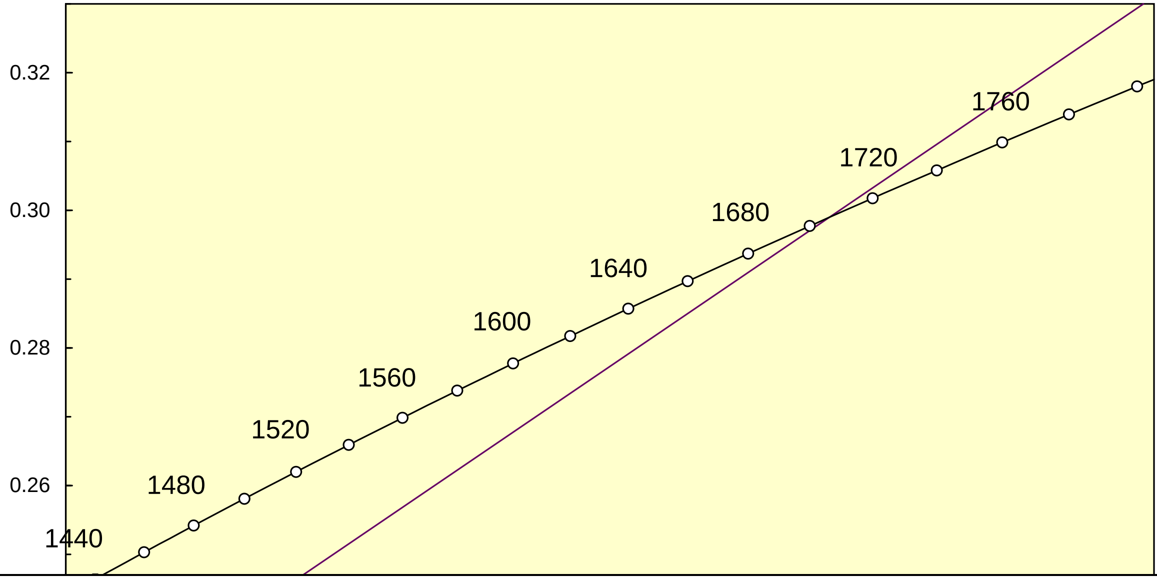
Grain. spot	U (ppm)	Th (ppm)	Th/U	$^{206}Pb^*$ (ppm)	$^{204}Pb/^{206}Pb$	f_{206} %	Radiogenic Ratios $^{206}Pb/^{238}U$	±	$^{207}Pb/^{235}U$	±	$^{207}Pb/^{206}Pb$	±	ρ	Age (Ma) $^{206}Pb/^{238}U$	±	$^{207}Pb/^{206}Pb$	±	% Disc
1.1	209	122	0.58	53	0.000075	0.12	0.2948	0.0034	4.201	0.055	0.1034	0.0007	0.876	1665	17	1686	12	1
2.1	246	146	0.59	60	0.000094	0.15	0.2842	0.0032	4.001	0.051	0.1021	0.0006	0.869	1613	16	1662	12	3
3.1	275	165	0.60	70	0.000044	0.07	0.2946	0.0033	4.179	0.051	0.1029	0.0005	0.902	1664	16	1677	10	1
4.1	505	377	0.75	127	0.000044	0.07	0.2936	0.0031	4.175	0.047	0.1031	0.0004	0.937	1659	16	1681	7	1
5.1	281	177	0.63	71	0.000096	0.15	0.2933	0.0033	4.173	0.052	0.1032	0.0006	0.885	1658	16	1682	11	1
6.1	605	409	0.68	141	0.000086	0.14	0.2705	0.0028	3.809	0.043	0.1021	0.0004	0.925	1543	14	1663	8	7
7.1	240	151	0.63	51	0.000630	1.00	0.2427	0.0027	3.369	0.065	0.1007	0.0016	0.587	1401	14	1637	29	14
8.1	116	38	0.33	27	0.000092	0.14	0.2671	0.0033	3.813	0.060	0.1035	0.0010	0.785	1526	17	1688	18	10
9.1	385	244	0.63	97	0.000019	0.03	0.2944	0.0032	4.169	0.049	0.1027	0.0005	0.911	1663	16	1674	9	1
10.1	299	134	0.45	72	0.000229	0.36	0.2797	0.0031	3.916	0.053	0.1015	0.0008	0.814	1590	15	1652	15	4
11.1	427	305	0.71	107	0.000056	0.09	0.2905	0.0031	4.125	0.051	0.1030	0.0006	0.875	1644	16	1679	11	2
12.1	193	94	0.49	45	0.000217	0.34	0.2722	0.0031	3.809	0.056	0.1015	0.0009	0.787	1552	16	1651	17	6
13.1	166	85	0.51	42	-	<0.01	0.2910	0.0035	4.180	0.066	0.1042	0.0011	0.762	1646	18	1700	19	3
14.1	770	132	0.17	163	0.000137	0.22	0.2459	0.0026	3.341	0.038	0.0985	0.0005	0.912	1417	13	1597	9	11
15.1	333	181	0.54	80	0.000007	0.01	0.2808	0.0030	3.988	0.047	0.1030	0.0005	0.926	1595	15	1679	8	5
16.1	311	186	0.60	79	0.000043	0.07	0.2958	0.0032	4.186	0.050	0.1027	0.0005	0.916	1670	16	1673	9	0
17.1	415	291	0.70	105	0.000055	0.09	0.2958	0.0032	4.206	0.050	0.1031	0.0005	0.913	1670	16	1681	9	1
18.1	182	92	0.51	47	0.000082	0.13	0.3018	0.0035	4.309	0.056	0.1036	0.0006	0.890	1700	19	1689	11	-1
19.1	132	44	0.33	29	0.000502	0.79	0.2562	0.0031	3.618	0.070	0.1024	0.0015	0.627	1470	16	1669	28	12
20.1	322	197	0.61	82	0.000039	0.06	0.2973	0.0032	4.210	0.050	0.1027	0.0005	0.919	1678	16	1674	9	0

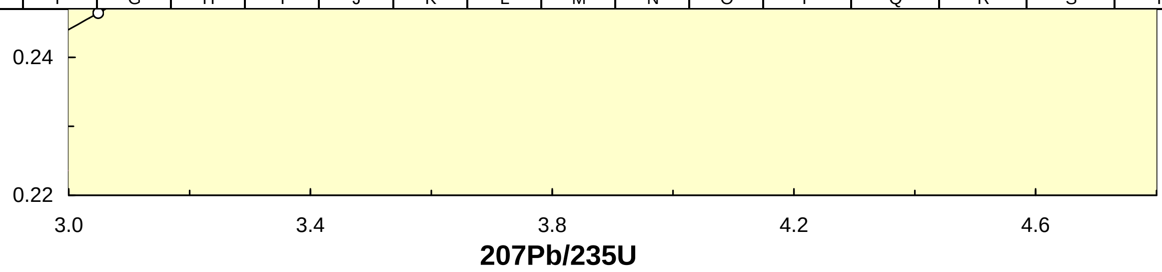
Notes :

1. Uncertainties given at the one σ level.
2. f_{206} % denotes the percentage of ^{206}Pb that is common Pb.

3. Correction for common Pb made using the measured $^{204}Pb/^{206}Pb$ ratio.

4. For % Disc., 0% denotes a concordant analysis.





Geoscience Australia Ozchem Database - Mafic Rocks Mount Isa Eastern Succession

Row	FEATURE	UFI	SITEID	SITENO	SAMPLEID	ANALYTI	COM_ST	SIO2	TIO2	AL2O3	FE2O3T(	FE2O3	FEO	MNO	MGO	CAO	NA2O	K2O	P2O5	H2OPLUS	H2OMIN	CO2
788	RCHEM	66	94532128	87472	94532128	whole-roc	M	69.58	0.63	14.69	4.91	2.03	2.59	0.06	1.6	0.77	1.9	3.01	0.09	0	0	0
789	RCHEM	75	94531948	87447	94531948	whole-roc	M	64.29	0.49	14.75	5.69	3.49	1.98	0.04	2.06	1.15	0.58	4.45	0.07	0	0	0
790	RCHEM	100	94531732	87418	94531732	whole-roc	M	64.28	0.48	13.7	6.19	5.47	0.65	0.02	1.58	1.53	1.36	2.91	0.05	0	0	0
791	RCHEM	165	94531840	87433	94531840	whole-roc	M	50.13	1.48	13	15.79	9.5	5.66	0.17	4.71	2.06	3.38	0.23	0.11	0	0	0
792	RCHEM	199	94531654	87407	94531654	whole-roc	M	75.36	0.67	10.28	7.36	6.42	0.85	0.05	0.6	0.61	1.27	1.18	0.04	0	0	0
793	RCHEM	225	79205320A	73532	79205320A	whole-roc	M	70.56	0.41	13.35	3.46	1.94	1.37	0.01	1.29	1.67	3.69	4.01	0.1	0	0	0
794	RCHEM	589	DH105	7257	DH105	whole-roc	M	61.7	0.55	11.32	0	2.08	1.48	0.06	2.69	8.02	6.78	0.06	0.15	0	0	0
795	RCHEM	667	78530447	2921	78530447	whole-roc	M	74.2	0.2	13.1	0	0.77	0.75	0.01	0.31	0.98	3.34	5.25	0.08	0.29	0.23	0.1
796	RCHEM	1074	94532026	88473	94532026	whole-roc	M	68.6	0.59	13.69	6.66	5.28	1.24	0.05	1.01	0.88	0.24	3.96	0.24	0	0	0
797	RCHEM	1101	94532123	88475	94532123	whole-roc	M	75.01	0.44	12.59	3.25	1.54	1.54	0.07	1.08	1.29	2.39	2.02	0.08	0	0	0
798	RCHEM	1128	94531792	87426	94531792	whole-roc	M	64.77	0.61	17.73	4.11	2.99	1.01	0.01	1.24	0.32	1.38	5.41	0.11	0	0	0
799	RCHEM	1158	94531630	87403	94531630	whole-roc	M	57.88	0.45	12.67	6.01	3.35	2.39	0.09	3.12	5.14	0.35	3.61	0.11	0	0	0
800	RCHEM	1183	94531960	87449	94531960	whole-roc	M	49.65	2.1	12.51	14.08	2.96	10.01	0.15	5.81	5.35	1.94	0.11	0.25	0	0	0
801	RCHEM	1238	94531930	88471	94531930	whole-roc	M	67.29	0.58	16.42	3.92	3.48	0.4	0.01	1.32	0.25	0.34	5.08	0.09	0	0	0
802	RCHEM	1266	94532181	87480	94532181	whole-roc	M	73.56	0.49	12.35	5.13	2.37	2.48	0.04	1.33	0.76	1.73	2.22	0.08	0	0	0
803	RCHEM	1653	93206922	51318	93206922	whole-roc	M	75.9	0.03	14	0.72	0.53	0.17	0	0.04	0.51	6.95	0.74	0.18	0	0	0
804	RCHEM	2411	88206015	18860	88206015	whole-roc	M	63.41	0.28	17.67	1.96	1.82	0.13	0.01	0.43	0.12	1.79	13.07	0.08	0	0	0
805	RCHEM	2413	88206017	42217	88206017	whole-roc	M	70.56	0.28	14.89	1.48	1.3	0.16	0.01	0.41	0.16	3.67	7.34	0.08	0	0	0
806	RCHEM	2419	88206020	18862	88206020	whole-roc	M	72.82	0.34	13.77	2.1	1.32	0.7	0.03	0.45	1.05	6.38	2.35	0.08	0	0	0
807	RCHEM	3238	86206088	7088	86206088	whole-roc	M	66.04	0.61	14.96	0	2.7	2.19	0.03	0.9	2.16	4.16	4.6	0.15	0	0	0
808	RCHEM	3255	86206063	7069	86206063	whole-roc	M	79.6	0.66	8.96	0	1.76	0.15	-0.01	-0.01	0.17	0.07	7.65	0.13	0	0	0
809	RCHEM	3316	86206069	7074	86206069	whole-roc	M	72.06	0.19	13.75	0	1.3	1.08	0.01	0.27	1.65	3.55	4.45	0.04	0	0	0
810	RCHEM	3370	86206014	7027	86206014	whole-roc	M	49.59	1.53	13.81	0	1.69	10.78	0.2	6.56	12.14	1.55	0.18	0.12	0	0	0
811	RCHEM	3382	86206012	7025	86206012	whole-roc	M	72.38	0.27	8.25	0	2.58	0.3	0.11	0.7	4.92	4.69	0.13	0.1	0	0	0
812	RCHEM	3390	86206050	7059	86206050	whole-roc	M	72.82	0.2	13.62	0	1.05	0.67	0.01	0.38	1.16	3.42	5.47	0.04	0	0	0
813	RCHEM	3402	86206118	7114	86206118	whole-roc	M	67.02	0.5	14.36	0	2.41	2.24	0.04	1.49	2.81	3.47	3.3	0.13	0	0	0
814	RCHEM	3823	84536106	3219	84536106	whole-roc	M	69.81	0.42	14.6	0	0.96	2.23	0.03	0.67	1.59	3.63	4.67	0.23	0.47	0.14	0.06
815	RCHEM	3885	78531371	39126	78531371	whole-roc	M	67.3	0.58	14.7	0	1.94	2.05	0.04	0.86	2.62	3.93	4.52	0.15	0.82	0.21	0.05
816	RCHEM	3895	78530012	3254	78530012	whole-roc	M	48.2	0.81	13.9	0	1.39	8.73	0.18	9.53	13.5	1.58	0.23	0.05	1.46	0.15	0.16
817	RCHEM	3903	78531714	41765	78531714	whole-roc	M	71.3	0.33	13.4	0	1.67	1.23	0.02	0.67	1.28	3.26	4.78	0.09	0.74	0.22	0.48
818	RCHEM	3939	78534374	2934	78534374	whole-roc	M	69.4	0.34	15.1	0	0.06	1.6	0.01	0.94	2.44	6.9	0.86	0.11	0.81	0.14	1.05
819	RCHEM	3945	84536115	3226	84536115	whole-roc	M	72.98	0.27	13.58	0	1.54	0.58	0.01	0.72	1.66	5.37	0.84	0.08	0.69	0.39	0.56
820	RCHEM	3961	69200025	3099	69200025	whole-roc	M	63.7	0.46	12.65	0	0.47	0	-0.01	0.53	0.39	3.51	4.1	0.13	6.89	0	-0.05
821	RCHEM	3982	78531669	39141	78531669	whole-roc	M	72.7	0.21	13.6	0	1.84	0.84	0.04	0.44	1.05	7.06	0.83	0.18	0.53	0.12	0.1
822	RCHEM	3990	78530494	2922	78530494	whole-roc	M	78.3	0.17	10.2	0	0.82	0.53	0.02	0.19	1.44	5.66	0.28	0.04	0.07	0.14	1.25
823	RCHEM	4000	78530626	39140	78530626	whole-roc	M	71.2	0.44	13.6	0	0.45	2.37	0.02	0.76	1.83	3.34	4.5	0.13	0.69	0.14	0.3
824	RCHEM	4129	94531606	87399	94531606	whole-roc	M	66.73	1.37	12.76	5.86	2.48	3.04	0.11	1.04	1.71	0.21	0.95	0.07	0	0	0
825	RCHEM	4153	94532038	87460	94532038	whole-roc	M	58.19	0.83	19.85	7.96	3.69	3.84	0.08	2.08	0.4	0.31	5.04	0.19	0	0	0

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
826	RCHEM	4186	94532020	87458	94532020	whole-roc	M	66.09	0.7	16.08	6.17	3.8	2.13	0.02	1.32	0.37	1.16	3.91	0.22	0	0	0
827	RCHEM	4206	94531636	87405	94531636	whole-roc	M	75.64	0.58	11.58	3.21	1.71	1.35	0.03	0.97	0.72	1.71	2.49	0.03	0	0	0
828	RCHEM	4285	93206915	51313	93206915	whole-roc	M	72.53	0.22	13.59	2.32	2.12	0.18	0.02	0.36	0.84	3.68	5.1	0.06	0	0	0
829	RCHEM	4577	88206018	18861	88206018	whole-roc	M	72.55	0.28	13.68	1.02	0.65	0.33	0.01	0.4	1.44	5.98	3.11	0.07	0	0	0
830	RCHEM	4619	78534365	2356	78534365	whole-roc	M	49.3	1.43	13.9	0	0.34	11.2	0.24	6.5	11.2	2.66	0.73	0.15	1.41	0.31	-0.05
831	RCHEM	4711	78531187	2926	78531187	whole-roc	M	70.6	0.32	14.1	0	1.38	1.31	0.04	0.89	2.17	5.42	2.54	0.09	0.68	0.21	0.25
832	RCHEM	5181	94531828	87432	94531828	whole-roc	M	49.34	1.22	13.32	14.22	6.75	6.72	0.15	5.71	5.78	0.96	1.02	0.1	0	0	0
833	RCHEM	5211	94532098	87469	94532098	whole-roc	M	65.96	0.63	15.91	7.17	2.65	4.07	0.05	1.64	0.28	1.11	3.84	0.13	0	0	0
834	RCHEM	5212	94532068	87464	94532068	whole-roc	M	76.91	0.42	9.8	4.98	3.04	1.75	0.03	1.28	0.44	1.56	1.92	0.09	0	0	0
835	RCHEM	5213	94531648	88465	94531648	whole-roc	M	78.1	0.4	10.58	2.54	1.4	1.03	0.01	0.85	0.75	2.19	0.87	0.02	0	0	0
836	RCHEM	5283	94531989	87453	94531989	whole-roc	M	78.38	0.42	9.78	2.65	2.06	0.53	0	0.69	0.66	1.57	3.36	0.11	0	0	0
837	RCHEM	5302	94532146	87475	94532146	whole-roc	M	64.3	0.63	15.52	6.73	2.31	3.98	0.06	2.33	1.23	1.29	3.78	0.14	0	0	0
838	RCHEM	5337	94532050	87462	94532050	whole-roc	M	73.34	0.39	10.75	5.29	1.71	3.22	0.16	1.69	2.43	1.23	1.9	0.1	0	0	0
839	RCHEM	5338	94531936	87445	94531936	whole-roc	M	76.59	0.25	10.88	2.3	1.28	0.92	0.03	0.69	1.41	4.77	0.7	0.04	0	0	0
840	RCHEM	5798	92208004	42746	92208004	whole-roc	M	66.28	0.74	12.36	7.24	1.55	5.12	0.23	0.44	2.82	0.78	8.11	0.21	0	0	0
841	RCHEM	5958	92208013	30793	92208013	whole-roc	M	77.94	0.3	11.6	0.89	0.16	0.66	0	0.31	0.38	3.54	4.28	0.05	0	0	0
842	RCHEM	5959	92208026	30798	92208026	whole-roc	M	66.35	0.71	15.11	2.11	2.11	0	0.03	0.07	0.07	0.38	11.7	0.07	0	0	0
843	RCHEM	7149	86206138	7130	86206138	whole-roc	M	70.63	0.41	14.48	0	0.97	2.68	0.11	1.1	1.21	2.27	3.73	0.12	0	0	0
844	RCHEM	7180	86206129	7123	86206129	whole-roc	M	70.52	0.41	13.86	0	1.14	0.98	0.01	0.65	2.3	4.64	3.34	0.12	0	0	0
845	RCHEM	7204	86206128	7122	86206128	whole-roc	M	74.19	0.36	13.97	0	0.34	0.26	-0.01	0.11	1.32	5.92	2.05	0.02	0	0	0
846	RCHEM	7236	86206087	7087	86206087	whole-roc	M	51.39	1.32	14.4	0	3.48	7.54	0.13	5.38	6.73	3.82	2.12	0.54	0	0	0
847	RCHEM	7348	86206057	7064	86206057	whole-roc	M	63.76	0.5	14.11	0	0.98	2.71	0.11	2.86	8.17	5.13	0.68	0.14	0	0	0
848	RCHEM	7352	85206008	47378	85206008	whole-roc	M	68.94	0.59	14.13	0	2.41	1.48	0.01	0.87	1.99	3.91	4.2	0.12	0	0	0
849	RCHEM	7366	86206002	7017	86206002	whole-roc	M	47.46	1.01	16.35	0	2.64	8.3	0.17	6.4	11.26	2.67	0.41	0.08	0	0	0
850	RCHEM	7367	86206016	7028	86206016	whole-roc	M	78.33	0.33	9.84	0	0.88	1.16	0.03	0.26	0.84	2.34	4.6	0.38	0	0	0
851	RCHEM	7389	86206119	7115	86206119	whole-roc	M	71.92	0.13	15.31	0	0.51	0.49	-0.01	0.23	1.56	6	2.24	0.04	0	0	0
852	RCHEM	7429	86206059	7066	86206059	whole-roc	M	72.37	0.17	13.63	0	1.19	0.64	0.01	0.31	1.33	3.4	5.63	0.05	0	0	0
853	RCHEM	7696	69200052	3313	69200052	whole-roc	M	48.56	2.94	12.32	0	6.51	10.6	0.22	4.95	7.95	3.36	0.68	0.16	0.55	0	0.55
854	RCHEM	7701	69200278	3104	69200278	whole-roc	M	58.24	0.61	20.25	0	7.3	0	0.06	1.89	0.18	1.13	4.8	0.16	4.72	0	-0.05
855	RCHEM	7746	84536107	39193	84536107	whole-roc	M	73.51	0.22	13.37	0	1.22	0.55	0.01	0.34	1.04	4.16	4.35	0.07	0.36	0.24	0.12
856	RCHEM	7750	69200028	39218	69200028	whole-roc	M	48.16	1.38	13.76	0	2.67	11.7	0.23	6.77	11.58	1.99	0.26	0.14	0.46	0	-0.05
857	RCHEM	7764	69200043E	3319	69200043B	whole-roc	M	49.2	1.92	17.78	0	3.4	10.9	0.3	3.88	9.13	3.59	0.47	0.1	0.35	0	0.05
858	RCHEM	7783	78530065F	3255	78530065F	whole-roc	M	49.2	2.23	12.1	0	6.01	9.02	0.15	4.96	8.78	3.89	0.81	0.19	1.52	0.22	0.05
859	RCHEM	7835	69200098	41812	69200098	whole-roc	M	49.3	2.1	14.17	0	4.48	11.6	0.15	6.14	8.94	2.08	1.26	0.1	0.97	0	-0.05
860	RCHEM	7879	78531105	2573	78531105	whole-roc	M	67.8	0.67	12.1	0	1.65	4.08	0.26	0.53	2.82	0.77	7.72	0.17	0.43	0.19	0.13
861	RCHEM	7933	78530361	39139	78530361	whole-roc	M	68	0.4	15.1	0	1.3	1.66	0.04	0.85	2.11	4.93	4.26	0.16	0.58	0.2	0.15
862	RCHEM	8011	94532032	87459	94532032	whole-roc	M	71.93	0.57	13.45	4.75	3.34	1.27	0.04	1.26	0.49	0.99	3.43	0.13	0	0	0
863	RCHEM	8123	94532074	87465	94532074	whole-roc	M	67.12	0.64	14.97	6.62	3.62	2.7	0.07	1.69	0.53	1.06	3.7	0.15	0	0	0
864	RCHEM	8124	94531925	87444	94531925	whole-roc	M	68.9	0.55	15.39	3.68	3.19	0.44	0.02	1.61	0.38	1.59	4.27	0.05	0	0	0
865	RCHEM	8147	94531678	87410	94531678	whole-roc	M	48.78	1.27	13.55	18.02	16.61	1.27	0.15	2.17	2.14	1.75	1.06	0.09	0	0	0
866	RCHEM	8224	94531821	87431	94531821	whole-roc	M	69.74	0.52	15.75	2.8	2.42	0.34	0.04	0.8	0.42	2.71	4.07	0.04	0	0	0
867	RCHEM	8256	93206918	51316	93206918	whole-roc	M	76.06	0.14	12.87	0.48	0.28	0.18	0.01	0.1	0.17	3.29	5.71	0.01	0	0	0
868	RCHEM	8510	GC5	39398	GC5	whole-roc	M	49.84	1.73	13.1	0	3.68	11.99	0.17	5.11	8.33	2.78	0.55	0.17	0	0	0
869	RCHEM	8519	78534405	2839	78534405	whole-roc	M	59.3	1.01	14.7	0	4.62	3.9	0.1	2.3	4.74	4.26	2.67	0.39	1.1	0.28	0.25
870	RCHEM	8942	94532008	87456	94532008	whole-roc	M	67.67	0.73	14.7	6.38	4.17	1.99	0.02	1.37	0.44	1.11	3.94	0.2	0	0	0
871	RCHEM	9002	94531642	87406	94531642	whole-roc	M	55.2	1.48	12.18	12.78	3.48	8.37	0.19	4.45	6.38	1.91	0.75	0.08	0	0	0
872	RCHEM	9056	94532044	87461	94532044	whole-roc	M	70.41	0.6	12.66	5.68	3.75	1.74	0.11	1.54	0.94	1.98	2.38	0.12	0	0	0
873	RCHEM	9057	94531980	87451	94531980	whole-roc	M	62.12	0.68	18.77	5.68	2.62	2.75	0.03	1.63	0.69	1.07	5.25	0.13	0	0	0
874	RCHEM	9058	94531798	87427	94531798	whole-roc	M	75.36	0.42	11.69	3.84	3.34	0.45	0.02	0.52	0.33	3.01	2.48	0.03	0	0	0
875	RCHEM	9082	94531864	87436	94531864	whole-roc	M	72.65	0.76	12.66	4.46	3.46	0.9	0.05	0.75	0.44	1.37	3.61	0.07	0	0	0
876	RCHEM	9083	94531744	88467	94531744	whole-roc	M	49.24	1	12.87	13.58	12.1	1.33	0.1	3.53	3.73	2.84	0.74	0.08	0	0	0
877	RCHEM	9115	94532151	88476	94532151	whole-roc	M	68.38	0.58	13.6	5.99	1.5	4.04	0.04	2.3	1.13	1.52	3.2	0.13	0	0	0
878	RCHEM	9405	93206913	51311	93206913	whole-roc	M	70.24	0.3	13.41	4.02	2.65	1.23	0.02	0.56	2.54	6.28	0.65	0.15	0	0	0
879	RCHEM	9633	92208027	30799	92208027	whole-roc	M	45.73	0.17	4.6	38.75	38.75	0	1.79	0.07	0.53	0.29	2.48	0.79	0	0	0
880	RCHEM	11080	86206132	7126	86206132	whole-roc	M	72.69	0.4	13.42	0	0.95	0.54	-0.01	0.69	2.06	6.98	0.51	0.12	0	0	0
881	RCHEM	11095	86206123	7118	86206123	whole-roc	M	71.27	0.15	15.57	0	1.15	0.66	-0.01	0.34	1.83	7.07	0.56	0.06	0	0	0
882	RCHEM	11129	86206070	7075	86206070	whole-roc	M	71.76	0.3	13.73	0	1.54	1.15	0.02	0.43	1.7	3.59	4.81	0.1	0	0	0
883	RCHEM	11162	86206022	39343	86206022	whole-roc	M	71.79	0.32	13.59	0	1.49	1.39	0.02	0.57	1.44	3.47	4.63	0.11	0	0	0
884	RCHEM	11189	86206067	7072	86206067	whole-roc	M	65.3	0.31	15.88	0	1.75	1.12	0.03	0.78	2.54	5.63	5.11	0.16	0	0	0

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
885	RCHEM	11215	86206011	7024	86206011	whole-roc	M	46.79	1.64	11.66	0	1.89	12.13	0.19	4.93	7.37	2.04	0.33	0.14	0	0	0
886	RCHEM	11233	86206110	41884	86206110	whole-roc	M	50.3	1.62	12.66	0	4.59	10.69	0.64	5.38	8.15	3.28	0.7	0.15	0	0	0
887	RCHEM	11265	86206005	7019	86206005	whole-roc	M	97.45	0.02	0.79	0	0.01	0.11	-0.01	-0.01	-0.01	0.16	0.1	0.01	0	0	0
888	RCHEM	11281	86206082	7085	86206082	whole-roc	M	69.36	0.43	14.26	0	1.89	1.12	0.01	0.66	1.68	4.92	3.85	0.11	0	0	0
889	RCHEM	11287	GC6	41902	GC6	whole-roc	M	48.24	1.66	13.2	0	5.18	9.87	0.25	6.22	9.09	2.31	0.5	0.15	0	0	0
890	RCHEM	11681	84536113	3224	84536113	whole-roc	M	70.74	0.4	13.92	0	1.93	0.73	0.05	0.86	1.93	5.77	1.82	0.11	0.71	0.24	1.14
891	RCHEM	11697	78530455	2940	78530455	whole-roc	M	72	0.35	7.5	0	1.34	4.14	0.41	1.04	9.05	0.86	0.74	0.09	0.74	0.38	0.95
892	RCHEM	11700	78534226/	2933	78534226A	whole-roc	M	74.5	0.17	13.3	0	1.02	0.47	0.03	0.24	0.85	3.67	4.49	0.06	0.52	0.15	-0.05
893	RCHEM	11711	78534266	39058	78534266	whole-roc	M	48.8	1.62	13.7	0	5.26	10	0.21	5.4	8.25	3.77	0.61	0.17	1.26	0.35	-0.05
894	RCHEM	11740	74205701	3383	74205701	whole-roc	M	49.27	3.36	13.05	0	5.06	9.5	0.19	4.21	6.47	2.65	1.87	0.34	2.56	0.16	0.1
895	RCHEM	11753	78531123	2355	78531123	whole-roc	M	46.6	4.85	15.6	0	2.72	11.6	0.2	2.82	8.6	3.6	0.92	0.49	1.13	0.39	-0.05
896	RCHEM	11792	69200030	3307	69200030	whole-roc	M	47.82	1	17.89	0	1.74	8.45	0.15	6.2	12.65	2	1	0.11	1.04	0	-0.05
897	RCHEM	11847	69200039	3318	69200039	whole-roc	M	52.1	2.06	13.45	0	2.15	12.2	0.21	5.29	7	4.09	0.23	0.13	0.17	0	0.05
898	RCHEM	11894	78534226	47377	78534226	whole-roc	M	75.7	0.14	12.4	0	0.68	0.9	0.03	0.19	0.79	3.64	4.59	0.04	0.45	0.22	0.05
899	RCHEM	12002	94531846	87434	94531846	whole-roc	M	72.34	0.63	12.99	4.08	2.7	1.24	0.06	0.89	0.86	5.33	0.82	0.04	0	0	0
900	RCHEM	12079	94531714	87415	94531714	whole-roc	M	45.72	0.77	12.91	11.27	2.44	7.95	0.14	7.15	14.02	1.57	0.35	0.04	0	0	0
901	RCHEM	12080	94531768	87423	94531768	whole-roc	M	48.26	1.27	14.13	14.12	4.27	8.86	0.19	5.9	7.88	1.53	0.83	0.09	0	0	0
902	RCHEM	12280	94532055	88474	94532055	whole-roc	M	61.47	0.66	18.03	7.89	2.53	4.82	0.24	2.26	0.39	0.66	4.52	0.13	0	0	0
903	RCHEM	12281	94532002	87455	94532002	whole-roc	M	62.39	1.01	20.15	3.39	2.7	0.62	0.03	0.96	0.35	1.9	6	0.23	0	0	0
904	RCHEM	12484	86206065	7070	86206065	whole-roc	M	63.24	0.85	15.14	0	3.28	1.96	0.02	1.15	2.76	4.58	4.54	0.24	0	0	0
905	RCHEM	12497	78534205	2835	78534205	whole-roc	M	73.4	0.12	13.3	0	0.72	1.26	0.02	0.29	0.6	3.45	4.79	0.16	1.07	0.13	-0.05
906	RCHEM	12888	94532103	87470	94532103	whole-roc	M	74.96	0.45	12.82	3.25	1.21	1.84	0.06	1.14	0.42	2.44	2.6	0.08	0	0	0
907	RCHEM	12889	94532062	87463	94532062	whole-roc	M	63.12	0.6	16.76	6.89	3.4	3.14	0.07	2.32	0.78	0.86	4.07	0.14	0	0	0
908	RCHEM	12890	94531774	88468	94531774	whole-roc	M	69.6	0.54	12.41	5.77	4.99	0.7	0.06	1.2	1.13	3.18	1.72	0.04	0	0	0
909	RCHEM	12908	94532163	87477	94532163	whole-roc	M	66.44	0.77	15.97	6.08	2.66	3.08	0.04	1.86	0.32	1.45	3.69	0.1	0	0	0
910	RCHEM	12909	94532187	87481	94532187	whole-roc	M	51.4	1.64	12.75	17.92	9.49	7.59	0.11	4.29	2.6	3.02	2.71	0.15	0	0	0
911	RCHEM	12942	94532200	87483	94532200	whole-roc	M	76.67	0.41	10.77	4.49	2.39	1.89	0.02	1.05	0.2	2.95	1.49	0.08	0	0	0
912	RCHEM	12986	94531762	87422	94531762	whole-roc	M	42.54	1.15	15.83	14.55	12.17	2.14	0.19	6.02	1.82	0.52	2.29	0.08	0	0	0
913	RCHEM	13044	94531816	87430	94531816	whole-roc	M	50.58	1.35	12.29	15.14	8.14	6.3	0.15	4.59	4.26	2.16	1.24	0.12	0	0	0
914	RCHEM	13045	94531631	87404	94531631	whole-roc	M	66.52	0.65	13.19	4.96	3.67	1.16	0.06	1.54	2.26	0.83	3.73	0.09	0	0	0
915	RCHEM	13139	94531894	87440	94531894	whole-roc	M	70.63	0.47	14.76	3.12	2.65	0.42	0.02	0.65	0.28	3.9	3.46	0.06	0	0	0
916	RCHEM	13140	94531672	87409	94531672	whole-roc	M	55.41	1.4	11.48	14.6	7.41	6.47	0.17	3.95	5.41	2.22	0.7	0.1	0	0	0
917	RCHEM	13166	94531971	87450	94531971	whole-roc	M	70.16	0.56	15.68	3.03	1.85	1.06	0.01	1	0.55	2.98	3.18	0.1	0	0	0
918	RCHEM	13189	94531917	87443	94531917	whole-roc	M	54.24	1.23	13.15	12.5	3.44	8.15	0.13	5.02	6.74	2.87	1.14	0.09	0	0	0
919	RCHEM	13500	93206917	51315	93206917	whole-roc	M	60.12	0.88	16.63	6.66	2.93	3.36	0.07	1.94	4.07	4.46	2.96	0.24	0	0	0
920	RCHEM	13709	92208015	30795	92208015	whole-roc	M	76.82	0.33	13.33	0.11	0.11	0	0	0.01	0.44	5.11	3.45	0.06	0	0	0
921	RCHEM	13842	92208006	30805	92208006	whole-roc	M	87.93	0.17	5.46	2.48	0.65	1.65	0.03	0.43	0.15	1.79	0.99	0.06	0	0	0
922	RCHEM	15136	86206114	7110	86206114	whole-roc	M	80.18	0.32	8.8	0	0.94	2.03	0.06	0.36	0.57	1.48	3.84	0.1	0	0	0
923	RCHEM	15180	86206122	39352	86206122	whole-roc	M	65.79	0.69	15.81	0	3.47	1.92	0.04	0.83	2.88	7.32	0.38	0.23	0	0	0
924	RCHEM	15202	86206013	7026	86206013	whole-roc	M	80.53	0.29	9.05	0	0.95	0.82	0.02	0.34	1.04	4.62	0.41	0.18	0	0	0
925	RCHEM	15210	86206010	39341	86206010	whole-roc	M	75.08	0.57	14.17	0	0.91	0.12	-0.01	0.57	0.11	0.13	4.62	0.04	0	0	0
926	RCHEM	15211	86206015	39342	86206015	whole-roc	M	48.39	0.7	14.69	0	1.84	8.01	0.16	8.66	13.98	1.53	0.18	0.03	0	0	0
927	RCHEM	15212	86206062	47566	86206062	whole-roc	M	64.92	0.88	15.46	0	3.35	1.53	0.01	1.12	2.07	7.06	1.95	0.24	0	0	0
928	RCHEM	15215	86206112	39351	86206112	whole-roc	M	60.96	1.21	17.45	0	2.23	3.04	0.37	0.25	8.16	3.3	2.41	0.24	0	0	0
929	RCHEM	15235	86206109	7107	86206109	whole-roc	M	48.21	0.81	12.55	0	2.07	9.54	0.2	9.76	13.07	1.55	0.43	0.06	0	0	0
930	RCHEM	15258	86206025	7035	86206025	whole-roc	M	54.73	1.87	12.13	0	3.25	11.18	0.29	2.38	7.67	3.75	0.48	0.37	0	0	0
931	RCHEM	15259	86206125	7120	86206125	whole-roc	M	62.64	0.82	15.82	0	2.35	2.67	0.05	1.33	3.64	4.5	3.6	0.21	0	0	0
932	RCHEM	15260	86206127	7121	86206127	whole-roc	M	73.47	0.37	13.62	0	0.63	0.7	0.01	0.55	1.95	5.52	1.95	0.09	0	0	0
933	RCHEM	15302	86206116	7112	86206116	whole-roc	M	73.86	0.12	14.05	0	0.19	0.44	-0.01	0.23	1.21	3.54	4.69	0.02	0	0	0
934	RCHEM	15309	86206117	7113	86206117	whole-roc	M	68.5	0.52	14.52	0	1.99	2.62	0.04	1.32	2.78	3.4	2.7	0.12	0	0	0
935	RCHEM	15773	84536117	3228	84536117	whole-roc	M	71.77	0.29	13.65	0	1.17	1.34	0.03	0.52	1.2	3.38	5.31	0.07	0.66	0.3	0.13
936	RCHEM	15782	78534061	41788	78534061	whole-roc	M	58.6	1.26	14.9	0	6.91	0.76	0.07	2.49	4.75	5.45	2.93	0.42	0.72	0.19	-0.05
937	RCHEM	15793	78530037E	2571	78530037B	whole-roc	M	66.3	1.11	11.2	0	3.18	4.21	0.07	0.59	11.4	0.45	0.14	0.24	0.52	0.18	0.17
938	RCHEM	15807	78530599	41781	78530599	whole-roc	M	71.5	0.39	13.2	0	1.34	1.75	0.03	0.66	1.4	3.31	4.81	0.1	0.7	0.17	0.1
939	RCHEM	15819	78530699	2925	78530699	whole-roc	M	72.6	0.33	13.2	0	1.41	1.14	0.01	0.76	1.5	3.28	4.49	0.1	0.62	0.25	0.05
940	RCHEM	15851	69200047	3321	69200047	whole-roc	M	45.47	1.93	10.03	0	6.48	13.3	0.35	8.06	10.9	1	0.67	0.18	0.53	-0.05	0
941	RCHEM	15862	78530263	2920	78530263	whole-roc	M	73.3	0.29	13.7	0	0.66	1.23	0.03	0.51	1.64	3.24	4.53	0.08	0.48	0.29	0.05
942	RCHEM	15894	78534070	2942	78534070	whole-roc	M	48.9	3.9	12.6	0	1.48	11.7	0.34	3.66	9.4	2.14	3.85	0.46	0.64	0.3	-0.05
943	RCHEM	15974	94532193	87482	94532193	whole-roc	M	77.06	0.44	11.01	4.17	1.58	2.33	0.04	1.08	0.58	1.88	1.98	0.08	0	0	0

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
944	RCHEM	16082	94531858	88470	94531858	whole-ro(	M	65.81	0.65	14.14	4.5	3.22	1.15	0.04	1.32	2.49	1.31	4.22	0.05	0	0	0
945	RCHEM	16100	94531964	88472	94531964	whole-ro(	M	50.06	1.38	9.04	12.77	7.86	4.42	0.19	2.6	9.87	1.86	0.47	0.15	0	0	0
946	RCHEM	16120	94531900	87441	94531900	whole-ro(	M	71.24	0.36	14.59	3.27	2.25	0.92	0.01	0.84	0.22	2.79	4.08	0.04	0	0	0
947	RCHEM	16564	78530516	2832	78530516	whole-ro(	M	62.6	0.74	16.2	0	4.75	3.55	0.12	1.04	4.85	3.13	1.38	0.23	1.33	0.19	-0.05
948	RCHEM	16891	94532079	87466	94532079	whole-ro(	M	60.68	0.74	19.45	6.64	2.24	3.96	0.12	1.93	0.34	0.9	5.71	0.15	0	0	0
949	RCHEM	16916	94532116	87471	94532116	whole-ro(	M	62.32	0.75	19	5.56	3.59	1.77	0.06	1.86	0.26	0.62	4.77	0.1	0	0	0
950	RCHEM	16917	94532133	87473	94532133	whole-ro(	M	69.82	0.58	14.54	4.65	2.48	1.95	0.02	1.8	0.27	1.77	3.11	0.08	0	0	0
951	RCHEM	16918	94531953	87448	94531953	whole-ro(	M	43.52	1.5	12.66	15.1	4.24	9.77	0.19	5.18	7.88	2.03	0.15	0.12	0	0	0
952	RCHEM	16962	94531780	87424	94531780	whole-ro(	M	65.79	0.4	11.98	6.07	4.13	1.75	0.06	3.1	0.75	0.98	4.7	0.08	0	0	0
953	RCHEM	16963	94531612	87400	94531612	whole-ro(	M	77.03	1.03	10.57	3.56	1.98	1.42	0.05	0.66	0.17	0.17	1.81	0.03	0	0	0
954	RCHEM	16976	94532167	87478	94532167	whole-ro(	M	88.47	0.16	4.71	2.62	1.16	1.31	0.01	0.63	0.32	1.27	0.58	0.05	0	0	0
955	RCHEM	16995	94531691	87411	94531691	whole-ro(	M	43.17	1.64	10.23	13.22	3.99	8.31	0.2	5.4	13.82	2.64	0.37	0.12	0	0	0
956	RCHEM	17438	93206923	51319	93206923	whole-ro(	M	71.63	0.35	13.5	2.55	1.51	0.94	0.01	0.75	1.56	4.36	4.1	0.08	0	0	0
957	RCHEM	17457	93206916	51314	93206916	whole-ro(	M	75.15	0.22	12.77	1.24	0.4	0.76	0	0.1	0.3	3.13	5.82	0.04	0	0	0
958	RCHEM	17538	93206914	51312	93206914	whole-ro(	M	71.85	0.36	13.31	3.19	1.49	1.53	0.04	0.65	1.48	3.43	4.5	0.1	0	0	0
959	RCHEM	17775	92208016	42747	92208016	whole-ro(	M	70.29	0.66	12.94	6.34	3.68	2.39	0.04	0.86	1.96	6.16	0.19	0.15	0	0	0
960	RCHEM	19124	86206028	7038	86206028	whole-ro(	M	48.14	1.79	12.81	0	2.95	11.65	0.17	6.19	9.81	2.66	0.12	0.14	0	0	0
961	RCHEM	19125	E2/3040	7668	E2/3040	whole-ro(	M	48.32	1.81	13	0	4.8	13.55	0.32	4.4	7.65	3.7	0.3	0.14	0	0	0
962	RCHEM	19131	86206053	39345	86206053	whole-ro(	M	68.99	0.49	14.29	0	2.15	1.48	0.03	0.82	2.33	3.98	4	0.12	0	0	0
963	RCHEM	19133	86206083	39348	86206083	whole-ro(	M	72.7	0.19	13.47	0	0.83	0.42	-0.01	0.23	0.85	4.13	5.77	0.07	0	0	0
964	RCHEM	19143	86206017	7029	86206017	whole-ro(	M	86.22	0.26	6.54	0	0.45	1.24	0.05	0.5	1.85	1.43	0.58	0.07	0	0	0
965	RCHEM	19172	86206004	7018	86206004	whole-ro(	M	97.83	0.04	0.89	0	0.06	0.14	-0.01	0.02	0.03	0.16	0.18	0.03	0	0	0
966	RCHEM	19206	E3/3046	7672	E3/3046	whole-ro(	M	63.78	0.47	18.56	0	0.53	0.1	-0.01	0.03	0.03	0.93	14.21	-0.01	0	0	0
967	RCHEM	19249	86206024	7034	86206024	whole-ro(	M	47.19	2.59	12.65	0	4	15.03	0.45	3.91	9.18	2.48	0.4	0.19	0	0	0
968	RCHEM	19250	86206085	7086	86206085	whole-ro(	M	72.1	0.24	13.69	0	1.72	0.84	0.01	0.4	0.86	5.01	3.59	0.07	0	0	0
969	RCHEM	19260	86206019	7031	86206019	whole-ro(	M	88.87	0.2	5.02	0	0.55	1.3	0.05	0.49	0.99	1.02	0.72	0.07	0	0	0
970	RCHEM	19310	86206090	7090	86206090	whole-ro(	M	76.22	0.12	11.96	0	0.74	0.41	-0.01	0.04	0.71	3.23	5.06	0.01	0	0	0
971	RCHEM	19313	86206027	7037	86206027	whole-ro(	M	49.54	1.23	13.85	0	1.91	11.15	0.2	6.52	11.17	2.55	0.21	0.09	0	0	0
972	RCHEM	19315	E2/3041	7669	E2/3041	whole-ro(	M	55.3	3	15.66	0	3.1	8.35	0.21	1.85	3.97	6.67	0.34	0.22	0	0	0
973	RCHEM	19716	79205320	2899	79205320	whole-ro(	M	70.6	0.38	13.8	0	1.62	0.04	1.05	1.66	3.66	4.5	0.1	0.5	0.15	0.15	0.18
974	RCHEM	19717	78534270E	2944	78534270B	whole-ro(	M	44.9	2.41	14.4	0	2.31	11.5	0.29	2.37	17.2	2.09	0.78	0.34	0.86	0.3	-0.05
975	RCHEM	19737	84536105	3218	84536105	whole-ro(	M	68.72	0.57	14.42	0	1.69	0.77	0.02	0.85	3.04	7.49	0.6	0.17	0.58	0.24	0.4
976	RCHEM	19740	78530072(	2353	78530072C	whole-ro(	M	50.1	1.59	12.5	0	7.55	6.65	0.12	5.2	8.8	4.9	1.12	0.18	0.88	0.23	0.05
977	RCHEM	19766	78534389	2837	78534389	whole-ro(	M	61	1.54	13.8	0	2.01	6.62	0.13	2.12	4.57	3.79	2.7	0.28	0.84	0.21	0.05
978	RCHEM	19770	69200043/	3312	69200043A	whole-ro(	M	53.73	1.09	15.7	0	2.43	7.55	0.22	3.18	6.12	5.47	0.76	0.4	0.42	0	0.05
979	RCHEM	19796	78534400	2838	78534400	whole-ro(	M	69.1	0.63	13.6	0	1.8	4.02	0.06	0.7	1.87	3.35	3.28	0.18	0.88	0.21	-0.05
980	RCHEM	19811	74205676	3379	74205676	whole-ro(	M	49.99	1.23	14.21	0	3.07	8.35	0.19	7.03	10.31	1.96	1.47	0.11	1.73	0.15	0.05
981	RCHEM	19845	78531479	2834	78531479	whole-ro(	M	51.7	1.66	14.2	0	6.25	6.15	0.15	5.3	4.95	3.43	3.56	0.69	1.39	0.26	0.25
982	RCHEM	19847	78530821	3256	78530821	whole-ro(	M	50.8	1.42	13.7	0	4.73	7.14	0.47	5.87	8.67	4.12	0.49	0.12	1.16	0.2	0.13
983	RCHEM	19848	69200035/	3317	69200035A	whole-ro(	M	49.4	2.18	13.54	0	4.81	13.2	0.41	3.98	8.69	2.09	0.38	0.2	0.57	0	-0.05
984	RCHEM	19890	84536119	3230	84536119	whole-ro(	M	70.7	0.35	13.65	0	2.49	1.29	0.03	1.19	0.61	2.12	6.03	0.08	1.27	0.3	0.61
985	RCHEM	19891	84536120	3231	84536120	whole-ro(	M	71.29	0.36	13.57	0	2.33	0.81	0.02	0.95	0.65	3.77	4.76	0.08	0.97	0.2	0.45
986	RCHEM	19900	78530541	2572	78530541	whole-ro(	M	72.3	0.13	15.5	0	0.73	0.51	0.01	0.27	1.83	5.28	2.13	0.04	0.31	0.09	0.16
987	RCHEM	19915	74205693	47381	74205693	whole-ro(	M	50.15	1.76	13.43	0	3.53	7.95	0.19	6.67	8.82	2.27	1.93	0.16	2.36	0.14	0.05
988	RCHEM	19929	78530593	2924	78530593	whole-ro(	M	73.9	0.23	13.5	0	0.38	0.61	0.02	0.35	2.05	4.03	3.95	0.09	0.44	0.14	0.25
989	RCHEM	19986	94531666	87408	94531666	whole-ro(	M	56.26	1.29	11.82	12.7	4.68	7.22	0.16	4.45	6.12	2.1	0.86	0.07	0	0	0
990	RCHEM	20043	94531756	87421	94531756	whole-ro(	M	72.61	0.38	14.07	2.62	2.2	0.38	0.02	1.1	0.62	0.52	3.52	0.02	0	0	0
991	RCHEM	20081	94532092	87468	94532092	whole-ro(	M	73.77	0.48	11.27	6.2	5.2	0.9	0.05	1.27	0.2	0.96	2.37	0.08	0	0	0
992	RCHEM	20934	94532014	87457	94532014	whole-ro(	M	47.48	2.08	12.2	17.38	7.11	9.24	0.31	3.93	6.52	4.59	1.07	0.17	0	0	0
993	RCHEM	20935	94531906	87442	94531906	whole-ro(	M	48	1.41	13.23	15.66	1.88	12.4	0.13	6.98	8.57	2.28	1.09	0.08	0	0	0
994	RCHEM	20959	94531834	88469	94531834	whole-ro(	M	68.94	0.54	13.6	5.54	4.96	0.52	0.04	1.11	0.61	1.87	3.49	0.05	0	0	0
995	RCHEM	20991	94532158	87476	94532158	whole-ro(	M	66.43	0.64	16.13	6.65	1.67	4.48	0.04	1.78	0.36	1.18	4.02	0.14	0	0	0
996	RCHEM	21031	94531996	87454	94531996	whole-ro(	M	72.79	0.48	13.26	3.47	3.06	0.37	0.08	0.81	0.65	2.36	3.14	0.14	0	0	0
997	RCHEM	21032	94531876	87437	94531876	whole-ro(	M	68.55	0.57	15.84	3.4	2.51	0.8	0.04	1.36	0.43	2.19	4.21	0.08	0	0	0
998	RCHEM	21054	94531708	87414	94531708	whole-ro(	M	48.85	1.06	13.26	12.77	2.2	9.51	0.15	6.91	11.12	2.08	0.34	0.06	0	0	0
999	RCHEM	21803	92208017	30796	92208017	whole-ro(	M	56.38	0.91	13.65	14.42	5.8	7.76	0.12	4.04	3.72	4.79	0.85	0.12	0	0	0
1000	RCHEM	22444	88206014	18859	88206014	whole-ro(	M	72.68	0.27	13.58	1.2	1	0.18	0.02	0.5	1.58	7.74	0.2	0.09	0	0	0
1001	RCHEM	23238	86206066	7071	86206066	whole-ro(	M	76.24	0.14	13.3	0	0.89	0.28	-0.01	0.02	0.34	6.35	2.17	0.01	0	0	0
1002	RCHEM	23257	86206049	7058	86206049	whole-ro(	M	74.92	0.18	12.72	0	0.81	0.6	-0.01	0.25	1.03	3.16	5.1	0.03	0	0	0

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1003	RCHEM	23259	86206130	7124	86206130	whole-roc	M		64.53	0.73	15.3	0	2.75	2.12	0.04	1.26	3.49	5.76	2.49	0.23	0	0	0
1004	RCHEM	23297	86206124	7119	86206124	whole-roc	M		67.84	0.31	17.24	0	1.03	1.01	-0.01	0.68	2.36	6.32	1.97	0.1	0	0	0
1005	RCHEM	23318	86206026	7036	86206026	whole-roc	M		48.09	0.62	14.61	0	1.84	7.81	0.16	8.85	14.31	1.37	0.17	0.04	0	0	0
1006	RCHEM	23343	86206113	7109	86206113	whole-roc	M		74.73	0.43	11.29	0	1.09	3.16	0.07	0.49	1.35	2.5	3.61	0.14	0	0	0
1007	RCHEM	23366	86206018	7030	86206018	whole-roc	M		80.15	0.3	9.18	0	0.62	1.94	0.19	0.73	5.8	0.29	0.14	0.12	0	0	0
1008	RCHEM	23367	86206115	7111	86206115	whole-roc	M		49.43	1.6	12.99	0	4.6	11.26	0.41	5.53	10.27	0.94	0.86	0.15	0	0	0
1009	RCHEM	23384	86206009	7023	86206009	whole-roc	M		20	-0.01	1.36	0	44.84	0.2	0.54	0.22	0.02	0.12	0.32	0.1	0	0	0
1010	RCHEM	23402	86206058	7065	86206058	whole-roc	M		69.8	0.38	14.17	0	2.22	1.41	0.02	0.62	1.81	4.06	4.21	0.11	0	0	0
1011	RCHEM	23403	86206061	7068	86206061	whole-roc	M		64.68	0.1	18	0	0.76	0.11	-0.01	-0.01	-0.01	0.14	16.06	-0.01	0	0	0
1012	RCHEM	23419	85206009	39305	85206009	whole-roc	M		66.61	0.72	15.2	0	3.54	1.77	0.02	1.09	3.41	4.93	1.34	0.17	0	0	0
1013	RCHEM	23823	78534045	41787	78534045	whole-roc	M		61	1.42	15.2	0	2.63	1.06	0.05	2.19	6.36	7.3	1.44	0.06	0.51	0.21	0.4
1014	RCHEM	23834	78531234	2927	78531234	whole-roc	M		70.1	0.47	14.4	0	1.24	1.43	0.03	0.68	2.06	3.83	4.58	0.12	0.41	0.24	-0.05
1015	RCHEM	23865	78531139	3257	78531139	whole-roc	M		51.8	2.03	14.6	0	1.72	8.78	0.16	2.76	15.2	0.97	0.25	0.22	0.51	0.11	0.18
1016	RCHEM	23868	69200045	3320	69200045	whole-roc	M		50.6	1.91	13.15	0	4.21	13.7	0.33	4.79	7.08	3.39	0.26	0.19	0.18	0	-0.05
1017	RCHEM	23874	74205699	3382	74205699	whole-roc	M		49.55	1.74	13.28	0	3.15	8.3	0.18	6.96	9.9	2.03	1.4	0.15	1.97	0.11	0.05
1018	RCHEM	23880	78534270A	2577	78534270A	whole-roc	M		57.3	0.49	9.32	0	2.54	4.74	0.13	6.13	12.1	4.9	0.31	0.01	0.57	0.25	0.63
1019	RCHEM	23885	78531467	2929	78531467	whole-roc	M		53.8	1.18	14.9	0	3.81	5.86	0.09	4.34	7.03	4.29	2.27	0.47	0.94	0.23	-0.05
1020	RCHEM	23887	84536116	3227	84536116	whole-roc	M		70.71	0.38	13.9	0	1.55	1.65	0.03	0.7	1.56	3.37	4.97	0.09	0.88	0.2	0.17
1021	RCHEM	23941	78530166A	2354	78530166A	whole-roc	M		48.3	2.85	12.9	0	0.48	14.1	0.49	5.85	9.1	1.03	1.72	0.3	0.96	1.33	-0.05
1022	RCHEM	23984	78530496	2923	78530496	whole-roc	M		75	0.13	13.1	0	0.58	0.28	0.02	0.2	0.6	5.04	4.05	0.05	0.31	0.15	0.35
1023	RCHEM	24021	94531942	87446	94531942	whole-roc	M		46.29	1.42	12.77	14.9	5.14	8.78	0.15	6.17	8.49	0.98	0.38	0.1	0	0	0
1024	RCHEM	24118	94531984	87452	94531984	whole-roc	M		56.97	0.62	18.18	5.95	4.23	1.55	0.02	2.79	2.37	1.15	5.36	0.13	0	0	0
1025	RCHEM	24119	94531624	87402	94531624	whole-roc	M		77.13	0.58	10.23	3.06	1.93	1.02	0.04	0.51	0.88	2.28	0.91	0.04	0	0	0
1026	RCHEM	24179	94531881	87438	94531881	whole-roc	M		75.69	0.31	12.74	1.63	1.03	0.54	0.02	0.34	0.19	4.44	3.46	0.05	0	0	0
1027	RCHEM	24241	94531804	87428	94531804	whole-roc	M		67.19	0.53	14.89	5.16	4.23	0.84	0.06	1.59	0.3	0.74	5.53	0.07	0	0	0
1028	RCHEM	24501	78534372	39143	78534372	whole-roc	M		69.8	0.3	14.7	0	0.57	1.21	0.03	0.8	1.64	5.31	3.52	0.09	1	0.22	0.45
1029	RCHEM	24533	86206054	41882	86206054	whole-roc	M		71.78	0.33	13.16	0	1.75	0.92	0.02	0.45	0.85	3.3	5.83	0.05	0	0	0
1030	RCHEM	25005	94531738	87419	94531738	whole-roc	M		57.02	1.07	17.77	8.14	5.7	2.2	0.02	3.24	0.6	2.14	3.49	0.03	0	0	0
1031	RCHEM	25006	94531618	87401	94531618	whole-roc	M		67.83	0.87	10.22	6.6	2.9	3.33	0.13	1.75	2.88	0.75	1.36	0.05	0	0	0
1032	RCHEM	25026	94531726	87417	94531726	whole-roc	M		56.48	1.08	12.27	12.26	6.27	5.39	0.14	4.01	5.05	1.89	0.56	0.07	0	0	0
1033	RCHEM	25042	94531888	87439	94531888	whole-roc	M		73	0.34	13.49	2.91	2.19	0.65	0.1	0.63	0.54	3.6	3.05	0.02	0	0	0
1034	RCHEM	25043	94532174	87479	94532174	whole-roc	M		41.27	0.42	8.88	4.05	1.73	2.09	0.28	2.67	21.3	1.03	3.27	0.12	0	0	0
1035	RCHEM	25078	94531702	87413	94531702	whole-roc	M		49.58	1.84	13.03	15.02	3.57	10.3	0.21	6.45	8.36	3.34	0.36	0.16	0	0	0
1036	RCHEM	25079	94531720	87416	94531720	whole-roc	M		56.82	0.99	13.81	10.48	8.11	2.13	0.1	3.73	2.27	3.36	0.48	0.11	0	0	0
1037	RCHEM	25124	94532087	87467	94532087	whole-roc	M		78.46	0.43	9.79	4.14	2.2	1.75	0.03	1.04	0.48	1.29	2.36	0.08	0	0	0
1038	RCHEM	25720	92208001	40427	92208001	whole-roc	M		80.81	0.39	9.67	1.02	0.31	0.64	0.01	0.11	0.28	2.7	4.14	0.23	0	0	0
1039	RCHEM	25782	92208014	30794	92208014	whole-roc	M		79.25	0.28	11.75	0.49	0.08	0.37	0.01	0.14	1.07	5.35	0.95	0.05	0	0	0
1040	RCHEM	27044	86206064	39346	86206064	whole-roc	M		62.33	0.54	14.9	0	7.75	0.14	-0.01	0.01	0.01	0.1	13.44	0.05	0	0	0
1041	RCHEM	27046	86206020	7032	86206020	whole-roc	M		48.46	1.17	13.03	0	3.87	9.37	0.16	7.68	10.88	2.83	0.4	0.09	0	0	0
1042	RCHEM	27048	86206111	7108	86206111	whole-roc	M		69.97	0.64	12.45	0	2.91	3.18	0.15	0.42	3.33	3.5	2.04	0.16	0	0	0
1043	RCHEM	27066	86206120	7116	86206120	whole-roc	M		71.4	0.14	15.37	0	1.1	0.79	-0.01	0.26	1.79	6.88	0.64	0.05	0	0	0
1044	RCHEM	27067	F4/3044	7671	F4/3044	whole-roc	M		73.11	0.1	15.31	0	0.64	0.23	0.02	0.17	0.91	7.03	1.05	0.03	0	0	0
1045	RCHEM	27101	86206023	7033	86206023	whole-roc	M		72.05	0.34	13.25	0	1.53	1.08	0.01	0.41	1.16	4	4.65	0.07	0	0	0
1046	RCHEM	27127	86206021	41881	86206021	whole-roc	M		48.27	2.7	12.21	0	3.43	14.4	0.27	4.83	7.62	3.75	0.33	0.25	0	0	0
1047	RCHEM	27130	86206051	7060	86206051	whole-roc	M		64.04	0.78	14.36	0	2.92	3.37	0.06	1.87	3.64	3.82	3.32	0.24	0	0	0
1048	RCHEM	27131	86206056	7063	86206056	whole-roc	M		62.21	0.49	13.22	0	0.99	3.29	0.14	3.5	9.46	4.96	0.83	0.13	0	0	0
1049	RCHEM	27152	86206052	7061	86206052	whole-roc	M		71.2	0.35	13.81	0	1.61	1.04	0.02	0.73	1.85	3.55	4.71	0.09	0	0	0
1050	RCHEM	27178	86206084	47365	86206084	whole-roc	M		66.72	0.59	15.13	0	2.55	1.46	0.03	0.96	2.5	5.69	3.31	0.17	0	0	0
1051	RCHEM	27196	86206055	7062	86206055	whole-roc	M		72.34	0.33	13.14	0	1.78	0.9	-0.01	0.38	1.2	3.39	5.23	0.05	0	0	0
1052	RCHEM	27208	86206008	7022	86206008	whole-roc	M		75.76	0.13	15.96	0	0.52	0.17	-0.01	0.11	0.01	0.19	4.79	-0.01	0	0	0
1053	RCHEM	27237	86206126	39353	86206126	whole-roc	M		68.11	0.55	14.82	0	1.75	1.41	0.03	0.71	2.41	4.53	4.18	0.12	0	0	0
1054	RCHEM	27735	69200102	3315	69200102	whole-roc	M		47.41	1.74	14.98	0	4.87	11.1	0.21	4.48	8.6	3.29	0.72	0.17	0.24	0	0.2
1055	RCHEM	27744	84536112	3223	84536112	whole-roc	M		69.4	0.48	13.95	0	2.34	1.07	0.02	0.99	2.28	6.27	0.94	0.09	0.67	0.15	0.87
1056	RCHEM	27766	84536114	3225	84536114	whole-roc	M		70.66	0.41	13.71	0	2.03	1.22	0.02	1.05	1.55	3.28	4.46	0.1	0.71	0.1	0.11
1057	RCHEM	27808	69200058B	3322	69200058B	whole-roc	M		45.9	1.23	13.17	0	3.23	11.9	0.33	6.42	10.67	2.17	0.86	0.13	0.6	0	0.65
1058	RCHEM	27878	78531458	2928	78531458	whole-roc	M		70.3	0.45	13.6	0	1.06	0.73	0.02	0.87	2.54	7.3	1.46	0.85	0.25	0.27	0.15
1059	RCHEM	27881	78531315	2574	78531315	whole-roc	M		71.7	0.36	13.9	0	0.49	0.52	0.02	1.11	2.3	4.87	2.88	0.1	0.52	0.19	0.27
1060	RCHEM	28168	94531786	87425	94531786	whole-roc	M		69.72	0.5	14.78	3.56	2.93	0.57	0.08	1.52	0.43	0.88	4.33	0.05	0	0	0
1061	RCHEM	28186	94531750	87420	94531750	whole-roc	M		66.43	0.52	17.66	3.94	3.43	0.46	0.02	1.12	0.18	0.15	5.25	0.05	0	0	0

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1062	RCHEM	28203	94531696	87412	94531696	whole-roc	M	48.92	2.07	12.37	16.05	3.67	11.14	0.22	5.45	8.87	3.35	0.35	0.18	0	0	0
1063	RCHEM	28548	86206060	7067	86206060	whole-roc	M	66.64	0.85	15.91	0	1.29	0.93	0.02	1.07	3	8.62	0.74	0.24	0	0	0
1064	RCHEM	28920	94531685	88466	94531685	whole-roc	M	51.71	1.08	13.04	12.48	2.27	9.19	0.17	6.69	9.88	2.27	0.54	0.06	0	0	0
1065	RCHEM	28940	94532140	87474	94532140	whole-roc	M	67.67	0.61	14.66	6.9	1.39	4.96	0.07	1.88	0.59	1.27	3.58	0.13	0	0	0
1066	RCHEM	29021	94531810	87429	94531810	whole-roc	M	70.04	0.54	12.9	5.08	4.42	0.59	0.03	1.12	0.43	1.33	4.64	0.04	0	0	0
1067	RCHEM	29068	94531852	87435	94531852	whole-roc	M	50.14	1.49	12.91	14.94	3.83	10	0.17	6.1	7.19	3.18	0.61	0.11	0	0	0
1068	RCHEM	29667	92208002	30790	92208002	whole-roc	M	84.1	0.31	6.79	3.37	1.41	1.76	0.05	0.47	0.89	0.96	2.38	0.13	0	0	0
1069	RCHEM	29686	92208018	30792	92208018	whole-roc	M	85.99	0.23	8.25	0.1	0.1	0	0	0.04	0.15	4.01	0.43	0.09	0	0	0
1070	RCHEM	29702	92208003	30791	92208003	whole-roc	M	67.25	0.55	14.31	5.38	2.35	2.73	0.05	1.76	3.01	3	3.33	0.15	0	0	0
1071	RCHEM	30292	88206019	39636	88206019	whole-roc	M	64.37	0.2	16.76	2.21	2.04	0.15	0.01	0.04	0.03	0.17	14.92	0.06	0	0	0
1072	RCHEM	30319	88206016	39635	88206016	whole-roc	M	79.05	0.34	9.84	1.23	1.09	0.13	0.02	0.13	0.25	1.1	7.04	0.09	0	0	0
1073	RCHEM	31020	86206006	7020	86206006	whole-roc	M	90.79	0.19	5	0	0.09	0.12	-0.01	0.05	0.07	2.78	0.16	0.03	0	0	0
1074	RCHEM	31024	86206007	7021	86206007	whole-roc	M	72.08	0.14	15.11	0	0.27	0.1	0.02	0.11	1.87	8.4	0.1	0.03	0	0	0
1075	RCHEM	31030	86206081	7084	86206081	whole-roc	M	52.22	1.63	15.55	0	4.82	5.69	0.14	3.69	6.39	4.7	2.52	0.63	0	0	0
1076	RCHEM	31065	86206091	7091	86206091	whole-roc	M	60.55	1.36	20.81	0	1.53	1.48	0.03	0.11	4.02	7	1.72	0.06	0	0	0
1077	RCHEM	31084	86206003	39340	86206003	whole-roc	M	47.54	1.04	14.1	0	2.1	9.7	0.19	8.43	10.95	2.28	0.36	0.08	0	0	0
1078	RCHEM	31085	86206086	47366	86206086	whole-roc	M	74.91	0.21	13.76	0	0.65	0.34	-0.01	0.46	0.56	7.73	0.09	0.07	0	0	0
1079	RCHEM	31144	86206121	7117	86206121	whole-roc	M	71.97	0.17	15.02	0	0.76	0.53	-0.01	0.27	1.73	6.81	0.54	0.05	0	0	0
1080	RCHEM	31166	86206139	7131	86206139	whole-roc	M	68.64	0.47	15.47	0	1.02	3.31	0.07	1.25	0.73	1.56	4.29	0.14	0	0	0
1081	RCHEM	31174	86206068	7073	86206068	whole-roc	M	76.92	0.02	13.35	0	0.11	0.09	-0.01	-0.01	0.01	0.08	4.97	0.02	0	0	0
1082	RCHEM	31175	86206089	7089	86206089	whole-roc	M	75.64	0.18	12.63	0	1	0.47	-0.01	0.09	0.83	3.73	4.68	0.02	0	0	0
1083	RCHEM	31201	86206131	7125	86206131	whole-roc	M	10.06	1.02	0.26	0	73.86	11.52	0.04	0.4	0.02	0.02	0.02	0.08	0	0	0
1084	RCHEM	31619	69200026	3316	69200026	whole-roc	M	52.32	0.9	12.26	0	5.47	6.1	0.05	6.33	8.32	4.65	0.38	0.11	0.58	0	0.5
1085	RCHEM	31648	69200031/	3308	69200031A	whole-roc	M	47.56	2.89	12.57	0	5.4	12.9	0.3	4.79	8.78	2.89	0.59	0.28	0.26	0	-0.05
1086	RCHEM	31679	69200032/	3309	69200032A	whole-roc	M	46.1	2.64	12.06	0	4.22	13.5	0.33	4.92	7.16	2.16	2.57	0.26	0.49	0	1.25
1087	RCHEM	31741	84536108	3220	84536108	whole-roc	M	71.22	0.37	13.8	0	1.86	1.64	0.04	0.56	1.57	3.87	3.87	0.1	0.47	0.1	0.07
1088	RCHEM	31837	78534387	2836	78534387	whole-roc	M	67.3	0.68	13.3	0	2.91	3.46	0.06	0.76	2.02	3.75	4.6	0.21	0.63	0.24	0.25
1089	RCHEM	31873	78530270	2939	78530270	whole-roc	M	57.6	0.6	8.6	0	1.69	4.98	0.12	6.5	13	4.75	0.58	0.06	0.44	0.47	0.1
1090	RCHEM	31883	78530903	2833	78530903	whole-roc	M	70.2	0.4	13.8	0	1.95	1.5	0.02	1.15	1.68	3.58	4.65	0.12	0.74	0.2	0.3
1091	RCHEM	31903	78531139/	2941	78531139A	whole-roc	M	68.7	1.28	11.9	0	0.52	3.44	0.07	1.29	10.2	0.96	0.4	0.36	0.18	0.25	0.05
1092	RCHEM	31907	78531103	39106	78531103	whole-roc	M	74.7	0.1	13.1	0	0.89	0.17	0.01	0.44	0.4	3.97	4.65	0.04	0.3	0.2	0.11
1093	RCHEM	31920	78534387/	39127	78534387A	whole-roc	M	63.7	1.14	13.2	0	2.34	6.18	0.11	1.22	2.63	3.67	4.02	0.33	0.76	0.25	0.25

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159	Cd	In	Sn	Sb	Te	Cs	Ba	La	Ce	Pr	Nd	Sm	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Ta
160	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
161	6.09	0.1	0.91	1.6	0.33	0.79	105.5	4.61	11.23	3.37	9.95	3.19	4.06	1.26	4.41	1.67	2.81	0.78	2.42	0.76	1.19
162	6.85	0.13	1.11	0.89	0.06	0.21	94.16	5.15	12.68	3.83	11.37	3.64	4.35	1.37	5.1	1.91	3.17	0.86	2.74	0.82	0.98
163	6.73	0.07	1.2	0.78	0.12	0.1	30.84	13.34	26.08	7.82	22.3	7.41	11.73	4.06	17.13	6.25	10.82	2.72	8.92	2.39	3.26
164	6.15	0.22	2.64	0.64	0.09	0.11	48.12	10.58	26.81	7.93	24.81	7.84	9.71	2.79	10.8	3.93	6.6	1.61	5.54	1.54	1.85
165	6.03	0.22	2.95	0.59	0.3	0.15	51.26	10.48	18.7	5.73	16.51	5.15	6.55	1.93	7.73	2.79	4.88	1.2	4.12	1.1	0.97
166	5.74	0.14	2.24	0.72	0.06	0.1	40.7	6.21	16	4.64	14.05	4.93	6.7	2.02	7.87	2.84	4.8	1.19	4.05	1.08	1.03
167	6.88	0.09276	1.732	0.4898	0.2611	0.8912	229.9	6.269	14.72	4.036	11.3	3.307	4.222	1.235	4.662	1.701	2.789	0.7157	2.357	0.6065	1.037
168	6.11	0.08	1.3	0.63	0.27	0.79	101.3	6.76	14.64	3.72	10.53	3.05	3.74	1.09	4.34	1.48	2.52	0.63	2.1	0.55	0.79
169	6.18	0.12	2.19	0.38	0.12	0.56	134.3	11.75	25.98	6.47	17.56	4.77	5.79	1.68	6.32	2.25	3.86	0.93	3.16	0.83	1.06
170	6.67	0.2	3.08	0.42	0.26	0.1	426.3	16.53	35.39	10.11	28.91	9.38	11.44	3.42	12.59	4.26	7.25	1.68	5.74	1.45	1.9
171	6.28	0.08	1.25	0.47	0.22	0.12	17.24	4.38	11.18	3.15	9.71	2.9	3.86	1.15	4.55	1.61	2.61	0.66	2.25	0.58	0.84
172	6.55	0.08	1.44	0.79	0.12	0.16	30.8	3.74	9.75	2.79	8.51	2.64	3.51	1.06	4.05	1.48	2.43	0.62	2.11	0.53	0.6
173	5.94	0.18	4.4	9.88	0.31	0.15	10.34	20.94	58.07	14.9	35.89	7.2	7.49	1.99	6.98	2.33	3.84	0.89	2.92	0.69	1.51
174	6.07	0.1	1.42	2.02	0.36	2.3	526.5	14.76	29.91	7.05	18.02	4.24	4.66	1.22	4.63	1.61	2.56	0.65	2.15	0.57	0.99
175	6.62	0.12	1.52	3.58	0.16	1.35	291.3	18.98	39.62	9.38	23.56	5.2	5.69	1.49	5.43	1.89	3.11	0.74	2.48	0.64	0.93
176	6.293	0.1012	1.102	0.2697	0.09715	0.2762	146	6.985	15.7	4.208	11.66	3.25	4.049	1.135	4.343	1.587	2.646	0.6465	2.178	0.5974	0.9148
177	6.13	0.1	2.97	0.27	0.12	1.35	582.1	63.03	117.6	25.92	57.51	10.47	10.6	2.38	8.36	2.78	4.57	1.12	3.8	0.98	2.52

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
178	6.56	0.1	2.98	0.25	0.19	1.28	570.6	62.39	116.7	25.34	57.03	10.52	10.5	2.4	8.4	2.75	4.53	1.1	3.73	0.99	2.5
179	6.51	0.01	0.51	0.14	0.03	0.01	3.68	0.05	0.13	0.03	0.1	0.02	0.03	0.01	0.04	0.01	0.02	0.01	0.05	0.01	0.03
180	6.86	0.09	1.25	1.74	1.06	0.83	44.86	4.74	8.45	1.61	3.4	0.57	0.58	0.14	0.51	0.17	0.29	0.07	0.26	0.09	0.17
181	9.14	0.26	1.57	2.24	5.93	1.9	61.07	0.98	2.38	0.63	1.94	0.65	0.79	0.23	1.33	0.36	0.69	0.17	0.6	0.17	0.21
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191	JCU_PWD	JCU_PWD	JCU_PWD	JCU_PWD	JCU_PWD	JCU_PWD	JCU_PWD	JCU_PWD	JCU_PWD	JCU_PWD	JCU_PWDR										
192	Eu	Gd	Tb	Dy	Ho	Er	Tm	Lu	Hf	Th	U										
193	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01										
194	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm										
195	0.94	2.11	0.27	3.81	0.32	1.85	0.11	0.18	0.45	0.31	0.11										
196	1.03	3.36	0.36	4.31	0.41	2.32	0.17	0.19	0.85	0.34	0.08										
197	3.22	9.72	0.87	10.57	1.29	7.04	0.53	0.62	4.46	1.85	1.05										
198	1.58	4.28	0.39	4.33	0.45	2.34	0.18	0.2	2.66	1.39	0.61										
199	0.96	3.31	0.29	4.06	0.33	2.28	0.15	0.17	1.79	1.3	0.37										
200	0.98	4.13	0.4	4.22	0.46	2.47	0.16	0.18	2.24	1.24	0.37										
201	1.93	4.43	0.49	5.86	0.66	3.27	0.26	0.3	2.06	1	0.67										
202	0.83	3.82	0.34	4.89	0.48	2.9	0.25	0.24	2.07	1.69	0.59										
203	1.23	4.6	0.42	4.8	0.49	3.1	0.25	0.18	1.69	1.58	1.1										
204	1.09	4.09	0.35	5.44	0.49	3.02	0.22	0.23	1.44	0.37	0.41										
205	1.44	5.52	0.48	5.11	0.54	3.03	0.22	0.27	2.71	1.01	0.46										
206	1.35	4.69	0.39	4.79	0.54	2.89	0.24	0.23	2.42	1.03	0.32										
207	1.87	6.12	0.49	5.93	0.66	4.39	0.24	0.35	3.11	1.32	0.45										
208	1.31	4.68	0.42	5.85	0.51	3.37	0.24	0.29	2.17	0.55	0.17										
209	1	3.32	0.32	3.34	0.38	2.1	0.16	0.16	1.48	1.13	0.27										
210	1.22	4.62	0.53	6.05	0.63	3.62	0.3	0.32	2.03	0.85	0.37										
211	1.78	4.7	0.54	6.71	0.72	5.45	0.34	0.42	3.89	1.04	0.45										
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284	Distance tc	SiO2	TiO2	Al2O3	Fe2O3T	MnO	MgO	CaO	Na2O	K2O	P2O5	S	F	LOI	Total		Ag	As	Au	Ba	Bi
285		62.18	0.90	15.78	6.18	0.03	1.83	4.08	5.24	2.64	0.19	0.01	0.07	0.96	100.22			2		489	
286		57.54	1.30	16.26	9.06	0.06	2.54	5.13	4.83	2.30	0.26	0.01	0.04	0.12	99.57			1		391	
287		59.10	1.14	15.40	7.69	0.05	2.29	4.97	4.82	2.40	0.22	0.02	0.09	0.95	99.27			1		448	
288		61.42	0.94	16.21	6.21	0.04	2.23	2.53	7.68	1.59	0.20		0.18	1.11	100.43			2		217	
289		56.44	1.56	16.29	9.49	0.11	2.32	3.61	7.79	0.78	0.48		0.10	0.87	99.94			3		134	
290		58.80	0.85	18.37	6.25	0.07	1.79	2.65	8.93	0.59	0.25		0.14	1.12	99.90			4		139	
291		56.91	1.07	15.88	8.50	0.11	4.64	4.50	6.45	1.39	0.16		0.06	0.93	100.73			1		283	
292		56.76	1.08	15.55	9.40	0.13	4.55	4.74	4.76	2.15	0.22	0.01	0.09	1.30	100.89			2		458	
293		51.02	1.41	13.31	13.64	0.21	6.23	8.75	3.73	0.23	0.12			0.38	99.62					81	
294		49.82	1.80	13.65	15.35	0.20	5.74	7.50	4.23	0.27	0.16			1.42	98.58					38	
295		50.85	1.35	13.60	12.97	0.18	6.54	9.31	3.22	0.43	0.12			0.70	99.30					51	

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
296		48.59	1.34	12.01	15.41	0.20	8.03	9.55	2.77	0.35	0.04			0.28	99.72					45	
297		48.97	1.53	13.87	14.22	0.17	5.97	8.80	3.93	0.28	0.13			0.43	99.57					58	
298		49.26	1.30	14.55	13.16	0.20	6.32	9.20	2.91	0.71	0.09			0.77	99.23					117	
299		49.44	1.19	15.62	11.51	0.18	6.80	10.12	2.84	0.50	0.10			0.70	99.30					67	
300		47.24	0.80	15.73	11.02	0.10	8.54	7.75	3.52	2.80	0.06			1.50	98.50					277	
301		48.30	0.94	14.51	12.01	0.10	7.10	8.38	4.32	1.79	0.07			1.04	98.96					166	
302		47.24	0.80	15.73	11.02	0.10	8.54	7.75	3.52	2.80	0.06			1.50	98.50					277	
303		48.30	0.94	14.51	12.01	0.10	7.10	8.38	4.32	1.79	0.07			1.04	98.96					166	
304		52.70	0.62	17.97	5.53	0.06	3.07	8.52	6.94	0.92	0.04			1.34	98.66					71	
305		49.40	1.30	14.11	12.31	0.12	6.43	8.70	4.53	1.07	0.11			0.64	99.36					85	
306		48.50	1.02	15.16	10.88	0.09	4.70	9.40	5.41	1.06	0.13			1.40	98.60					56	
307		48.49	1.07	15.46	11.55	0.12	5.71	9.11	4.39	1.25	0.07			1.03	98.97					82	
308		49.10	1.74	12.90	19.90	0.26	5.55	7.17	2.29	0.87	0.16			0.01	100.20					62	
309		46.20	1.67	13.20	20.50	0.28	5.30	7.93	3.19	0.44	0.14			0.28	99.10					202	
310		48.80	1.42	13.10	18.50	0.26	6.26	6.81	3.37	0.21	0.13	0.01		0.30	99.20					9	
311		48.40	1.49	13.50	16.20	0.30	6.65	9.00	3.42	0.28	0.12			0.50	99.90					66	
312		49.40	1.26	14.10	15.50	0.20	5.57	9.55	2.91	0.87	0.13			0.68	100.20					81	
313		48.70	1.45	13.90	13.90	0.21	7.05	11.30	2.56	0.64	0.13			0.69	100.50					121	
314		49.30	1.70	13.60	17.00	0.36	6.12	9.62	1.17	0.57	0.15			0.84	100.50					179	
315		47.20	1.87	13.00	18.40	0.42	5.75	9.24	3.32	0.40	0.16	0.01		0.19	99.90					97	
316		50.50	1.01	12.20	11.40	0.17	7.67	10.20	3.46	0.89	0.41	0.20		1.58	99.70					592	
317		70.50	0.44	12.50	5.81	0.08	0.89	2.02	6.21	0.27	0.08			0.30	99.20			5		50	
318		69.60	0.54	12.50	7.10	bd	0.50	1.31	6.99	0.25	0.12	0.01		0.11	99.00			4		93	
319		70.00	0.68	13.40	7.14	bd	0.42	1.73	6.62	0.30	0.15			0.03	100.50			3		15	
320		46.20	1.67	13.20	20.50	0.28	5.30	7.93	3.19	0.44	0.14			0.28	99.10					28	
321		47.10	1.60	15.50	15.50	0.12	5.12	8.89	2.86	1.81	0.07			1.51	100.10					99	
322		47.90	1.42	14.80	15.50	0.25	6.56	9.46	3.05	0.66	0.12	0.01		0.60	100.30					132	
323		48.90	2.04	12.80	17.60	0.23	4.08	7.30	3.80	1.52	0.19	0.01		0.97	99.40					432	
324		49.70	1.12	15.20	10.90	0.15	6.76	11.20	2.88	1.63	0.09			1.42	100.90					243	
325		47.38	1.39	12.90	15.40	0.14	7.29	9.43	2.46	1.85	0.09	0.01		1.47	100.20					441	
326		49.36	3.16	14.03	10.55	0.17	1.24	16.78	1.68	0.48	0.36				97.81						
327		62.70	2.13	10.57	8.93	0.23	1.12	10.49	1.13	1.59	0.38				99.27						
328		42.48	2.81	13.75	14.49	1.29	1.74	18.84	0.37	0.25	0.24				96.27			4			
329		36.85	2.61	14.72	19.26	1.17	3.59	14.90	0.63	1.23	0.35			0.59	95.28						
330		37.61	1.83	14.00	18.31	1.50	3.25	15.38	0.33	0.35	0.35				92.91						
331		47.97	0.86	15.60	14.64	0.64	2.39	12.90	1.80	1.03	0.12				97.93			6			
332		58.62	1.22	11.75	10.74	0.55	1.72	12.91	1.02	0.31	0.29				99.12			7			
333		58.77	0.80	12.87	14.53	0.66	1.90	8.71	0.24	0.87	0.07				99.25						
334		47.93	1.37	16.11	13.19	0.28	4.12	8.44	3.66	1.48	0.13			1.43	98.13			5		335	
335		47.66	1.59	13.23	16.00	0.41	5.85	9.57	2.46	0.47	0.14			0.42	97.80			5		69	
336		48.58	2.10	14.04	14.48	0.50	4.39	10.74	2.48	0.49	0.14			0.36	98.31			5		85	
337		47.43	1.16	14.05	14.39	0.42	6.76	10.83	1.98	0.31	0.10			0.81	98.24			5		188	
338		48.13	1.45	13.26	14.59	0.62	5.80	11.17	1.65	0.77	0.12			0.56	98.13			5		151	
339		48.24	1.42	14.34	14.80	0.40	5.94	9.91	2.45	0.58	0.13			0.72	98.92			5		666	
340		48.94	1.37	12.23	14.22	0.38	7.08	11.76	1.68	0.50	0.12			0.75	99.04			5		83	
341		47.86	1.31	14.93	12.90	0.37	5.53	11.42	2.14	0.60	0.12			0.92	98.09			5		164	
342	22.00	48.50	2.03	13.58	15.67	0.25	5.68	9.19	1.99	1.16	0.20				98.25			5			
343	17.00	48.53	1.40	13.64	14.13	0.22	5.94	10.57	2.47	0.95	0.14				97.99			5			
344	8.50	48.61	1.80	13.57	15.04	0.21	5.37	10.86	2.30	0.74	0.17				98.65			5			
345	7.00	49.34	2.25	13.23	16.21	0.26	5.07	8.76	2.81	0.59	0.29				98.81			7			
346	6.00	47.85	1.88	13.73	18.08	0.25	5.94	5.85	0.63	3.03	0.19				97.44			5			
347	-15.00	48.06	2.77	12.93	17.75	0.42	6.19	8.35	0.53	1.24	0.26				98.51			5			
348	-17.00	49.00	1.59	13.75	15.76	0.24	6.01	10.55	0.87	1.00	0.14				98.92			5			
349	104.50	44.61	1.52	14.04	16.12	0.24	7.28	10.98	2.14	0.70	0.08				97.71			5			
350	64.50	44.38	1.34	13.87	16.19	0.33	5.68	11.39	2.70	0.82	0.12				96.82			5			
351	50.00	49.26	1.41	13.45	15.53	0.25	6.43	9.70	1.21	0.95	0.12				98.32			5			
352	42.00	48.09	1.52	13.30	15.14	0.22	6.11	10.79	1.99	0.75	0.13				98.04			5			
353	6.00	47.31	2.88	12.71	18.77	0.44	6.28	7.50	0.51	1.56	0.28				98.23			9			
354	1.00	45.90	2.27	12.52	18.14	0.35	6.74	9.09	0.80	1.57	0.19				97.56			7			

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
355	-3.50	47.96	3.07	13.42	18.24	0.34	4.98	5.94	0.42	2.93	0.32				97.62			13			
356	-14.00	46.16	1.47	13.89	16.34	0.29	7.15	8.75	1.59	1.38	0.13				97.13			5			
357	136.50	49.36	1.81	14.22	17.32	0.24	3.42	6.74	3.10	1.21	0.21				97.63			5			
358	134.50	52.52	1.79	13.45	18.53	0.18	4.44	4.39	1.57	1.52	0.30				98.69			5			
359	122.00	47.75	1.96	15.47	16.55	0.39	5.87	2.75	0.59	4.67	0.11				96.11			5			
360	118.00	51.03	2.32	12.14	18.05	0.30	4.24	7.49	2.17	0.56	0.25				98.57			5			
361	110.00	49.07	2.78	12.83	18.82	0.25	4.41	6.45	0.96	2.21	0.26				98.04			5			
362	21.00	48.76	3.20	12.85	19.09	0.37	5.05	5.41	0.51	2.88	0.36				98.49			5			
363	15.00	48.25	0.95	14.26	12.89	0.22	7.30	10.24	2.12	1.36	0.08				97.66			5			
364		48.07	1.41	13.25	15.84	0.28	6.26	9.53	1.97	0.99	0.12				97.71			5			
365	8.50	48.94	2.44	13.29	19.20	0.37	5.85	5.19	0.51	1.48	0.23				97.49			6			
366	5.00	48.73	1.13	13.95	14.43	0.25	6.44	10.31	0.66	1.47	0.10				97.45			5			
367	-29.00	47.27	1.51	13.56	14.17	0.20	6.45	11.61	2.30	0.40	0.14				97.60			5			
368	116.00	48.52	1.32	13.47	14.23	0.20	6.64	11.21	2.39	0.39	0.11				98.47			5			
369	96.50	47.86	1.51	13.37	14.99	0.21	6.37	10.96	2.35	0.60	0.11				98.33			5			
370	88.50	47.98	2.05	14.39	15.10	0.27	5.36	9.07	1.90	1.31	0.16				97.59			5			
371	57.00	48.00	1.43	13.50	14.44	0.24	6.34	10.47	2.57	0.54	0.12				97.65			5			
372	22.00																				
373	17.00																				
374	8.50																				
375	7.00																				
376	6.00																				
377	-15.00																				
378	-17.00																				
379	104.50																				
380	64.50																				
381	50.00																				
382	42.00																				
383	6.00																				
384	1.00																				
385	-3.50																				
386	-14.00																				
387	136.50																				
388	134.50																				
389	122.00																				
390	118.00																				
391	110.00																				
392	21.00																				
393	15.00																				
394																					
395	8.50																				
396	5.00																				
397	-29.00																				
398	116.00																				
399	96.50																				
400	88.50																				
401	57.00																				
402	22.00																				
403	17.00																				
404	8.50																				
405	7.00																				
406	6.00																				
407	-15.00																	3			
408	-17.00																				
409	104.50																				
410	64.50																				
411	50.00																				
412	42.00																				
413	6.00																				

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
414	1.00																	7			
415	-3.50																	10			
416	-14.00																				
417	136.50																				
418	134.50																				
419	122.00																				
420	118.00																				
421	110.00																				
422	21.00																				
423	15.00																				
424																					
425	8.50																				
426	5.00																				
427	-29.00																				
428	116.00																				
429	96.50																				
430	88.50																				
431	57.00																				
432		48.90	1.27	13.38	15.56	0.29	7.41	10.07	2.12	0.74	0.10	0.01		0.72	100.53			36			
433		48.46	1.25	13.41	15.64	0.36	7.38	9.96	1.59	1.65	0.10	0.03		0.63	100.47			16			
434		46.78	1.24	12.60	17.64	0.31	7.99	7.53	1.21	2.39	0.10	0.02		1.28	99.11			90			
435		48.25	1.20	13.01	15.67	0.32	7.68	9.71	1.52	1.71	0.09	0.07		0.96	100.19			67			
436		48.44	1.01	11.89	13.19	0.25	7.70	12.29	1.72	1.44	0.08	0.07		1.02	99.11			26			
437		48.80	1.35	13.41	15.77	0.25	7.31	9.82	2.45	0.68	0.10	0.01		0.51	100.46			29			
438		48.40	1.60	13.73	16.47	0.30	6.15	9.61	2.36	0.98	0.11	0.01		0.49	100.21			33			
439		35.96	1.23	15.09	29.93	0.47	6.29	5.65	0.47	1.94	0.09	0.06		2.05	99.23			182			
440		49.27	1.09	13.76	13.09	0.23	7.80	9.34	1.15	2.47	0.08	0.06		1.75	100.09			12			
441		49.23	1.24	13.14	14.89	0.34	7.67	8.53	1.32	1.60	0.10	0.02		1.52	99.61			196			
442		48.91	1.20	13.15	14.01	0.24	8.45	10.14	1.96	0.74	0.08	0.02		1.34	100.26			18			
443		49.16	1.11	12.94	13.61	0.25	8.60	10.65	1.76	1.38	0.09	0.05		0.84	100.44			7			
444		48.54	1.36	13.96	14.87	0.32	6.64	9.11	2.59	1.47	0.12	0.05		1.00	100.03			30			
445		49.18	1.39	15.06	13.36	0.22	6.43	10.40	2.65	0.65	0.11	0.01		0.79	100.25			18			
446		49.51	1.18	13.79	13.45	0.24	7.57	10.08	1.87	1.11	0.10	0.04		1.14	100.08			27			
447		53.03	1.04	13.41	12.89	0.33	5.69	9.49	1.66	1.61	0.10	0.02		1.28	100.54			34			
448		48.71	1.20	13.42	13.81	0.24	8.10	10.31	1.87	1.09	0.10	0.02		0.97	99.84			62			
449		51.81	1.14	9.43	12.44	0.27	10.70	9.51	2.16	0.86	0.07			2.21	100.61			12			
450		48.92	1.13	13.77	13.40	0.23	7.67	11.30	1.96	0.90	0.09	0.06		0.89	100.31			8			
451		48.50	1.18	13.03	13.94	0.25	8.73	10.14	2.15	0.75	0.10	0.03		1.27	100.07			276			
452		49.29	1.24	14.17	14.28	0.30	6.91	11.73	1.79	0.46	0.10	0.03		0.32	100.64			11			
453		49.93	1.25	12.34	13.58	0.25	6.65	12.30	1.75	0.49	0.11	0.04		0.29	99.00			12			
454		48.72	1.26	12.66	14.28	0.25	5.99	11.80	2.18	0.80	0.10	0.10		0.81	98.95			5			
455		45.48	1.60	14.84	17.56	0.33	6.09	10.10	1.93	1.40	0.11	0.10		0.67	100.22			5			
456		49.01	1.61	14.75	16.07	0.28	4.95	9.93	2.50	0.85	0.12	0.06		0.37	100.49			8			
457		43.70	1.71	13.55	19.00	0.31	5.18	9.67	2.84	1.10	0.15	0.14		1.49	98.84			17			
458		51.18	1.70	16.11	15.56	0.27	3.13	8.87	2.69	0.79	0.17	0.01		0.10	100.58			5			
459		54.29	1.90	13.73	15.52	0.34	2.78	8.14	2.66	0.78	0.22	0.03		0.15	100.52			6			
460		51.14	1.65	16.05	15.47	0.32	3.08	8.39	2.85	1.17	0.14	0.04		0.34	100.63			5			
461		48.75	1.26	13.84	13.92	0.22	7.51	12.03	1.94	0.44	0.10	0.08		0.56	100.64			7			
462		48.81	1.09	14.13	14.89	0.25	6.84	11.12	2.12	0.57	0.09	0.05		0.35	100.31			5			
463		48.44	1.40	14.48	17.09	0.27	5.44	8.63	2.28	1.14	0.11	0.05		0.72	100.05			5			
464		49.08	1.39	15.87	14.01	0.26	5.18	11.58	1.58	0.67	0.12	0.03		0.31	100.07			5			
465		48.64	1.26	13.50	15.32	0.29	7.04	10.84	1.68	1.12	0.10	0.03		0.61	100.43			19			
466		49.02	1.22	13.35	14.32	0.27	7.65	9.36	1.62	1.49	0.09	0.01		1.43	99.82			56			
467		48.72	1.18	12.95	13.66	0.26	7.78	9.43	2.22	1.24	0.10	0.04		2.43	100.01			16			
468		49.04	1.14	13.83	13.85	0.27	7.49	11.49	1.87	0.76	0.10	0.01		0.73	100.57			7			
469		48.64	1.34	14.38	15.42	0.32	6.05	9.66	2.26	1.07	0.12	0.01		0.77	100.04			6			
470		50.23	1.71	14.85	16.17	0.28	3.88	9.20	2.63	0.67	0.16			0.20	99.98			5			
471		50.29	1.70	14.76	16.37	0.28	3.65	8.38	2.79	0.97	0.17	0.01		0.80	100.16			5			
472		49.83	1.74	16.39	15.43	0.27	3.29	9.04	3.14	0.82	0.15	0.02		0.34	100.46			12			

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
473		49.44	1.29	13.87	14.17	0.24	6.83	10.88	2.38	0.75	0.10	0.04		0.55	100.54			11			
474		48.43	1.59	12.83	15.18	0.19	6.11	9.27	4.05	0.38	0.13			1.15	99.32			5			
475		47.91	1.76	12.92	14.01	0.08	5.72	8.94	4.41	0.32	0.13			0.76	96.92			7			
476		46.87	1.63	13.03	16.32	0.16	7.27	7.04	2.55	0.72	0.13			3.00	98.72			5			
477		47.93	1.60	12.74	15.15	0.11	6.65	7.62	3.20	0.70	0.14			3.13	98.96			5			
478		47.35	1.57	12.58	15.04	0.20	6.16	9.50	3.75	0.50	0.13			1.36	98.13			5			
479		48.86	1.65	12.17	18.76	0.07	8.27	0.77	1.37	3.74	0.14			4.57	98.37			5			
480		49.10	1.48	13.51	13.34	0.08	6.05	5.71	4.74	0.26	0.13			3.39	97.79			5			
481		48.59	1.52	13.60	15.75	0.19	6.74	9.02	3.47	0.55	0.13			1.05	100.64			5			
482		48.60	1.54	13.45	16.14	0.20	6.59	9.13	2.69	0.67	0.13			1.15	100.30			8			
483		44.71	1.06	18.50	11.00	0.20	3.95	16.87	0.84	1.67	0.14			2.19	101.12					425	
484		47.59	1.77	13.30	16.07	0.20	5.14	12.12	1.11	0.53	0.17			0.66	98.67					245	
485		50.66	0.50	18.78	6.11	0.10	5.81	10.96	3.02	1.27	0.11			2.53	99.85					653	
486		50.29	0.69	16.74	8.07	0.12	7.08	11.91	2.43	1.20	0.09			0.97	99.59					684	
487		72.00	0.22	14.20	0.95	0.00	0.23	0.35	6.92	0.21	0.05	0.00	0.02	3.27	98.42			0			
488		71.44	0.21	15.60	2.42	0.01	1.13	0.23	8.00	0.66	0.05	0.01	0.02	0.91	100.70			1			
489		48.11	1.52	14.18	25.23	0.02	1.08	2.10	5.70	3.15	0.12	0.04	0.00	0.45	101.67			2			
490		49.15	1.53	12.60	21.64	0.05	4.68	0.51	4.02	0.70	0.19	0.01	0.04	3.55	98.67			0			
491		48.41	1.49	14.11	20.84	0.03	4.91	0.45	4.91	0.17	0.25	0.00	0.03	3.58	99.17			0			
492		52.11	0.55	13.32	6.35	0.08	4.37	8.11	2.18	4.41	0.14	0.02	0.00	8.50	100.13			1			
493		60.04	0.72	16.01	6.46	0.03	2.92	2.05	3.01	5.41	0.16	0.00	0.00	4.01	100.81			1			
494		39.72	1.12	15.55	19.27	0.07	6.56	5.80	3.60	1.32	0.09	0.08	0.00	4.99	98.15			1			
495		45.50	1.05	15.74	13.34	0.05	5.07	5.27	2.91	4.41	0.11	0.22	0.00	4.93	98.58			0			
496		56.21	1.15	16.21	5.77	0.02	2.57	4.10	7.21	1.26	0.23	0.01	0.00	2.89	97.62			1			
497		48.12	0.98	15.14	12.61	0.02	2.51	5.88	4.53	4.43	0.11	0.31	0.00	4.20	98.84			0			
498																			-5.00		
499																			-5.00		
500																			-5.00		
501																			38.10		
502																			62.20		
503																			88.30		
504		46.10	2.14	12.10	16.06	0.07	4.44	10.35	4.12	1.40	0.18			2.48	99.30			2			
505		47.90	1.66	12.80	14.81	0.08	5.69	8.65	3.42	1.79	0.13			2.07	99.00			1			
506		47.60	1.53	13.30	15.57	0.19	6.17	9.64	2.78	1.61	0.10	0.01		0.97	99.40			2			
507		46.40	1.88	12.80	16.71	0.17	6.12	8.99	2.88	1.94	0.08	0.01		1.29	99.30			2			
508		47.50	2.22	11.70	15.53	0.06	4.14	11.63	4.00	1.17	0.21		0.09	1.94	100.00			2			
509		46.30	2.09	11.90	18.11	0.12	7.36	4.83	3.31	2.53	0.11	0.04	0.35	1.11	98.20			1			
510		49.50	1.22	12.40	11.11	0.09	7.08	9.81	3.63	2.12	0.06			2.30	99.30			1			
511		41.40	1.49	16.60	16.67	0.07	7.20	3.89	3.64	4.00	0.06	0.05	0.40	0.87	96.30			1			
512		47.80	1.10	14.80	12.81	0.14	7.06	11.04	2.41	1.27	0.06	0.01		0.95	99.40			4			
513		48.72	1.49	14.22	15.35	0.29	6.20	9.90	1.46	0.87	0.11	0.01		0.84	99.46			32			
514		48.11	1.48	14.24	14.78	0.33	6.32	9.11	2.16	1.63	0.11	0.02		1.05	99.33			40			
515		47.75	1.42	13.66	13.96	0.20	6.45	10.67	2.92	1.17	0.10	0.01		1.21	99.52			9			
516		47.76	1.47	14.11	14.95	0.25	6.18	10.04	2.45	0.92	0.11	0.02		0.87	99.12			15			
517		49.20	1.47	14.15	14.82	0.23	6.42	11.09	1.25	0.44	0.11	0.01		0.43	99.62			14			
518		49.48	1.17	14.70	13.78	0.20	5.68	7.86	5.14	0.48	0.08	0.02		0.35	98.92						
519		46.70	1.23	14.50	15.05	0.17	7.21	7.26	4.49	0.79	0.09	0.02		1.51	98.90						
520		47.80	1.23	14.30	15.53	0.24	6.39	8.22	4.85	0.73	0.10	0.02		0.47	99.70			0			
521		48.50	1.22	14.37	14.40	0.18	7.61	6.54	4.69	1.29	0.08		0.01	0.55	99.44			2			
522		47.60	1.62	13.30	13.23	0.06	5.70	10.14	5.08	0.94	0.16	0.02		1.02	98.80			4			
523		48.02	1.67	13.36	12.66	0.07	6.06	10.20	4.78	1.02	0.14		0.06	0.79	98.84			1			
524		49.79	1.74	13.68	8.94	0.07	5.80	11.80	4.62	1.40	0.16		0.01	1.64	99.63			1			
525		51.00	1.96	13.40	7.40	0.06	6.12	11.82	4.97	1.06	0.19		0.04	1.49	99.50			2			
526		52.32	1.94	13.49	5.09	0.07	5.78	13.03	4.95	1.26	0.17	0.00		1.76	99.86			1			
527		47.17	1.74	12.99	13.48	0.08	5.59	10.28	4.70	1.49	0.16			1.27	98.95			1			
528		52.94	1.93	13.60	4.75	0.06	5.74	12.41	5.27	1.09	0.17		0.00	1.21	99.15			1			
529		52.35	1.96	13.84	4.85	0.06	5.89	12.21	5.17	1.28	0.17			2.02	99.79			2			
530		54.37	1.99	13.97	3.96	0.04	5.95	10.73	5.81	0.73	0.17		0.06	1.25	99.04			1			
531		47.89	1.66	12.80	14.81	0.08	5.69	8.65	3.43	1.79	0.13			2.07	98.99			1			

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
532		47.64	1.53	13.27	15.57	0.19	6.17	9.64	2.78	1.61	0.10	0.01		0.97	99.47			2			
533		46.40	1.88	12.84	16.71	0.17	6.12	8.99	2.88	1.94	0.09	0.01		1.29	99.30			2			
534		47.40	1.18	13.40	13.13	0.09	6.27	8.74	4.78	1.72	0.09	0.03		1.67	98.60			0			
535		46.90	1.65	12.70	14.42	0.11	5.89	9.62	3.43	1.98	0.11		0.00	3.15	99.90			2			
536		53.30	1.86	13.20	4.79	0.07	5.30	13.29	4.92	1.07	0.11			2.26	100.10			1			
537		49.33	2.31	12.55	19.58	0.26	3.60	6.04	3.74	1.52	0.20			0.25	99.40			5		237	
538		49.12	1.59	13.33	16.54	0.26	5.41	7.51	3.86	0.77	0.14			0.93	99.50			11		28	
539		49.18	2.03	12.15	18.42	0.21	4.84	6.51	2.78	1.99	0.16			0.83	99.06			5		310	
540		49.41	1.84	12.78	17.44	0.33	5.01	7.26	3.82	0.69	0.14			1.09	99.82			5		67	
541		48.60	1.55	13.30	14.42	0.18	6.70	9.84	4.23	0.41	0.13			0.81	100.20			3		204	
542		48.90	2.72	12.70	19.30	0.28	4.04	7.04	3.85	0.57	0.29	0.02		-0.06	99.60					102	
543		49.50	1.58	13.60	14.10	0.18	6.51	8.55	9.18	0.41	0.14	0.01		0.69	100.10					44	
544		49.70	1.21	14.60	14.30	0.26	6.72	10.34	2.15	0.83	0.10	0.01		0.82	101.10			2		87	
545		51.30	2.52	13.10	17.10	0.30	3.74	7.19	3.94	0.48	0.31			-0.29	99.70					98	
546																		1.06			
547																		4.27			
548																					
549																		5.06		168	
550																					
551		47.31	1.67	12.50	16.57	0.14	5.72	8.85	4.49	0.21	0.06			2.17	99.69			1		127	
552		56.39	1.52	15.28	4.40	0.05	2.01	9.84	6.64	0.02	0.02			3.07	99.24			1		-100	
553		45.61	1.60	14.08	11.17	0.01	4.14	19.93	1.83	0.01	0.03			2.16	100.68			2		-100	
554		46.90	1.69	13.23	16.17	0.18	6.45	8.30	3.76	1.06	0.07			2.30	100.13			1		-100	
555		52.89	2.01	11.94	5.12	0.10	4.77	14.05	3.75	1.31	0.02			3.10	99.06			1		112	
556		49.05	1.20	14.89	12.18	0.14	5.44	10.22	3.96	0.57	0.11			1.05	98.78			1		-100	
557		48.59	1.42	13.97	12.92	0.12	6.27	10.13	4.84	0.75	0.06			1.92	101.01			1		120	
558		50.45	1.13	15.90	10.84	0.13	6.55	1036.00	3.25	1.11	0.09			1.82	101.62			1		200	
559		49.23	1.59	12.32	14.04	0.14	6.18	11.25	2.94	1.25	0.09			1.70	100.74			1		137	
560		54.01	1.49	14.12	10.14	0.13	5.49	7.74	2.57	4.68	0.13			1.83	102.33			3		1450	
561		48.70	1.49	14.20	15.35	0.29	6.20	9.90	1.46	0.87	0.11			0.84	99.41			32			
562		47.50	2.22	11.70	15.53	0.06	4.14	11.63	4.00	1.17	0.21		0.09	1.94	100.19			-3			
563		49.54	0.36	13.95	9.59	0.14	11.25	9.60	2.68	0.50	0.03	0.01		2.08	99.73			1			
564		43.22	0.54	15.99	17.67	0.17	8.68	7.69	3.01	0.68	0.04	0.06		2.98	100.73			2			
565		51.15	1.32	14.85	13.14	0.23	6.32	11.22	1.82	0.94	0.13									190	
566		50.25	1.35	14.83	13.80	0.25	7.09	10.47	2.40	0.68	0.13									129	
567		51.21	1.10	14.24	13.47	0.22	6.75	10.85	2.51	0.66	0.11									426	
568		51.32	1.49	13.71	14.83	0.19	5.97	9.04	3.07	1.29	0.16									325	
569		49.56	2.70	12.89	17.81	0.15	4.79	8.69	3.24	1.06	0.31									170	
570		50.41	2.42	13.33	14.91	0.10	5.46	8.68	4.49	0.79	0.30									72	
571		50.18	1.36	16.23	11.97	0.14	6.14	10.99	2.99	0.80	0.13									97	
572		52.80	2.05	13.61	12.64	0.14	6.14	8.26	4.11	0.98	0.20									90	
573		50.90	1.75	13.37	16.59	0.22	5.68	9.44	2.39	0.81	0.19									272	
574		51.09	1.55	13.98	11.92	0.19	6.27	11.53	3.43	0.85	0.14									288	
575		53.96	0.83	14.43	10.78	0.15	6.65	9.42	2.37	2.14	0.14									333	
576		50.25	2.79	13.76	13.96	0.14	5.15	10.81	3.16	0.75	0.34									109	
577		49.20	1.04	15.05	13.79	0.20	9.42	9.81	2.13	0.50	0.08									139	
578		49.33	1.43	15.89	14.03	0.18	6.35	10.51	2.85	0.33	0.11									211	
579		49.06	0.87	15.43	12.10	0.19	8.13	13.33	1.63	0.22	0.06									49	
580		49.88	0.90	14.72	12.98	0.20	7.64	12.34	1.61	0.81	0.08									96	
581		50.08	0.91	16.23	12.08	0.19	6.83	10.98	2.78	0.95	0.07									130	
582		49.59	1.27	14.31	14.38	0.23	7.44	10.85	2.61	0.48	0.01									79	
583		50.43	1.77	14.42	16.01	0.19	4.76	9.76	3.06	0.68	0.17									158	
584		54.25	1.89	11.58	16.42	0.28	3.31	8.67	4.08	0.39	0.49									82	
585		50.39	1.66	13.27	16.81	0.20	5.80	9.83	2.87	0.36	0.14									273	
586		49.49	1.65	13.88	15.46	0.21	6.12	10.47	3.54	0.44	0.15									82	
587		46.43	2.09	12.33	20.21	0.17	6.24	9.77	2.18	0.78	0.09									116	
588		50.71	1.33	14.70	14.30	0.12	6.14	10.00	2.85	0.79	0.12									198	
589		53.67	1.09	16.05	10.74	1.14	5.31	8.60	2.70	2.31	0.15									481	
590		49.30	2.66	14.20	16.68	0.24	4.74	10.02	2.15	0.86	0.40									265	

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
591		51.23	0.48	15.20	10.20	0.16	11.74	9.60	1.19	1.08	0.06									173	
592		48.80	2.69	12.84	17.65	0.25	5.99	10.01	2.00	0.72	0.36									228	
593		48.92	2.60	13.33	16.90	0.24	5.83	9.99	2.37	0.75	0.39									189	
594		50.67	1.24	14.36	12.56	0.18	7.34	10.70	2.20	1.61	0.10									111	
595		51.05	1.90	14.21	12.19	0.18	7.84	11.29	1.98	0.93	0.10									188	
596		51.05	1.26	14.51	12.61	0.19	7.18	10.53	2.00	1.50	0.11									156	
597		50.88	1.21	14.37	12.56	0.19	7.42	10.43	1.82	1.98	0.11									427	
598		51.78	1.82	13.87	12.75	0.20	6.89	9.11	2.34	1.99	0.17									497	
599		51.27	1.80	13.74	12.79	0.19	7.20	10.24	2.10	1.45	0.16									215	
600		51.34	3.50	13.60	16.26	0.20	4.39	6.74	2.76	1.95	0.35									387	
601		48.11	1.36	13.03	13.33	0.08	6.40	9.00	4.11	1.15	0.18				96.98					58	
602		44.71	2.26	12.05	19.36	0.21	5.54	9.19	3.05	0.72	0.12				97.34					256	
603		47.5	2.02	11.7	17.47	0.2	7.35	11.25	2.22	0.41	0.09							4			
604		48.1	1.89	12.7	16.69	0.2	6.87	11.23	2.36	0.41	0.09							3			
605		48.8	0.52	17.9	7.38	0.11	8.08	10.65	2.62	0.42	0.07							1			
606		49.59	1.55	13.19	16.03	0.25	5.84	8.59	0.72	1.20	0.10			2.43	99.49			1			
607		47.24	1.63	12.90	14.84	0.11	6.72	11.10	3.15	0.99	0.11			1.39	100.18			1			
608		49.38	1.42	14.24	12.97	0.16	5.53	10.67	4.01	0.71	0.18			1.03	100.30			1			
609		48.43	1.78	14.07	15.67	0.11	5.60	8.83	3.98	0.87	0.15			1.90	101.39			2			
610		48.02	1.24	13.57	13.06	0.16	6.14	9.44	3.90	1.06	0.09			1.74	98.42			3			
611		48.90	1.79	12.53	15.50	0.16	5.76	8.71	2.43	0.85	0.14			1.50	98.27			1			
612		48.47	1.33	13.49	14.06	0.16	5.36	9.76	3.16	0.85	0.10			1.07	97.81			1			
613		48.69	1.19	14.47	12.35	0.15	6.37	11.18	3.48	0.84	0.07			0.72	99.51			1			
614		54.87	2.20	13.08	6.58	0.06	7.06	8.08	5.34	0.43	0.08			1.64	99.42			1			
615		52.16	1.56	14.03	12.96	0.15	4.35	9.97	2.62	1.48	0.11			1.89	101.28			2			
616		61.97	0.61	14.28	5.28	0.03	3.27	4.13	4.24	4.75	0.13			1.11	99.80			1		142	
617		60.70	0.60	12.73	4.27	0.05	4.71	9.10	6.96	0.18	0.09			0.95	100.34						
618		54.94	1.40	13.72	8.82	0.08	7.77	7.87	4.41	1.45	0.05			2.39	102.90			1			
619		47.23	1.15	13.14	12.31	0.07	7.36	10.60	4.66	0.72	0.05			1.19	98.48			2			
620		55.55	0.51	16.54	5.26	0.04	5.24	9.04	7.22	0.70	0.06			2.36	102.52			1			
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787	LOI	REST	TOTAL	AG	ARS	AU	B	BA	BE	BI	CD	CE	CL	CO	CR	CS	CU	DY	ER	EU	F
788	2.8	0.18	99.93	0.5	6.5	0	0	495	3	-2	0	93	0	24	116	-3	23	0	0	0	0
789	4.16	-0.15	97.36	-0.5	6.5	0	0	1118	2.5	-2	0	91	0	14	73	5	45	0	0	0	0
790	7.28	0.11	99.42	-0.5	9.5	0	0	539	3	-2	0	97	0	16	60	-3	57	0	0	0	0
791	9.68	0.15	100.26	-0.5	23.5	0	0	168	0.5	-2	0	25	0	44	101	3	71	0	0	0	0
792	2.74	0.16	100.23	-0.5	7.5	0	0	284	1	-2	0	50	0	13	178	-3	36	0	0	0	0
793	0.95	0.19	99.54	2	-0.5	0	0	593	5	-2	0	114	0	6	11	-3	22	0	0	0	0
794	5.24	0	100.13	0	2	0	0	4	3	-1	0	43	0	35	48	-5	-1	0	0	0	0
795	0	0	99.61	0	-1	0	0	637	0	0	0	186	0	0	7	0	20	0	0	0	1600
796	4.08	0.2	100.06	0.5	70.5	0	0	450	2.5	-2	0	91	0	46	173	-3	103	0	0	0	0
797	1.85	0.17	100.07	-0.5	4.5	0	0	406	2	-2	0	79	0	10	112	4	14	0	0	0	0
798	4.03	0.22	99.83	-0.5	15	0	0	587	2.5	-2	0	113	0	9	72	3	88	0	0	0	0
799	8.17	-0.22	97.11	-0.5	10	0	0	468	2.5	-2	0	112	0	18	69	4	93	0	0	0	0
800	8.88	0.15	99.87	-0.5	21	0	0	18	1	-2	0	30	0	41	136	-3	33	0	0	0	0
801	4.03	0.25	99.54	-0.5	194.5	0	0	544	3	-2	0	90	0	19	132	4	211	0	0	0	0
802	2.47	0.13	100.01	-0.5	4.5	0	0	263	2.5	-2	0	82	0	15	92	-3	39	0	0	0	0
803	0.81	0.11	99.97	-1	0	0	0	271	1	-2	0	52	0	7	-1	-3	17	0	0	0	0
804	0.81	0.29	99.91	2	2	1.18	0	1539	1	-2	0	83	0	0	4	6	0	0	0	0	0
805	0.87	0.17	99.9	1	-0.5	0	0	580	2	-2	0	64	0	0	3	-5	0	0	0	0	0
806	0.59	0.18	100.06	1	1	-1	0	507	2	-2	0	106	0	0	5	0	17	0	0	0	0
807	1.35	0	99.85	0	0.5	2.65	0	1295	4	-2	0	302	1025	9	4	14	11	0	0	0	800
808	0.84	0	99.97	0	1.5	1.65	0	1665	-1	-2	0	107	300	3	4	0	3	0	0	0	300
809	0.89	0	99.24	0	1	0	0	657	6	-2	0	97	634	5	2	6	7	0	0	0	700
810	1.77	0	99.92	0	2.5	0	0	11	2	-2	0	22	499	49	134	-4	131	0	0	0	-200
811	5.55	0	99.98	0	15	11.2	0	17	-1	-2	0	59	315	46	17	-5	4	0	0	0	-200
812	0.86	0	99.7	0	0.5	0	0	490	5	-2	0	120	346	6	4	0	7	0	0	0	700
813	1.34	0	99.11	0	1	0	0	670	6	-2	0	137	540	13	35	10	7	0	0	0	800
814	0	0	99.51	0	0.5	3.78	0	880	2	-2	0	141	362	8	2	0	9	0	0	0	900
815	0	0	99.77	0	1	0	0	1040	0	0	0	151	0	5	11	0	10	0	0	0	0
816	0	0	99.87	0	0	0	0	50	0	0	0	15	0	0	309	0	158	0	0	0	0
817	0	0	99.47	0	0	0	0	470	0	0	0	160	0	0	10	0	16	0	0	0	0
818	0	0	99.76	0	-1	0	0	156	0	0	0	68	0	0	13	0	5	0	0	0	0
819	0	0	99.27	0	-0.5	-1	0	259	6	-2	0	53	192	4	5	0	67	0	0	0	400
820	0	0	92.77	0	0	0	0	640	0	0	0	0	0	-8	60	0	26	0	0	0	0
821	0	0	99.54	0	0	0	0	80	0	0	0	40	0	0	7	0	33	0	0	0	200
822	0	0	99.11	0	1	0	0	24	0	0	0	180	0	0	14	0	5	0	0	0	0
823	0	0	99.77	0	1	0	0	777	0	0	0	128	0	0	10	0	7	0	0	0	0
824	8.63	0.08	99.18	-0.5	5.5	0	0	179	2	-2	0	51	0	41	208	-3	74	0	0	0	0
825	5.03	0.21	99.74	-0.5	17.5	0	0	558	4	-2	0	126	0	18	134	-3	29	0	0	0	0

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
826	3.89	0.18	99.87	-0.5	18	0	0	427	4	-2	0	82	0	14	133	-3	13	0	0	0	0
827	2.9	0.13	99.84	-0.5	1.5	0	0	429	2.5	-2	0	64	0	7	143	-3	28	0	0	0	0
828	0.87	0.24	99.81	-1	0	0	0	694	3	-2	0	180	0	8	3	-3	53	0	0	0	0
829	1.25	0.14	99.89	1	-0.5	-1	0	288	4	-2	0	76	0	0	3	6	5	0	0	0	0
830	0	0	99.32	0	0	0	0	100	0	0	0	20	0	0	0	0	100	0	0	0	0
831	0	0	100	0	1	0	0	382	0	0	0	52	0	0	33	0	12	0	0	0	200
832	8.87	0.21	100.15	-0.5	12	0	0	214	1	-2	0	36	0	43	160	3	110	0	0	0	0
833	3.52	0.19	99.98	-0.5	4.5	0	0	482	3.5	-2	0	93	0	11	137	9	5	0	0	0	0
834	2.76	0.13	100.13	-0.5	12	0	0	214	2	-2	0	76	0	11	136	6	11	0	0	0	0
835	3.64	0.09	99.93	-0.5	1.5	0	0	162	1.5	-2	0	98	0	10	90	-3	16	0	0	0	0
836	2.34	0.21	100.11	-0.5	6	0	0	655	1.5	-2	0	72	0	19	124	-3	87	0	0	0	0
837	4.4	0.17	100.14	-0.5	6	0	0	430	3	-2	0	108	0	17	145	3	66	0	0	0	0
838	3	0.14	100.06	-0.5	8.5	0	0	213	2.5	-2	0	70	0	9	162	6	19	0	0	0	0
839	2.25	0.1	99.91	-0.5	3.5	0	0	157	1.5	-2	0	60	0	4	137	-3	15	0	0	0	0
840	1.33	0.3	100.27	2	2.5	0	0	1345	3	-2	0	63	0	0	20	-3	31	0	0	0	0
841	0.48	0.2	99.9	1	-0.5	0	0	1108	2	-2	0	17	0	0	19	-3	6	0	0	0	0
842	2.87	0.55	100.02	2	37.5	0	0	3301	2	-2	0	38	0	0	65	-3	80	0	0	0	0
843	2.1	0	99.81	0	7	0	0	391	3	2	0	64	143	9	44	-5	45	0	0	0	400
844	1.04	0	99.01	0	0.5	0	0	909	5	-2	0	93	647	5	4	-6	5	0	0	0	500
845	0.68	0	99.21	0	1	1.52	0	302	10	-2	0	89	370	2	6	-6	3	0	0	0	200
846	2.62	0	99.47	0	0.5	0	0	709	4	2	0	145	2071	41	143	8	55	0	0	0	1100
847	0.89	0	100.04	0	1.5	0	0	43	11	-2	0	107	448	8	49	0	4	0	0	0	1000
848	1.19	0	99.84	0	0.5	2.99	0	1362	4	-2	0	157	267	6	-2	0	17	0	0	0	0
849	3.23	0	99.98	0	1	0	0	95	1	2	0	13	363	43	203	-3	94	0	0	0	-200
850	1.14	0	100.13	0	2	0	0	641	-1	-2	0	52	73	4	35	-5	-2	0	0	0	500
851	1.02	0	99.44	0	1	0	0	614	3	-2	0	42	330	3	-2	-4	13	0	0	0	-200
852	0.8	0	99.53	0	0.5	1.17	0	663	4	-2	0	133	826	5	-2	8	9	0	0	0	500
853	0	0	99.35	0	0	0	0	280	0	0	0	0	0	41	13	0	36	0	0	0	0
854	0	0	99.29	0	0	0	0	1150	0	0	0	0	0	27	120	0	27	0	0	0	0
855	0	0	99.56	0	0.5	2.58	0	405	5	-2	0	108	183	4	2	0	9	0	0	0	700
856	0	0	99.05	0	0	0	0	100	0	0	0	0	0	62	87	0	130	0	0	0	0
857	0	0	101.07	0	0	0	0	185	0	0	0	0	0	35	11	0	20	0	0	0	0
858	0	0	99.13	0	0	0	0	410	0	0	0	60	0	0	36	0	42	0	0	0	0
859	0	0	101.24	0	0	0	0	410	0	0	0	0	0	54	35	0	130	0	0	0	0
860	0	0	99.32	0	0	0	0	1100	0	0	0	60	0	0	22	0	13	0	0	0	0
861	0	0	99.74	0	-1	0	0	778	0	0	0	91	0	0	3	0	12	0	0	0	0
862	3.11	0.19	100.2	-0.5	32	0	0	377	2	-2	0	100	0	16	173	5	63	0	0	0	0
863	3.62	0.22	100.09	-0.5	6.5	0	0	434	3	-2	0	124	0	16	137	6	48	0	0	0	0
864	3.59	0.2	100.18	-0.5	48.5	0	0	429	4	-2	0	127	0	16	63	4	83	0	0	0	0
865	10.46	0.19	99.49	-0.5	24.5	0	0	346	1.5	-2	0	42	0	47	127	5	171	0	0	0	0
866	2.98	0.22	100.05	-0.5	27	0	0	748	3.5	-2	0	91	0	14	76	-3	52	0	0	0	0
867	0.9	0.16	99.88	-1	0	0	0	698	-1	-2	0	25	0	7	3	-3	8	0	0	0	0
868	1.84	0	99.29	0	0.5	0	0	68	-1	-1	0	19	0	0	25	-4	66	0	0	0	0
869	0	0	99.62	0	1	0	0	991	0	0	0	111	0	10	18	0	20	0	0	0	0
870	3.64	0.2	100.18	-0.5	10.5	0	0	461	3	-2	0	84	0	11	130	7	73	0	0	0	0
871	5.23	0.2	99.9	-0.5	1	0	0	195	0.5	-2	0	39	0	37	218	-3	70	0	0	0	0
872	3.65	0.18	100.06	-0.5	16	0	0	309	2.5	-2	0	94	0	12	165	4	33	0	0	0	0
873	3.79	0.25	99.78	-0.5	5.5	0	0	990	3.5	-2	0	98	0	9	102	7	30	0	0	0	0
874	2.37	0.16	100.18	-0.5	6	0	0	547	1.5	-2	0	46	0	9	109	-3	50	0	0	0	0
875	3.1	0.22	100.04	-0.5	11	0	0	774	3	-2	0	89	0	9	115	-3	17	0	0	0	0
876	12.31	0.2	100.07	-0.5	18	0	0	149	1	-2	0	44	0	46	134	3	281	0	0	0	0
877	3.51	0.15	100.08	-0.5	11.5	0	0	365	3	-2	0	87	0	13	149	4	35	0	0	0	0
878	1.68	0.16	99.87	-1	0	0	0	108	2	-2	0	104	0	8	5	-3	18	0	0	0	0
879	2.33	1.94	99.47	9	86	0	0	13678	6	-2	0	55	0	0	27	-3	188	0	0	0	0
880	1.12	0	99.47	0	2	0	0	108	4	-2	0	132	413	6	10	0	11	0	0	0	-200
881	0.86	0	99.51	0	-0.5	0	0	139	3	-2	0	49	441	4	3	-5	3	0	0	0	600
882	0.81	0	99.94	0	0.5	1.24	0	771	5	-2	0	250	680	6	2	0	5	0	0	0	900
883	0.88	0	99.7	0	1.5	1.45	0	620	7	-2	0	124	279	5	4	0	9	0	0	0	1600
884	0.77	0	99.38	0	1.5	1.43	0	1462	3	-2	0	150	635	6	2	8	7	0	0	0	-200

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
885	10.89	0	100	0	14	0	0	49	-1	-2	0	15	829	33	52	-4	109	0	0	0	400
886	1.58	0	99.74	0	5	0	0	230	2	-2	0	20	187	47	33	-4	10	0	0	0	-200
887	0.58	0	99.2	0	1	0	0	28	-1	-2	0	8	200	2	4	-3	2	0	0	0	-200
888	1.1	0	99.39	0	2	1.61	0	981	4	-2	0	151	647	8	6	0	10	0	0	0	1200
889	2.4	0	99.07	0	0.5	0	0	349	1	1	0	21	0	0	76	-4	29	0	0	0	0
890	0	0	100.35	0	0.5	3.45	0	509	3	-2	0	109	191	10	-2	0	93	0	0	0	400
891	0	0	99.59	0	0	0	0	65	0	0	0	75	0	0	0	0	50	0	0	0	0
892	0	0	99.42	0	1	0	0	158	0	0	0	70	0	0	6	0	4	0	0	0	1600
893	0	0	99.35	0	0	0	0	140	0	0	0	20	0	0	0	0	5	0	0	0	0
894	0	0	98.79	0	4	0	0	387	0	0	0	76	487	0	65	0	360	0	0	0	0
895	0	0	99.47	0	0	0	0	80	0	0	0	-10	0	0	0	0	28	0	0	0	0
896	0	0	100	0	0	0	0	210	0	0	0	0	0	48	120	0	50	0	0	0	0
897	0	0	99.13	0	0	0	0	88	0	0	0	0	0	41	13	0	31	0	0	0	0
898	0	0	99.82	0	2	0	0	120	0	0	0	63	0	-5	5	0	6	0	0	0	0
899	1.7	0.13	99.73	-0.5	6	0	0	148	2	-2	0	68	0	10	108	-3	18	0	0	0	0
900	6.53	0.17	99.76	-0.5	1	0	0	148	-0.5	-2	0	9	0	50	161	-3	146	0	0	0	0
901	6.68	0.2	100.09	-0.5	4.5	0	0	199	1	-2	0	24	0	41	162	3	172	0	0	0	0
902	4.09	0.18	99.98	-0.5	7.5	0	0	508	3	-2	0	65	0	14	137	5	12	0	0	0	0
903	3.33	0.3	99.97	-0.5	28	0	0	798	4	-2	0	111	0	15	167	-3	128	0	0	0	0
904	1.25	0	99.01	0	1.5	1.98	0	1501	4	2	0	197	1031	9	3	10	20	0	0	0	1700
905	0	0	99.26	0	1	0	0	179	0	0	0	47	0	-5	7	0	7	0	0	0	0
906	1.96	0.17	100.15	-0.5	4	0	0	453	1.5	-2	0	77	0	8	77	4	7	0	0	0	0
907	4.57	0.2	100.03	-0.5	10.5	0	0	454	3	-2	0	112	0	14	131	7	17	0	0	0	0
908	4.41	0.19	100.17	-0.5	9.5	0	0	543	2	-2	0	97	0	13	72	3	32	0	0	0	0
909	3.57	0.19	100.14	-0.5	55.5	0	0	434	3	-2	0	96	0	55	107	5	54	0	0	0	0
910	4.24	0.34	100.33	-0.5	2	0	0	505	2	2	0	40	0	69	115	13	663	0	0	0	0
911	1.96	0.12	100	-0.5	11.5	0	0	167	1.5	-2	0	64	0	15	139	3	35	0	0	0	0
912	15.09	0.24	100.08	-0.5	10	0	0	386	2	-2	0	30	0	53	231	16	42	0	0	0	0
913	8.66	0.2	100.04	-0.5	9	0	0	220	1	-2	0	46	0	80	88	8	131	0	0	0	0
914	4.98	0.03	98.71	-0.5	4.5	0	0	684	2	-2	0	83	0	12	113	-3	29	0	0	0	0
915	2.59	0.21	100.1	-0.5	61	0	0	564	3	-2	0	158	0	26	85	-3	32	0	0	0	0
916	5.17	0.2	100.09	-0.5	9	0	0	215	1	2	0	34	0	34	139	-3	31	0	0	0	0
917	2.55	0.2	99.88	-0.5	8	0	0	626	2.5	-2	0	76	0	4	134	-3	154	0	0	0	0
918	3.52	0.21	99.93	-0.5	2.5	0	0	324	1	-2	0	67	0	42	98	-3	120	0	0	0	0
919	1.87	0.37	99.9	-1	0	0	0	1050	1	-2	0	104	0	18	26	-3	21	0	0	0	0
920	0.27	0.04	99.97	1	1	0	0	0	1	-2	0	0	0	0	0	0	1	0	0	0	0
921	0.58	0.07	99.96	1	1	0	0	117	1	-2	0	38	0	0	15	5	7	0	0	0	0
922	0.73	0	99.41	0	1	0	0	1279	2	-2	0	56	185	7	54	9	26	0	0	0	300
923	0.53	0	99.89	0	0.5	0	0	112	3	-2	0	56	133	9	6	-5	2	0	0	0	400
924	1.49	0	99.74	0	3	3.14	0	94	1	-2	0	42	176	8	29	-4	7	0	0	0	200
925	3.38	0	99.69	0	6	0	0	305	3	-2	0	103	93	3	60	0	16	0	0	0	1000
926	1.92	0	100.09	0	2	0	0	21	-1	-2	0	4	383	51	263	-3	150	0	0	0	-200
927	0.88	0	99.47	0	2.5	0	0	420	4	-2	0	197	323	13	4	0	28	0	0	0	900
928	0.58	0	100.2	0	2	0	0	1136	3	2	0	120	270	16	11	9	14	0	0	0	-200
929	1.77	0	100.02	0	1	0	0	83	-1	-2	0	8	858	52	406	4	54	0	0	0	-200
930	1.88	0	99.98	0	1	0	0	88	2	-2	0	43	1199	19	-2	-5	7	0	0	0	400
931	1.49	0	99.12	0	1.5	8.14	0	1566	3	-2	0	155	1031	11	8	9	9	0	0	0	1300
932	0.86	0	99.72	0	0.5	1.31	0	333	7	-2	0	102	386	4	6	0	5	0	0	0	600
933	0.8	0	99.14	0	0.5	0	0	1361	3	-2	0	21	240	3	-2	-4	13	0	0	0	200
934	1.16	0	99.67	0	1	0	0	708	6	-2	0	116	651	10	24	8	32	0	0	0	700
935	0	0	99.82	0	0.5	0	0	855	3	-2	0	188	332	5	2	0	2	0	0	0	800
936	0	0	99.4	0	1	0	0	716	0	0	0	146	0	0	11	0	35	0	0	0	0
937	0	0	99.76	0	0	0	0	180	0	0	0	55	0	0	35	0	8	0	0	0	0
938	0	0	99.46	0	1	0	0	692	0	0	0	103	0	5	8	0	11	0	0	0	0
939	0	0	99.74	0	0	0	0	660	0	0	0	140	0	0	11	0	32	0	0	0	0
940	0	0	98.85	0	0	0	0	92	0	0	0	0	0	58	100	0	15	0	0	0	0
941	0	0	100.03	0	-1	0	0	481	0	0	0	142	0	0	6	0	7	0	0	0	0
942	0	0	99.32	0	0	0	0	1550	0	0	0	45	0	0	0	0	10	0	0	0	0
943	1.85	0.14	100.05	-0.5	12	0	0	231	2	-2	0	82	0	12	133	6	24	0	0	0	0

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
944	5.26	0.2	99.86	-0.5	6.5	0	0	645	3	2	0	88	0	9	105	-3	25	0	0	0	0
945	11.85	0.2	99.95	-0.5	6.5	0	0	164	1	-2	0	53	0	29	56	5	137	0	0	0	0
946	2.25	0.2	99.79	-0.5	9	0	0	802	3.5	-2	0	103	0	5	60	-3	12	0	0	0	0
947	0	0	100.06	0	1	0	0	289	0	0	0	60	0	8	10	0	8	0	0	0	0
948	3.58	0.24	100.04	-0.5	12.5	0	0	667	3	-2	0	132	0	14	142	7	9	0	0	0	0
949	4.62	0.24	99.96	-0.5	21	0	0	823	3	-2	0	87	0	15	126	-3	24	0	0	0	0
950	3.44	0.16	100.02	-0.5	10.5	0	0	395	2.5	-2	0	77	0	10	115	-3	16	0	0	0	0
951	12.3	0.17	99.71	1	10	0	0	45	-0.5	-2	0	24	0	48	110	-3	137	0	0	0	0
952	6.1	0.21	100.03	-0.5	26	0	0	784	2	-2	0	70	0	17	70	3	18	0	0	0	0
953	4.23	0.08	99.23	-0.5	19	0	0	363	1.5	-2	0	76	0	16	177	-3	29	0	0	0	0
954	1.22	0.08	99.97	-0.5	29.5	0	0	107	1	-2	0	24	0	21	174	-3	52	0	0	0	0
955	9.74	0.2	99.83	-0.5	1	0	0	143	0.5	-2	0	21	0	41	172	4	78	0	0	0	0
956	0.9	0.2	99.89	-1	0	0	0	529	2	-2	0	113	0	8	11	-3	22	0	0	0	0
957	0.77	0.25	99.71	-1	0	0	0	1035	2	-2	0	83	0	6	1	-3	10	0	0	0	0
958	1.06	0.26	100.06	-1	0	0	0	530	3	-2	0	166	0	8	7	-3	6	0	0	0	0
959	0.46	0.1	99.88	1	-0.5	0	0	40	2	-2	0	111	0	0	21	4	2	0	0	0	0
960	3.09	0	99.52	0	4	0	0	29	2	-2	0	19	362	48	45	-4	105	0	0	0	400
961	1.86	0	99.85	0	0.5	0	0	22	2	-1	0	24	3031	0	40	-4	4	0	0	0	0
962	1.24	0	99.92	0	1	-1	0	718	4	-2	0	164	644	11	5	0	25	0	0	0	1400
963	1	0	99.65	0	1	0	0	416	3	-2	0	59	550	4	2	5	6	0	0	0	-200
964	0.81	0	100	0	1	0	0	131	2	-2	0	49	259	10	40	5	6	0	0	0	300
965	0.55	0	99.92	0	2	0	0	30	-1	-2	0	15	203	4	3	-4	11	0	0	0	-200
966	1	0	99.62	0	-0.5	0	0	690	1	1	0	11	224	0	23	-3	5	0	0	0	0
967	1.92	0	99.99	0	1	0	0	55	2	-2	0	34	1420	39	-2	5	6	0	0	0	400
968	1	0	99.53	0	1.5	1.62	0	301	8	-2	0	149	532	5	2	0	6	0	0	0	300
969	0.61	0	99.89	0	2	0	0	104	2	-2	0	50	68	8	32	-5	3	0	0	0	300
970	0.84	0	99.33	0	0.5	1.72	0	253	1	-2	0	161	1031	4	-2	0	16	0	0	0	200
971	1.83	0	100.25	0	1.5	0	0	71	2	-2	0	16	881	52	110	-4	134	0	0	0	-200
972	1.41	0	100.08	0	2	0	0	42	1	1	0	60	2089	0	-2	-5	8	0	0	0	0
973	0	0	98.39	0	0	0	0	640	0	0	0	110	0	0	0	0	30	0	0	0	1100
974	0	0	99.7	0	0	0	0	85	0	0	0	25	0	0	0	0	2	0	0	0	0
975	0	0	99.56	0	0.5	0	0	136	4	-2	0	136	3483	5	3	0	10	0	0	0	300
976	0	0	99.87	0	0	0	0	150	0	0	0	75	0	0	0	0	22	0	0	0	0
977	0	0	99.66	0	-1	0	0	614	0	0	0	148	0	12	32	0	18	0	0	0	0
978	0	0	97.12	0	0	0	0	180	0	0	0	0	0	28	17	0	14	0	0	0	0
979	0	0	99.63	0	1	0	0	874	0	0	0	136	0	8	9	0	3	0	0	0	0
980	0	0	99.85	0	1.5	0	0	156	0	0	0	20	505	0	245	0	175	0	0	0	0
981	0	0	99.94	0	-1	0	0	1611	0	0	0	203	0	30	105	0	32	0	0	0	0
982	0	0	99.02	0	0	0	0	780	0	0	0	50	0	0	116	0	11	0	0	0	0
983	0	0	99.4	0	0	0	0	290	0	0	0	0	0	82	36	0	90	0	0	0	0
984	0	0	100.72	0	0.5	2.68	0	592	4	-2	0	130	519	9	-2	0	63	0	0	0	800
985	0	0	100.21	0	0.5	3.07	0	637	3	-2	0	191	235	9	2	0	28	0	0	0	500
986	0	0	99.29	0	-1	0	0	580	0	0	0	50	0	0	5	0	9	0	0	0	0
987	0	0	99.41	0	1.5	0	0	497	0	0	0	32	236	0	175	0	177	0	0	0	0
988	0	0	99.94	0	-1	0	0	583	0	0	0	42	0	0	6	0	4	0	0	0	0
989	4.64	0.19	99.86	-0.5	2	0	0	240	0.5	-2	0	27	0	40	130	-3	99	0	0	0	0
990	4.22	0.23	99.89	-0.5	1.5	0	0	876	3.5	-2	0	107	0	5	42	6	16	0	0	0	0
991	3.43	0.16	100.14	-0.5	6.5	0	0	310	2	-2	0	86	0	11	130	7	67	0	0	0	0
992	5	0.21	99.91	-0.5	15.5	0	0	190	1	-2	0	31	0	45	70	10	87	0	0	0	0
993	3.92	0.19	100.16	-0.5	29	0	0	122	0.5	-2	0	13	0	53	150	3	55	0	0	0	0
994	4.2	0.19	100.12	-0.5	11.5	0	0	518	2.5	-2	0	69	0	11	91	-3	48	0	0	0	0
995	3.14	0.18	100.19	-0.5	11.5	0	0	424	3.5	-2	0	87	0	15	149	5	43	0	0	0	0
996	2.66	0.16	99.96	-0.5	10	0	0	570	2	-2	0	60	0	12	97	-3	19	0	0	0	0
997	3.27	0.21	100.06	-0.5	9.5	0	0	657	3.5	-2	0	72	0	6	87	3	40	0	0	0	0
998	3.68	0.18	99.4	-0.5	1	0	0	91	-0.5	-2	0	18	0	49	165	-3	151	0	0	0	0
999	1.49	0.19	99.82	2	-0.5	0	0	154	3	-2	0	51	0	0	102	5	16	0	0	0	0
1000	1.65	0.09	99.58	1	1	1.57	0	30	4	-2	0	84	0	0	4	-6	2	0	0	0	0
1001	0.25	0	99.98	0	1	2.9	0	72	7	-2	0	83	118	2	-2	-6	4	0	0	0	-200
1002	0.67	0	99.46	0	1	0	0	324	4	-2	0	86	174	5	2	-6	6	0	0	0	400

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
1003	1.04	0	99.74	0	1.5	0	0	884	3	-2	0	245	944	10	8	13	11	0	0	0	1000
1004	1.11	0	99.96	0	0.5	0	0	657	4	-2	0	48	505	6	7	-5	2	0	0	0	600
1005	2.09	0	99.96	0	3.5	0	0	22	1	2	0	7	265	52	289	-3	107	0	0	0	-200
1006	0.86	0	99.72	0	0.5	0	0	725	3	-2	0	75	254	8	75	9	-2	0	0	0	600
1007	0.74	0	100.2	0	3.5	0	0	55	3	-2	0	50	45	11	46	-5	13	0	0	0	200
1008	2	0	100.04	0	1	0	0	54	3	6	0	21	1134	47	65	-4	17	0	0	0	-200
1009	13.2	0	80.91	0	20255	0	0	115	-1	10	0	56	327	140	-2	-5	0	0	0	0	600
1010	1.03	0	99.84	0	1.5	0	0	678	5	-2	0	157	540	7	5	0	11	0	0	0	1100
1011	0.58	0	100.39	0	1	0	0	2281	-1	-2	0	31	107	4	-2	-4	-2	0	0	0	-200
1012	1.21	0	100.01	0	0.5	1.6	0	366	6	-2	0	97	394	9	-2	0	7	0	0	0	0
1013	0	0	99.83	0	1	0	0	261	0	0	0	216	0	0	7	0	3	0	0	0	500
1014	0	0	99.54	0	-1	0	0	837	0	0	0	226	0	0	9	0	5	0	0	0	1300
1015	0	0	99.29	0	0	0	0	20	0	0	0	60	0	0	7	0	7	0	0	0	0
1016	0	0	99.74	0	0	0	0	90	0	0	0	0	0	40	39	0	29	0	0	0	0
1017	0	0	98.77	0	1.5	0	0	215	0	0	0	30	571	0	265	0	197	0	0	0	0
1018	0	0	99.42	0	0	0	0	15	0	0	0	90	0	0	58	0	11	0	0	0	0
1019	0	0	99.16	0	-1	0	0	1454	0	0	0	137	0	0	46	0	58	0	0	0	0
1020	0	0	100.16	0	0.5	2.75	0	840	5	-2	0	151	336	7	3	0	6	0	0	0	900
1021	0	0	99.36	0	0	0	0	200	0	0	0	20	0	0	0	0	5	0	0	0	0
1022	0	0	99.86	0	-1	0	0	294	0	0	0	21	0	0	13	0	4	0	0	0	0
1023	9.08	0.2	99.95	-0.5	46.5	0	0	63	0.5	2	0	24	0	52	246	-3	85	0	0	0	0
1024	6.57	0.22	100.16	-0.5	1.5	0	0	684	3	-2	0	95	0	11	102	10	48	0	0	0	0
1025	3.52	0.04	99.11	-0.5	3	0	0	203	1.5	-2	0	117	0	10	131	-3	27	0	0	0	0
1026	0.95	0.21	99.97	-0.5	3	0	0	921	2	-2	0	81	0	3	123	-3	20	0	0	0	0
1027	3.99	0.23	100.19	-0.5	9	0	0	843	4.5	-2	0	85	0	17	70	6	55	0	0	0	0
1028	0	0	99.64	0	0	0	0	700	0	0	0	50	0	0	0	0	5	0	0	0	0
1029	1.11	0	99.55	0	2	1.39	0	705	6	-2	0	317	304	7	-2	0	6	0	0	0	1700
1030	6.52	0.21	100.01	-0.5	1.5	0	0	280	3.5	2	0	68	0	33	89	13	153	0	0	0	0
1031	7.23	0.11	99.41	-0.5	5.5	0	0	303	1.5	-2	0	49	0	23	148	4	35	0	0	0	0
1032	6.21	0.13	99.55	-0.5	9.5	0	0	220	1	-2	0	44	0	34	152	-3	87	0	0	0	0
1033	2.16	0.21	99.98	-0.5	8.5	0	0	772	3.5	-2	0	110	0	5	60	3	13	0	0	0	0
1034	15.93	0.25	99.24	0.5	4	0	0	1226	1.5	-2	0	65	0	17	74	4	158	0	0	0	0
1035	2.65	0.22	100.07	-0.5	2.5	0	0	275	1	-2	0	27	0	46	169	-3	80	0	0	0	0
1036	7.81	0.21	99.93	-0.5	15	0	0	195	1.5	-2	0	65	0	37	136	5	171	0	0	0	0
1037	2.01	0.16	100.08	-0.5	7	0	0	304	2	-2	0	81	0	10	148	6	24	0	0	0	0
1038	0.34	0.15	99.78	1	13	0	0	586	1	-2	0	50	0	0	41	4	1	0	0	0	0
1039	0.39	0.17	99.86	1	-0.5	0	0	922	1	-2	0	71	0	0	9	-3	2	0	0	0	0
1040	0.98	0	100.24	0	1	3.4	0	2291	-1	-2	0	107	76	3	44	0	5	0	0	0	-200
1041	2.1	0	100.04	0	3.5	0	0	82	2	-2	0	12	2225	47	162	3	77	0	0	0	-200
1042	0.93	0	99.68	0	2	0	0	826	3	-2	0	90	475	11	15	-6	10	0	0	0	300
1043	0.85	0	99.26	0	1	0	0	167	3	-2	0	15	230	3	2	-4	7	0	0	0	500
1044	1.42	0	100.02	0	6	2.81	0	157	3	-1	0	6	529	0	-2	-3	120	0	0	0	0
1045	0.86	0	99.41	0	1.5	0	0	595	7	-2	0	219	326	4	-2	11	16	0	0	0	1700
1046	1.94	0	100	0	11	0	0	13	2	-2	0	30	2181	46	-2	4	8	0	0	0	300
1047	1.35	0	99.77	0	1.5	1.9	0	841	4	-2	0	169	780	16	29	9	36	0	0	0	1200
1048	0.79	0	100.01	0	1.5	0	0	57	12	-2	0	105	383	14	51	0	4	0	0	0	400
1049	1.11	0	100.07	0	1	1.62	0	570	4	-2	0	103	447	8	9	0	8	0	0	0	1300
1050	1.05	0	100.16	0	4	0	0	966	21	2	0	198	901	9	5	19	16	0	0	0	1200
1051	0.92	0	99.65	0	1	3.12	0	468	3	-2	0	194	311	7	-2	0	9	0	0	0	900
1052	2.52	0	100.14	0	3	1.47	0	353	3	-2	0	9	571	2	4	-3	5	0	0	0	600
1053	1.08	0	99.7	0	0.5	0	0	1201	5	-2	0	229	691	8	2	0	8	0	0	0	1000
1054	0	0	98.01	0	0	0	0	105	0	0	0	0	0	40	26	0	14	0	0	0	0
1055	0	0	99.52	0	0.5	2.3	0	189	3	-2	0	115	236	9	2	0	37	0	0	0	200
1056	0	0	99.41	0	0.5	2.22	0	665	3	-2	0	128	180	8	9	0	20	0	0	0	900
1057	0	0	97.26	0	550	0	0	120	0	0	0	0	0	57	170	0	14	0	0	0	0
1058	0	0	99.85	0	1	0	0	229	0	0	0	230	0	0	12	0	8	0	0	0	800
1059	0	0	99.23	0	1	0	0	370	0	0	0	170	0	0	14	0	23	0	0	0	0
1060	3.81	0.19	99.79	-0.5	12.5	0	0	498	3	-2	0	117	0	14	66	5	116	0	0	0	0
1061	4.31	0.26	99.84	-0.5	1	0	0	915	3.5	-2	0	109	0	12	64	9	70	0	0	0	0

	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
1062	3.3	0.23	100.12	-0.5	-0.5	0	0	119	0.5	-2	0	24	0	44	149	7	93	0	0	0	0
1063	0.74	0	100.05	0	1.5	1.49	0	133	5	-2	0	189	352	7	3	0	15	0	0	0	300
1064	2.6	0.18	99.68	-0.5	2	0	0	143	0.5	-2	0	19	0	53	126	-3	162	0	0	0	0
1065	2.95	0.17	99.93	-0.5	19	0	0	340	3.5	-2	0	107	0	16	156	10	27	0	0	0	0
1066	3.84	0.2	100.12	-0.5	9	0	0	688	3	-2	0	60	0	8	87	-3	59	0	0	0	0
1067	3.92	0.21	99.86	-0.5	4	0	0	245	0.5	-2	0	26	0	49	133	-3	102	0	0	0	0
1068	0.77	0.14	100.16	1	-0.5	0	0	432	2	-2	0	65	0	0	53	4	28	0	0	0	0
1069	0.46	0.06	99.81	1	12.5	0	0	24	1	-2	0	51	0	0	30	-3	10	0	0	0	0
1070	1.06	0.25	99.8	1	-0.5	0	0	771	3	-2	0	155	0	0	42	11	9	0	0	0	0
1071	0.93	0.38	100.06	2	1	-1	0	2177	1	-2	0	107	0	0	1	0	1	0	0	0	0
1072	0.64	0.28	100	1	2	1.09	0	1446	4	-2	0	91	0	0	4	-6	0	0	0	0	0
1073	0.47	0	99.74	0	1.5	0	0	47	-1	-2	0	75	148	3	16	-6	4	0	0	0	-200
1074	1.78	0	100.01	0	3	1.29	0	51	2	-2	0	-3	201	6	5	-3	-2	0	0	0	-200
1075	1.51	0	99.49	0	1.5	1.3	0	813	4	-2	0	166	1640	29	33	9	29	0	0	0	1600
1076	0.89	0	99.56	0	1	0	0	466	5	-2	0	41	497	6	4	-4	2	0	0	0	-200
1077	3.38	0	100.15	0	3.5	0	0	122	1	-2	0	9	203	52	263	3	97	0	0	0	-200
1078	0.68	0	99.45	0	0.5	-1	0	11	5	-2	0	66	234	3	3	-5	4	0	0	0	300
1079	1.54	0	99.38	0	-0.5	0	0	95	4	-2	0	33	197	5	2	-4	7	0	0	0	600
1080	2.49	0	99.44	0	5	0	0	423	3	-2	0	64	254	10	51	-5	23	0	0	0	500
1081	4.43	0	99.98	0	1	-1	0	79	2	-2	0	105	358	2	11	0	3	0	0	0	-200
1082	0.68	0	99.94	0	1.5	-1	0	383	6	-2	0	76	500	4	-2	-6	9	0	0	0	-200
1083	2.36	0	99.66	0	3.5	2.15	0	29	-1	-2	0	15	55	44	-2	9	38	0	0	0	-200
1084	0	0	97.97	0	0	0	0	250	0	0	0	0	0	26	135	0	82	0	0	0	0
1085	0	0	99.16	0	0	0	0	160	0	0	0	0	0	50	36	0	22	0	0	0	0
1086	0	0	97.66	0	0	0	0	970	0	0	0	0	0	62	90	0	170	0	0	0	0
1087	0	0	99.54	0	0.5	3.23	0	495	5	-2	0	159	400	9	3	0	2	0	0	0	1400
1088	0	0	100.17	0	1	0	0	636	0	0	0	152	0	5	10	0	11	0	0	0	0
1089	0	0	99.49	0	0	0	0	40	0	0	0	55	0	0	0	0	15	0	0	0	0
1090	0	0	100.29	0	-1	0	0	646	0	0	0	109	0	5	13	0	30	0	0	0	0
1091	0	0	99.6	0	0	0	0	20	0	0	0	30	0	0	7	0	7	0	0	0	0
1092	0	0	99.08	0	-1	0	0	120	0	0	0	60	0	0	5	0	13	0	0	0	0
1093	0	0	99.8	0	1	0	0	468	0	0	0	55	0	12	17	0	7	0	0	0	0

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159	W	Pt	Au	Tl	Pb	Bi	Th	U
160	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
161	95.6	0.04	0.32	0.11	2.94	0.5	1.1	0.46
162	70.15	0.06	0.27	0.12	2.41	0.48	1.1	0.3
163	192.7	0.1	0.28	0.06	3.79	0.26	9.09	1.72
164	111.7	0.05	0.13	0.03	2.94	0.36	3.89	1.26
165	58.09	0.03	0.11	0.04	3.26	0.34	1.43	0.73
166	72.59	0.03	0.11	0.03	3.09	0.33	1.51	0.72
167	107.9	0.02323	0.2378	0.1314	37.16	0.2578	1.263	1.076
168	62.79	0.02	0.05	0.17	20.13	0.24	0.79	0.58
169	61.06	0.03	0.05	0.1	26.33	0.11	4.06	0.94
170	145	0.05	0.08	0.03	19.94	0.1	2.2	0.89
171	83.35	0.03	0.05	0.04	18.29	0.12	0.67	0.24
172	49.89	0.02	0.03	0.02	33.03	0.16	0.57	0.2
173	132.9	0.02	0.04	0	8.51	2	5.2	4.8
174	61.34	0.01	0.04	0.16	7.08	0.96	4.33	0.85
175	44.62	0.02	0.01	0.25	5.94	1.49	3.96	0.65
176	87.02	0.01665	0.2043	0.08698	16.52	0.1865	2.559	0.6723
177	167.8	0.07	0.05	0.52	16.42	0.17	22.65	4.13

	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL
178	166.3	0.08	0.06	0.52	16.2	0.16	22.3	4.09													
179	0.56	0	0	0	7.9	0.03	0.02	0.01													
180	1.56	0.04	0.01	3.65	77.08	2.44	3.35	0.87													
181	2.25	0.24	0.08	0.13	29.39	6.74	0.25	0.09													
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284	Br	C	Ca(%)	Ce	Cl	Co	Cr	Cs	Cu	Eu	Fe (%)	Ga	Gd	Hf	Ho	Ir	K (%)	La	Lu	Mn	Na(%)
285				88	2889	13	8	1	20	1.75		21		5				41	0.47	264	
286				58	1102	25	11	-1	26	1.52		22		5				34	0.43	405	
287				81	1785	22	10	-1	20	1.81		22		5				50	0.49	346	
288				73	229	13	8	-1	21	1.47		24		8				40	0.57	287	
289				91	290	26	7	1	38	2.11		28		7				51	0.56	725	
290				82	514	10	12	-1	23	3.56		27		6				53	0.35	535	
291				57	540	30	72	-1	38	1.47		22		5				32	0.39	826	
292				70	645	33	62	-1	39	1.49		22		5				40	0.39	968	
293				21	1969	80	31		10			19									
294				50	1754	78	51		72			19									
295				41	2286	67	189		20			20									

	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL
296				16	2756	70	541		149			16									
297				22	2736	65	209		16			18									
298				7	1746	72	336		91			16									
299				49	1400	68	522		94			17									
300				33	8925	68	58		27			19									
301				19	12663	70	53		13			15									
302				33	8925	68	58		27			19									
303				19	12663	70	53		13			15									
304				22	20027	78	39		15			11									
305				28	6605	66	220		57			17									
306				29	15174	37	206		9			13									
307				27	8093	69	229		22			14									
308						52	11		15			25								2076	
309				11.7		47			196	1.12		23			0.82			4.44	0.31	1481	
310						41	119		15			22								2047	
311						53	132		127			20								2275	
312						46	2		106			20								1557	
313				18.1		57	133		166	1.07		21			0.98			7.5	0.3	1484	
314						56	49		112			21								2704	
315						39			20			23								3221	
316				88.4		40	91		117	1.87		18			1.81			43.3	0.49	1196	
317						28	52					22								569	
318				65		24	44		15	2.47		24			2.94			28.9	1.07	267	
319						45	38		6			23								276	
320						55	482		11											1884	
321						53			170			22								1072	
322				19.8		59	32		194	1.14		22			1.01			8.6	0.32	1708	
323						53			130			24								1655	
324						57	107		161			19								1168	
325						54	75		261			19								1060	
326							7					21								1286	
327							5					17								1613	
328							128					19								9538	
329							89					28								8282	
330							66					20								11573	
331							36					28								5061	
332							3					21								4100	
333							84					17								4688	
334							27					23								2179	
335							56					22								3102	
336							0					24								3720	
337							104					21								3027	
338							103					20								4402	
339							50					22								2872	
340							173					20								3053	
341							49					21								2845	
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343							75					21								2571	
344							102					22								1694	
345							65					20								1940	
346							14					23								1992	
347							87					21								3128	
348							101					19								1729	
349							131					22								1976	
350							81					20								1891	
351							95					18								2003	
352							79					19								1770	
353							94					22								3231	
354							115					22								2702	

	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL
355							79					25								2488	
356							114					20								2345	
357							1					25								1704	
358							1					24								1332	
359							59					22								2999	
360							14					22								2237	
361							16					23								1946	
362							13					23								2653	
363							168					16								1761	
364							69					20								2294	
365							77					22								2899	
366							131					19								1996	
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368							62					19								1643	
369							114					19								1749	
370							50					21								2039	
371							113					19								1921	
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392				30						2			8		2			14	1		
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408				22						1				2				8	0		
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414				23				3		2				3				8	0		
415				29				10		2				4				11	0		
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418				41				7		2				5				15	1		
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432						65	122		160			16								2297	
433						61	135		8			17								2946	
434						54	145		26			18								2469	
435						71	145		434			21								2648	
436						64	162		159			17								2025	
437						72	32		185			18								2000	
438						72	10		117			18								2207	
439						62	161		546			40								2963	
440						58	143		78			16								1906	
441						55	117		163			28								2412	
442						58	158		118			16								2033	
443						64	219		89			15								2112	
444						60	33		130			20								2653	
445						62	58		112			19								1788	
446						60	149		121			18								1939	
447						46	104		28			20								2771	
448						60	169		121			16								2020	
449						42	230		2			12								2275	
450						62	175		149			16								1917	
451						56	177		125			17								1984	
452						69	100		143			17								2483	
453						73	119		91			16								1933	
454						66	70		143			17								1925	
455						67	9		130			18								2586	
456						68	10		125			19								2190	
457						67	7		218			22								2336	
458						60	8		38			22								1820	
459						61	1		74			23								2417	
460						59	8		47			21								2205	
461						68	133		158			15								1757	
462						68	119		101			17								1984	
463						62	18		324			19								2068	
464						62	20		49			17								2080	
465						65	117		160			16								2444	
466						65	145		108			15								2196	
467						60	138		130			15								2184	
468						65	125		96			15								2245	
469						72	14		145			18								2516	
470						61	11		49			20								2148	
471						64	20		17			20								2143	
472						60	9		81			21								1944	

	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL
473						68	112		126			17								1928	
474							84					22									
475							130					21									
476							84					23									
477							78					24									
478							79					22									
479							74					24									
480							148					29									
481							104					25									
482							92					24									
483							177					35								1681	
484							114					23								1659	
485							257					20								803	
486							101					18								964	
487						7	22					9								18	
488						28	31					16								98	
489						86	16					31								385	
490						47	31					20								101	
491						70	17					39								182	
492						26	84					18								669	
493						23	82					20								237	
494						114	89					34								626	
495						64	86					24								418	
496						36	49					8								179	
497						40	63					17								209	
498				209.00				18.00		2.40				4.70				104.00	0.40		
499				36.50				19.20		1.00				5.90				17.70	0.30		
500				29.60				4.00		0.60				2.30				15.10	-0.20		
501				46.90				-1.00		2.10				1.60				24.50	0.40		
502				32.00				2.50		1.10				2.50				16.90	0.40		
503				29.00				-1.00		1.30				1.30				12.20	0.30		
504						56	17					22								500	
505						38	62					23								655	
506						61	67					21								1386	
507						58	54					21								1243	
508						44	25					19								522	
509						57						26								899	
510						50	105					17								763	
511						62	137					28								573	
512						62	124					19								1100	
513						71	121					20								2191	
514						66	120					23								2542	
515						56	121					20								1533	
516						68	117					21								1953	
517						66	118					21								1744	
518						60	112					20								1405	
519						69	122					20								1314	
520						65	124					20								1304	
521						57	118					20								1710	
522						48	86					21								466	
523						43	85					21								494	
524						38	87					18								535	
525						35	79					17								514	
526						27	78					19								508	
527						41	68					21								582	
528						26	74					15								394	
529						30	77					16								400	
530						27	78					17								312	
531						38	62					23								655	

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532						61	67					21								1386	
533						58	54					21								1243	
534																					
535						54	74					20								925	
536						35	81					16								500	
537						61	7		99			23								1700	
538						50	78		1268			22								1775	
539						54	48		506			23								1384	
540						47	35		113			22								2132	
541						62	130		134			20								1441	
542						59	14		79			24								2102	
543						69	91		75			21								1346	
544						54	143		183			20								2110	
545						41	21		11			22								2249	
546	1.84		7.35	17.00		65.90	89.10			1.35	10.20			2.01			0.44	6.35	0.39		3.22
547			5.02	42.70		59.60				2.15	13.50			4.81			0.34	15.70	0.61		2.85
548			6.89	20.10		74.50	87.10			1.62	10.10			2.40			0.39	7.42	0.49		3.56
549			8.06	13.00		56.90	130.00	2.35		1.27	10.40			1.69			0.41	4.42	0.31		1.54
550			5.55	40.80		42.50		1.22		2.32	12.10			5.40				16.10	0.66		2.98
551	-1	1396		6		57	0		109	0.70		20	2.0	1.3	0.6			4	0.2		
552	1	2596		144		25	8		9	2.60		25	13.3	1.3	3.1			44	1.2		
553	2	2026		150		35	2		15	3.10		46	13.5	1.2	3.0			49	1.0		
554	2	652		6		67	0		197	0.90		24	2.4	1.3	0.6			4	0.2		
555	1	2847		204		27	6		6	3.40		14	18.0	1.7	3.9			62	1.3		
556	17	806		19		78	96		74	0.70		19	2.8	1.9	0.7			10	0.3		
557	21	979		19		91	179		38	0.90		23	3.8	2.1	0.9			9	0.4		
558	-1	-500		18		83	149		87	1.00		21	3.3	2.0	0.8			9	0.3		
559	-1	514		19		73	96		17	0.60		25	3.0	2.4	0.8			10	0.3		
560	2	651		65		57	62		8	1.90		22	8.2	4.1	1.9			45	0.7		
561							121					20									
562							25					19									
563						65	804					12								1179	
564						140	1673					26								1402	
565							185		160												
566							110		145												
567							105		138												
568							125		145												
569							75		105												
570							110		22												
571							230		118												
572							90		32												
573							90		128												
574							110		40												
575							300		80												
576							60		20												
577							105		65												
578							250		22												
579							220		145												
580							200		220												
581							120		112												
582							225		162												
583							70		35												
584							125		140												
585							85		220												
586							125		140												
587							5		445												
588							175		172												
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591							1100		128												
592							160		90												
593							135		80												
594							260		177												
595							335		180												
596							245		175												
597							235		190												
598							175		177												
599							265		197												
600							65		360												
601							140		410												
602							30		330												
603						62	90													1456	
604						58	79													1375	
605						44	342													888	
606						103	116					22									
607						123	149					23									
608						97	69					23									
609						97	93					25									
610						79	100					21									
611						105	31					24									
612						98	101					22									
613						84	131					22									
614						84	109					20									
615						88	76					23									
616	21	907		21		50	114		17	1.1		17	3.5	1.4	0.8			9	0.24		
617		307		83		65	93	1	19	1.4		19	4.9	4.1	1.1			23	0.40		
618		215		62		51	121		22	1.3		19	4.9	2.1	1.1			19	0.33		
619		206		133		52	89		31	2.3		23	6.2	3.4	1.3			36	0.55		
620	55	1518		19		61	93			0.7		18	2.5	2.6	0.1			8	0.21		
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787	GA	GD	GE	HF	HG	HO	IN	IR	LA	LI	LU	MO	NB	ND	NI	OS	P	PB	PD	PR	PT
788	19	0	1	5	0	0	0	0	46	18	0	-2	15	40	24	0	0	20	0	9	0
789	21	0	1.5	6	0	0	0	0	48	28	0	3	19	38	18	0	0	11	0	11	0
790	17	0	0.5	5	0	0	0	0	45	17	0	4	15	41	35	0	0	9	0	11	0
791	21	0	-0.5	2	0	0	0	0	-2	9	0	-2	5	15	63	0	0	-2	0	3	0
792	18	0	1.5	3	0	0	0	0	24	10	0	3	10	20	21	0	0	12	0	6	0
793	19	0	2.5	7	0	0	0	0	65	9	0	5	28	36	7	0	0	10	0	10	0
794	17	0	0	0	0	0	0	0	20	5	0	-3	10	19	16	0	0	4	0	4	0
795	16	0	0	0	0	0	0	0	110	4	0	0	21	66	1	0	0	6	0	0	0
796	23	0	1	4	0	0	0	0	43	6	0	2	14	38	30	0	0	2	0	11	0
797	16	0	1	6	0	0	0	0	42	14	0	-2	12	32	16	0	0	28	0	7	0
798	25	0	1	7	0	0	0	0	54	14	0	-2	23	45	10	0	0	10	0	10	0
799	18	0	1	4	0	0	0	0	59	47	0	4	16	45	14	0	0	10	0	7	0
800	18	0	1	4	0	0	0	0	-2	15	0	3	11	18	50	0	0	-2	0	5	0
801	32	0	1.5	6	0	0	0	0	42	37	0	-2	21	37	14	0	0	9	0	8	0
802	16	0	2	6	0	0	0	0	38	7	0	-2	13	34	24	0	0	6	0	9	0
803	18	0	4	2	0	0	0	0	17	1	0	-2	7	28	4	0	0	8	0	6	0
804	15	0	-0.5	7	0	0	0	0	32	2	0	-2	30	39	3	0	0	5	1.09	8	0.78
805	17	0	-0.5	6	0	0	0	0	21	4	0	-2	29	30	1	0	0	4	0	8	0
806	20	0	-0.5	8	0	0	0	0	57	0	0	-2	21	50	1	0	0	8	-0.5	12	-0.5
807	22	0	0	0	0	0	0	0	170	5	0	3	27	86	4	0	0	11	0.61	26	-0.5
808	5	0	0	0	0	0	0	0	49	3	0	-3	32	45	3	0	0	3	1.06	13	1.22
809	20	0	0	0	0	0	0	0	54	3	0	-3	18	32	2	0	0	11	0	9	0
810	20	0	0	0	0	0	0	0	7	4	0	5	6	11	67	0	0	4	0	-3	0
811	9	0	0	0	0	0	0	0	31	1	0	-3	6	24	10	0	0	3	0.63	7	0.8
812	19	0	0	0	0	0	0	0	87	6	0	-3	17	21	4	0	0	9	0	8	0
813	21	0	0	0	0	0	0	0	76	17	0	-3	18	42	29	0	0	10	0	12	0
814	19	0	0	0	0	0	0	0	81	15	0	-3	14	36	2	0	0	11	0.73	0	0.51
815	17	0	0	0	0	0	0	0	90	9	0	0	24	56	5	0	0	6	0	0	0
816	0	0	0	0	0	0	0	0	-10	0	0	0	12	0	133	0	0	24	0	0	0
817	0	0	0	0	0	0	0	0	100	0	0	0	40	0	3	0	0	24	0	0	0
818	17	0	0	0	0	0	0	0	53	3	0	0	8	15	10	0	0	4	0	0	0
819	18	0	0	0	0	0	0	0	19	10	0	-3	26	27	-2	0	0	5	-0.5	0	-0.5
820	0	0	0	0	0	0	0	0	65	0	0	0	0	0	9	0	0	5	0	0	0
821	0	0	0	0	0	0	0	0	20	1	0	0	44	0	3	0	0	8	0	0	0
822	24	0	0	0	0	0	0	0	98	1	0	0	35	84	2	0	0	-2	0	0	0
823	17	0	0	0	0	0	0	0	80	13	0	0	24	46	4	0	0	8	0	0	0
824	18	0	1.5	4	0	0	0	0	25	45	0	-2	12	21	84	0	0	12	0	4	0
825	29	0	2	2	0	0	0	0	54	13	0	-2	21	52	45	0	0	4	0	13	0

	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL
826	24	0	1	4	0	0	0	0	30	9	0	-2	17	34	28	0	0	2	0	8	0
827	15	0	0.5	5	0	0	0	0	27	16	0	2	15	25	11	0	0	6	0	6	0
828	20	0	4	6	0	0	0	0	108	4	0	2	31	52	2	0	0	11	0	15	0
829	19	0	1	8	0	0	0	0	26	-1	0	-2	30	39	0	0	0	9	0.6	8	0.51
830	0	0	0	0	0	0	0	0	-20	0	0	0	5	0	0	0	0	-2	0	0	0
831	13	0	0	0	0	0	0	0	40	3	0	0	7	17	21	0	0	5	0	0	0
832	17	0	0.5	-2	0	0	0	0	12	23	0	-2	7	16	76	0	0	7	0	4	0
833	22	0	1	5	0	0	0	0	45	18	0	-2	19	39	34	0	0	8	0	8	0
834	13	0	1	4	0	0	0	0	36	10	0	-2	12	28	26	0	0	4	0	9	0
835	11	0	0.5	5	0	0	0	0	49	23	0	-2	16	41	7	0	0	7	0	11	0
836	10	0	0.5	13	0	0	0	0	33	3	0	-2	10	29	13	0	0	12	0	7	0
837	23	0	1	4	0	0	0	0	51	13	0	-2	17	43	36	0	0	15	0	10	0
838	12	0	1	4	0	0	0	0	36	12	0	2	11	31	23	0	0	5	0	7	0
839	8	0	0.5	4	0	0	0	0	30	5	0	-2	12	25	6	0	0	11	0	8	0
840	22	0	2	9	0	0	0	0	31	10	0	4	15	28	9	0	0	31	0	7	0
841	6	0	1.5	6	0	0	0	0	7	3	0	-2	12	4	3	0	0	6	0	3	0
842	14	0	1.5	7	0	0	0	0	23	3	0	7	15	19	9	0	0	175	0	3	0
843	18	0	0	0	0	0	0	0	30	15	0	-3	12	25	18	0	0	229	0	7	0
844	18	0	0	0	0	0	0	0	47	4	0	-3	18	32	3	0	0	6	0	10	0
845	21	0	0	0	0	0	0	0	30	3	0	-3	42	37	2	0	0	10	0.63	10	0.5
846	20	0	0	0	0	0	0	0	71	12	0	5	30	55	69	0	0	7	0	13	0
847	21	0	0	0	0	0	0	0	41	9	0	3	51	43	17	0	0	9	0	11	0
848	19	0	0	0	0	0	0	0	92	17	0	-2	32	59	4	0	0	6	-0.5	17	0.51
849	18	0	0	0	0	0	0	0	10	19	0	5	4	8	67	0	0	5	0	-3	0
850	6	0	0	0	0	0	0	0	24	3	0	-3	7	21	7	0	0	14	0	6	0
851	21	0	0	0	0	0	0	0	22	5	0	-3	3	14	2	0	0	16	0	4	0
852	19	0	0	0	0	0	0	0	89	6	0	3	17	28	3	0	0	13	-0.5	9	-0.5
853	0	0	0	0	0	0	0	0	64	0	0	0	0	0	25	0	0	5	0	0	0
854	0	0	0	0	0	0	0	0	185	0	0	0	0	0	52	0	0	20	0	0	0
855	20	0	0	0	0	0	0	0	60	5	0	-3	25	31	2	0	0	17	0.62	0	0.58
856	0	0	0	0	0	0	0	0	64	0	0	0	0	0	80	0	0	5	0	0	0
857	0	0	0	0	0	0	0	0	89	0	0	0	0	0	33	0	0	5	0	0	0
858	0	0	0	0	0	0	0	0	25	0	0	0	16	0	35	0	0	36	0	0	0
859	0	0	0	0	0	0	0	0	-60	0	0	0	0	0	37	0	0	10	0	0	0
860	0	0	0	0	0	0	0	0	30	0	0	0	22	0	10	0	0	50	0	0	0
861	16	0	0	0	0	0	0	0	58	13	0	0	20	34	3	0	0	6	0	0	0
862	19	0	1	6	0	0	0	0	48	8	0	-2	16	39	24	0	0	6	0	10	0
863	20	0	1	7	0	0	0	0	53	14	0	-2	18	50	40	0	0	8	0	13	0
864	20	0	1.5	5	0	0	0	0	58	20	0	5	24	48	15	0	0	6	0	14	0
865	21	0	1	5	0	0	0	0	17	48	0	5	10	23	67	0	0	8	0	7	0
866	22	0	1	6	0	0	0	0	45	12	0	-2	21	38	11	0	0	6	0	10	0
867	15	0	3	4	0	0	0	0	16	1	0	3	-2	9	3	0	0	-2	0	3	0
868	22	0	0	0	0	0	0	0	8	8	0	7	8	13	31	0	0	4	0	-3	0
869	18	0	0	0	0	0	0	0	66	6	0	0	15	49	15	0	0	8	0	0	0
870	23	0	1	5	0	0	0	0	42	10	0	-2	14	37	31	0	0	5	0	10	0
871	17	0	-0.5	3	0	0	0	0	15	15	0	3	10	18	60	0	0	9	0	9	0
872	16	0	1	5	0	0	0	0	47	10	0	-2	15	42	30	0	0	5	0	13	0
873	27	0	1	4	0	0	0	0	45	7	0	-2	21	41	29	0	0	4	0	12	0
874	12	0	0.5	4	0	0	0	0	18	6	0	-2	12	21	12	0	0	9	0	5	0
875	18	0	1	6	0	0	0	0	44	12	0	-2	20	36	13	0	0	5	0	10	0
876	19	0	1	-2	0	0	0	0	13	16	0	-2	8	22	57	0	0	13	0	6	0
877	18	0	1	5	0	0	0	0	41	14	0	-2	16	37	31	0	0	5	0	7	0
878	21	0	3	7	0	0	0	0	35	2	0	-2	34	52	5	0	0	5	0	13	0
879	5	0	9	-2	0	0	0	0	34	1	0	48	7	26	58	0	0	1914	0	8	0
880	17	0	0	0	0	0	0	0	45	3	0	-3	22	59	4	0	0	7	0	15	0
881	23	0	0	0	0	0	0	0	29	5	0	-3	3	14	7	0	0	5	0	4	0
882	20	0	0	0	0	0	0	0	135	12	0	3	36	73	2	0	0	21	-0.5	22	0.71
883	21	0	0	0	0	0	0	0	66	17	0	-3	31	37	4	0	0	13	0.51	10	0.53
884	20	0	0	0	0	0	0	0	86	2	0	-3	18	62	3	0	0	5	0.68	16	0.51

	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL
885	18	0	0	0	0	0	0	0	8	12	0	5	6	10	39	0	0	2	0	-3	0
886	20	0	0	0	0	0	0	0	12	13	0	6	6	15	42	0	0	243	0	4	0
887	-1	0	0	0	0	0	0	0	5	-1	0	-3	1	3	3	0	0	4	0	-3	0
888	20	0	0	0	0	0	0	0	78	4	0	-3	25	48	6	0	0	14	0.71	13	0.61
889	22	0	0	0	0	0	0	0	10	12	0	6	6	16	56	0	0	4	0	3	0
890	17	0	0	0	0	0	0	0	38	10	0	-3	26	48	5	0	0	7	1.04	0	0.57
891	0	0	0	0	0	0	0	0	20	0	0	0	8	0	0	0	0	-2	0	0	0
892	20	0	0	0	0	0	0	0	36	7	0	0	46	25	1	0	0	18	0	0	0
893	0	0	0	0	0	0	0	0	-20	0	0	0	5	0	0	0	0	-2	0	0	0
894	0	0	0	0	0	0	0	0	33	0	0	0	18	36	70	0	0	22	0	0	0
895	0	0	0	0	0	0	0	0	30	0	0	0	24	0	0	0	0	-2	0	0	0
896	0	0	0	0	0	0	0	0	-60	0	0	0	0	0	78	0	0	15	0	0	0
897	0	0	0	0	0	0	0	0	62	0	0	0	0	0	23	0	0	5	0	0	0
898	20	0	0	0	0	0	0	0	33	7	0	0	40	22	1	0	0	17	0	0	0
899	15	0	0.5	6	0	0	0	0	30	5	0	3	17	31	33	0	0	4	0	9	0
900	13	0	-0.5	-2	0	0	0	0	3	9	0	5	3	8	86	0	0	-2	0	2	0
901	19	0	0.5	2	0	0	0	0	7	24	0	-2	5	14	70	0	0	6	0	3	0
902	26	0	1.5	3	0	0	0	0	28	18	0	-2	17	24	40	0	0	5	0	7	0
903	41	0	1	11	0	0	0	0	49	9	0	-2	23	47	26	0	0	6	0	10	0
904	22	0	0	0	0	0	0	0	100	4	0	-3	41	74	3	0	0	9	0.5	19	0.51
905	18	0	0	0	0	0	0	0	28	12	0	0	20	22	3	0	0	17	0	0	0
906	16	0	1	7	0	0	0	0	37	13	0	-2	13	32	15	0	0	11	0	8	0
907	23	0	0.5	5	0	0	0	0	57	16	0	-2	18	46	34	0	0	8	0	10	0
908	15	0	1	6	0	0	0	0	55	13	0	-2	15	50	24	0	0	12	0	13	0
909	22	0	2	5	0	0	0	0	45	13	0	-2	18	38	31	0	0	5	0	12	0
910	23	0	1	-2	0	0	0	0	22	13	0	7	6	18	65	0	0	5	0	4	0
911	14	0	0.5	6	0	0	0	0	30	8	0	2	12	24	26	0	0	4	0	5	0
912	29	0	1	-2	0	0	0	0	9	33	0	-2	6	12	80	0	0	7	0	3	0
913	19	0	0.5	4	0	0	0	0	14	22	0	3	6	26	54	0	0	5	0	4	0
914	19	0	0.5	5	0	0	0	0	39	31	0	3	18	33	16	0	0	11	0	11	0
915	19	0	0.5	5	0	0	0	0	76	10	0	-2	22	64	9	0	0	10	0	16	0
916	17	0	1	4	0	0	0	0	12	12	0	4	8	17	46	0	0	9	0	9	0
917	22	0	0.5	4	0	0	0	0	38	7	0	-2	16	32	21	0	0	2	0	8	0
918	17	0	1	3	0	0	0	0	25	10	0	-2	8	26	59	0	0	6	0	3	0
919	25	0	4	10	0	0	0	0	48	3	0	-2	21	47	16	0	0	6	0	13	0
920	9	0	1	6	0	0	0	0	0	0	0	-2	16	0	-1	0	0	6	0	0	0
921	3	0	1.5	5	0	0	0	0	18	7	0	-2	6	14	9	0	0	3	0	4	0
922	11	0	0	0	0	0	0	0	27	9	0	-3	8	21	17	0	0	41	0	6	0
923	24	0	0	0	0	0	0	0	23	3	0	-3	13	33	-2	0	0	3	0	6	0
924	8	0	0	0	0	0	0	0	18	2	0	-3	7	15	5	0	0	2	0.85	4	0.7
925	18	0	0	0	0	0	0	0	50	6	0	3	16	41	10	0	0	5	0	10	0
926	15	0	0	0	0	0	0	0	-3	5	0	5	2	-3	95	0	0	3	0	-3	0
927	22	0	0	0	0	0	0	0	110	1	0	-3	44	105	8	0	0	4	0	26	0
928	24	0	0	0	0	0	0	0	62	3	0	4	15	52	6	0	0	31	0	13	0
929	15	0	0	0	0	0	0	0	4	8	0	5	4	6	120	0	0	4	0	-3	0
930	27	0	0	0	0	0	0	0	19	8	0	5	13	30	-2	0	0	12	0	5	0
931	22	0	0	0	0	0	0	0	78	14	0	3	24	63	6	0	0	5	0.6	16	0.58
932	19	0	0	0	0	0	0	0	38	3	0	-3	39	41	-2	0	0	12	0.5	11	-0.5
933	19	0	0	0	0	0	0	0	10	6	0	-3	8	8	3	0	0	10	0	3	0
934	19	0	0	0	0	0	0	0	63	16	0	-3	21	35	21	0	0	10	0	10	0
935	16	0	0	0	0	0	0	0	108	21	0	-3	21	51	2	0	0	13	0	0	0
936	19	0	0	0	0	0	0	0	86	1	0	0	28	61	20	0	0	4	0	0	0
937	0	0	0	0	0	0	0	0	25	0	0	0	22	0	14	0	0	32	0	0	0
938	16	0	0	0	0	0	0	0	59	13	0	0	23	40	4	0	0	6	0	0	0
939	0	0	0	0	0	0	0	0	80	7	0	0	28	0	5	0	0	-2	0	0	0
940	0	0	0	0	0	0	0	0	64	0	0	0	0	0	50	0	0	15	0	0	0
941	16	0	0	0	0	0	0	0	84	12	0	0	21	49	2	0	0	14	0	0	0
942	0	0	0	0	0	0	0	0	20	0	0	0	20	0	0	0	0	2	0	0	0
943	14	0	1	6	0	0	0	0	36	10	0	-2	12	31	21	0	0	6	0	9	0

	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL
944	19	0	1	6	0	0	0	0	42	14	0	-2	20	36	12	0	0	6	0	8	0
945	12	0	-0.5	2	0	0	0	0	16	10	0	4	9	26	35	0	0	7	0	6	0
946	19	0	0.5	5	0	0	0	0	49	12	0	-2	20	41	11	0	0	5	0	11	0
947	18	0	0	0	0	0	0	0	29	8	0	0	12	39	5	0	0	8	0	0	0
948	29	0	1.5	4	0	0	0	0	66	19	0	-2	19	57	38	0	0	16	0	14	0
949	27	0	1.5	3	0	0	0	0	35	24	0	-2	18	33	30	0	0	25	0	11	0
950	20	0	1	4	0	0	0	0	36	17	0	-2	15	33	21	0	0	8	0	6	0
951	18	0	0.5	2	0	0	0	0	6	15	0	-2	6	11	70	0	0	2	0	4	0
952	17	0	1	5	0	0	0	0	32	25	0	-2	14	30	25	0	0	7	0	6	0
953	16	0	1.5	4	0	0	0	0	37	34	0	3	14	32	22	0	0	54	0	8	0
954	5	0	0.5	3	0	0	0	0	10	4	0	-2	4	10	12	0	0	3	0	-2	0
955	16	0	-0.5	3	0	0	0	0	4	6	0	3	6	15	69	0	0	3	0	3	0
956	20	0	4	7	0	0	0	0	42	3	0	3	35	45	5	0	0	6	0	13	0
957	16	0	3	6	0	0	0	0	37	1	0	3	23	39	4	0	0	11	0	10	0
958	20	0	3	7	0	0	0	0	89	8	0	-2	33	58	3	0	0	11	0	15	0
959	17	0	2.5	8	0	0	0	0	50	2	0	-2	15	47	7	0	0	-2	0	13	0
960	19	0	0	0	0	0	0	0	11	9	0	6	6	15	36	0	0	7	0	-3	0
961	20	0	2	0	0	0	0	0	11	6	0	5	6	20	35	0	0	2	0	-3	0
962	20	0	0	0	0	0	0	0	87	15	0	-3	35	51	5	0	0	7	0.75	15	0.65
963	21	0	0	0	0	0	0	0	18	1	0	-3	24	28	3	0	0	10	0	7	0
964	8	0	0	0	0	0	0	0	25	6	0	-3	5	19	13	0	0	5	0	4	0
965	1	0	0	0	0	0	0	0	8	-1	0	-3	2	6	4	0	0	4	0	-3	0
966	15	0	0.5	0	0	0	0	0	6	2	0	3	6	3	3	0	0	2	0	-3	0
967	27	0	0	0	0	0	0	0	16	7	0	5	7	23	2	0	0	15	0	4	0
968	22	0	0	0	0	0	0	0	78	2	0	-3	26	44	3	0	0	9	0.79	14	0.64
969	6	0	0	0	0	0	0	0	24	5	0	-3	55	20	10	0	0	6	0	5	0
970	17	0	0	0	0	0	0	0	88	3	0	-3	8	41	-2	0	0	8	0.73	13	0.54
971	18	0	0	0	0	0	0	0	8	5	0	6	3	9	56	0	0	4	0	-3	0
972	17	0	1.5	0	0	0	0	0	24	5	0	5	8	37	6	0	0	4	0	7	0
973	0	0	0	0	0	0	0	0	50	0	0	0	26	0	0	0	0	2	0	0	0
974	0	0	0	0	0	0	0	0	-20	0	0	0	14	0	0	0	0	-2	0	0	0
975	19	0	0	0	0	0	0	0	61	2	0	-3	23	52	2	0	0	8	0	0	0
976	0	0	0	0	0	0	0	0	40	0	0	0	6	0	0	0	0	26	0	0	0
977	19	0	0	0	0	0	0	0	75	8	0	0	32	67	18	0	0	11	0	0	0
978	0	0	0	0	0	0	0	0	-60	0	0	0	0	0	32	0	0	5	0	0	0
979	19	0	0	0	0	0	0	0	72	14	0	0	33	63	3	0	0	11	0	0	0
980	0	0	0	0	0	0	0	0	10	0	0	0	5	11	88	0	0	8	0	0	0
981	17	0	0	0	0	0	0	0	116	7	0	0	19	83	52	0	0	8	0	0	0
982	0	0	0	0	0	0	0	0	40	0	0	0	12	0	59	0	0	38	0	0	0
983	0	0	0	0	0	0	0	0	62	0	0	0	0	0	36	0	0	15	0	0	0
984	19	0	0	0	0	0	0	0	82	18	0	-3	26	38	2	0	0	4	-0.5	0	-0.5
985	18	0	0	0	0	0	0	0	124	10	0	-3	28	45	-2	0	0	3	0.57	0	-0.5
986	16	0	0	0	0	0	0	0	50	0	0	-3	6	4	3	0	0	34	0	0	0
987	0	0	0	0	0	0	0	0	18	0	0	0	8	19	110	0	0	7	0	0	0
988	16	0	0	0	0	0	0	0	17	7	0	0	19	23	1	0	0	10	0	0	0
989	17	0	0.5	3	0	0	0	0	13	12	0	2	9	16	54	0	0	5	0	7	0
990	18	0	1	9	0	0	0	0	57	31	0	-2	19	51	6	0	0	15	0	13	0
991	16	0	1	5	0	0	0	0	42	12	0	-2	14	38	26	0	0	8	0	8	0
992	22	0	0.5	3	0	0	0	0	-2	7	0	2	8	20	43	0	0	12	0	8	0
993	20	0	0.5	2	0	0	0	0	3	16	0	5	7	14	72	0	0	4	0	5	0
994	18	0	1	6	0	0	0	0	33	13	0	-2	17	29	15	0	0	7	0	5	0
995	22	0	1.5	8	0	0	0	0	39	12	0	-2	18	38	33	0	0	7	0	9	0
996	18	0	0.5	5	0	0	0	0	26	5	0	-2	11	26	17	0	0	13	0	5	0
997	23	0	1	7	0	0	0	0	32	17	0	-2	21	31	15	0	0	5	0	6	0
998	17	0	-0.5	-2	0	0	0	0	3	7	0	3	4	9	78	0	0	2	0	-2	0
999	21	0	2.5	5	0	0	0	0	17	9	0	4	10	22	66	0	0	3	0	5	0
1000	22	0	1	6	0	0	0	0	24	3	0	-2	30	47	1	0	0	4	0.57	12	0.68
1001	21	0	0	0	0	0	0	0	48	-1	0	-3	28	21	2	0	0	10	0.6	7	0.56
1002	16	0	0	0	0	0	0	0	62	6	0	-3	15	17	3	0	0	9	0	5	0

	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL
1003	21	0	0	0	0	0	0	0	135	6	0	-3	25	77	7	0	0	6	0	21	0
1004	22	0	0	0	0	0	0	0	29	8	0	-3	2	15	5	0	0	6	0	5	0
1005	15	0	0	0	0	0	0	0	3	3	0	4	2	4	102	0	0	4	0	-3	0
1006	13	0	0	0	0	0	0	0	40	20	0	-3	11	29	17	0	0	28	0	8	0
1007	12	0	0	0	0	0	0	0	24	6	0	-3	11	20	14	0	0	16	0	4	0
1008	21	0	0	0	0	0	0	0	8	10	0	9	6	13	49	0	0	12	0	3	0
1009	1	0	0	0	0	0	0	0	21	1	0	15	51	13	38	0	0	19	0	-3	0
1010	22	0	0	0	0	0	0	0	93	9	0	3	21	45	3	0	0	10	0	14	0
1011	12	0	0	0	0	0	0	0	18	1	0	3	9	12	2	0	0	2	0	3	0
1012	21	0	0	0	0	0	0	0	41	16	0	-2	29	52	4	0	0	7	-0.5	9	-0.5
1013	18	0	0	0	0	0	0	0	104	3	0	0	42	91	13	0	0	4	0	0	0
1014	16	0	0	0	0	0	0	0	138	8	0	0	32	72	4	0	0	9	0	0	0
1015	0	0	0	0	0	0	0	0	40	0	0	0	30	0	9	0	0	28	0	0	0
1016	0	0	0	0	0	0	0	0	63	0	0	0	0	0	45	0	0	5	0	0	0
1017	0	0	0	0	0	0	0	0	16	0	0	0	7	19	133	0	0	2	0	0	0
1018	0	0	0	0	0	0	0	0	20	0	0	0	26	0	3	0	0	42	0	0	0
1019	17	0	0	0	0	0	0	0	76	4	0	0	9	56	45	0	0	5	0	0	0
1020	18	0	0	0	0	0	0	0	86	17	0	-3	25	45	2	0	0	11	0.51	0	0.59
1021	0	0	0	0	0	0	0	0	-20	0	0	0	7	0	0	0	0	5	0	0	0
1022	15	0	0	0	0	0	0	0	10	1	0	0	14	8	2	0	0	-2	0	0	0
1023	19	0	0.5	-2	0	0	0	0	5	22	0	-2	6	12	100	0	0	3	0	2	0
1024	26	0	0.5	4	0	0	0	0	44	9	0	-2	20	40	30	0	0	3	0	10	0
1025	12	0	0.5	7	0	0	0	0	64	24	0	-2	13	57	13	0	0	12	0	15	0
1026	10	0	0.5	6	0	0	0	0	41	6	0	-2	18	33	6	0	0	7	0	8	0
1027	19	0	0.5	6	0	0	0	0	40	21	0	2	18	36	23	0	0	10	0	8	0
1028	0	0	0	0	0	0	0	0	30	0	0	0	10	0	0	0	0	2	0	0	0
1029	21	0	0	0	0	0	0	0	166	4	0	3	50	89	-2	0	0	9	-0.5	30	0.53
1030	24	0	2	4	0	0	0	0	32	32	0	-2	15	32	45	0	0	9	0	8	0
1031	15	0	1	5	0	0	0	0	21	27	0	-2	10	22	32	0	0	9	0	5	0
1032	16	0	0.5	4	0	0	0	0	19	15	0	4	10	26	57	0	0	9	0	6	0
1033	19	0	0.5	10	0	0	0	0	56	12	0	-2	19	52	7	0	0	11	0	11	0
1034	12	0	1.5	4	0	0	0	0	30	23	0	6	10	27	19	0	0	98	0	6	0
1035	20	0	0.5	3	0	0	0	0	11	9	0	2	9	17	54	0	0	5	0	-2	0
1036	20	0	-0.5	3	0	0	0	0	24	17	0	3	10	26	70	0	0	17	0	6	0
1037	12	0	1	5	0	0	0	0	42	8	0	2	11	35	22	0	0	9	0	10	0
1038	8	0	1.5	8	0	0	0	0	24	2	0	-2	8	20	12	0	0	14	0	2	0
1039	7	0	1.5	5	0	0	0	0	33	2	0	-2	15	32	-1	0	0	9	0	7	0
1040	7	0	0	0	0	0	0	0	57	1	0	3	16	39	-2	0	0	8	0.6	12	0.52
1041	17	0	0	0	0	0	0	0	10	7	0	5	4	8	82	0	0	2	0	-3	0
1042	19	0	0	0	0	0	0	0	42	4	0	-3	14	42	7	0	0	26	0	9	0
1043	22	0	0	0	0	0	0	0	8	7	0	-3	1	6	5	0	0	11	0	-3	0
1044	23	0	2	0	0	0	0	0	3	3	0	-3	12	2	3	0	0	5	0.75	-3	0.8
1045	21	0	0	0	0	0	0	0	121	10	0	-3	37	58	3	0	0	14	0	19	0
1046	23	0	0	0	0	0	0	0	14	4	0	6	9	23	15	0	0	2	0	3	0
1047	21	0	0	0	0	0	0	0	94	15	0	4	31	60	15	0	0	8	0.83	14	0.79
1048	19	0	0	0	0	0	0	0	42	10	0	3	43	42	19	0	0	8	0	12	0
1049	19	0	0	0	0	0	0	0	58	10	0	-3	24	30	7	0	0	10	0.65	7	0.6
1050	24	0	0	0	0	0	0	0	97	2	0	-3	31	68	5	0	0	11	0	19	0
1051	19	0	0	0	0	0	0	0	113	5	0	-3	33	48	3	0	0	13	-0.5	15	0.62
1052	26	0	0	0	0	0	0	0	9	3	0	-3	1	-3	3	0	0	1	-0.5	-3	0.53
1053	19	0	0	0	0	0	0	0	121	6	0	3	32	72	3	0	0	11	0	22	0
1054	0	0	0	0	0	0	0	0	-60	0	0	0	0	0	36	0	0	5	0	0	0
1055	18	0	0	0	0	0	0	0	39	7	0	-3	29	47	3	0	0	9	0.57	0	-0.5
1056	18	0	0	0	0	0	0	0	74	10	0	-3	23	37	7	0	0	10	0.77	0	0.66
1057	0	0	0	0	0	0	0	0	-60	0	0	0	0	0	100	0	0	5	0	0	0
1058	19	0	0	0	0	0	0	0	117	2	0	0	10	98	7	0	0	10	0	0	0
1059	17	0	0	0	0	0	0	0	70	0	0	-3	42	34	4	0	0	24	0	0	0
1060	19	0	1	7	0	0	0	0	58	19	0	-2	18	47	14	0	0	5	0	11	0
1061	22	0	1	4	0	0	0	0	72	24	0	-2	24	58	10	0	0	13	0	15	0

	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA	BB	BC	BD	BE	BF	BG	BH	BI	BJ	BK	BL
1062	21	0	-0.5	4	0	0	0	0	11	6	0	3	9	21	60	0	0	5	0	7	0
1063	23	0	0	0	0	0	0	0	72	2	0	-3	47	83	3	0	0	8	-0.5	21	0.54
1064	16	0	0.5	2	0	0	0	0	8	8	0	4	5	12	71	0	0	19	0	-2	0
1065	20	0	1.5	4	0	0	0	0	51	14	0	3	16	48	33	0	0	9	0	12	0
1066	17	0	0.5	5	0	0	0	0	27	11	0	-2	14	27	16	0	0	11	0	5	0
1067	19	0	-0.5	-2	0	0	0	0	-2	15	0	-2	7	16	81	0	0	5	0	4	0
1068	7	0	2	5	0	0	0	0	30	7	0	-2	8	23	11	0	0	6	0	8	0
1069	5	0	1.5	4	0	0	0	0	24	1	0	-2	6	17	4	0	0	-2	0	5	0
1070	21	0	2	8	0	0	0	0	89	11	0	-2	19	44	31	0	0	9	0	13	0
1071	10	0	-0.5	5	0	0	0	0	59	1	0	-2	26	37	1	0	0	5	0.68	10	0.5
1072	5	0	-0.5	6	0	0	0	0	26	4	0	-2	37	44	0	0	0	4	0.58	10	0.71
1073	3	0	0	0	0	0	0	0	35	1	0	-3	6	29	5	0	0	5	0	7	0
1074	20	0	0	0	0	0	0	0	-3	1	0	-3	2	-3	5	0	0	-1	0.69	-3	0.59
1075	24	0	0	0	0	0	0	0	79	6	0	5	30	68	28	0	0	11	-0.5	19	0.53
1076	27	0	0	0	0	0	0	0	27	5	0	-3	61	11	-2	0	0	5	0	3	0
1077	16	0	0	0	0	0	0	0	55	17	0	4	2	5	117	0	0	5	0	-3	0
1078	20	0	0	0	0	0	0	0	25	2	0	-3	28	36	3	0	0	6	-0.5	10	-0.5
1079	20	0	0	0	0	0	0	0	15	4	0	-3	2	11	6	0	0	4	0	-3	0
1080	18	0	0	0	0	0	0	0	30	19	0	-3	14	24	20	0	0	161	0	7	0
1081	31	0	0	0	0	0	0	0	55	3	0	-3	107	31	15	0	0	9	1.08	10	0.73
1082	20	0	0	0	0	0	0	0	35	1	0	-3	32	29	2	0	0	13	0.6	9	0.56
1083	30	0	0	0	0	0	0	0	16	-1	0	18	-1	7	22	0	0	10	0.59	6	0.7
1084	0	0	0	0	0	0	0	0	66	0	0	0	0	0	62	0	0	5	0	0	0
1085	0	0	0	0	0	0	0	0	64	0	0	0	0	0	39	0	0	10	0	0	0
1086	0	0	0	0	0	0	0	0	60	0	0	0	0	0	60	0	0	5	0	0	0
1087	20	0	0	0	0	0	0	0	89	10	0	-3	23	42	2	0	0	10	0.62	0	-0.5
1088	20	0	0	0	0	0	0	0	81	6	0	0	25	66	4	0	0	10	0	0	0
1089	0	0	0	0	0	0	0	0	20	0	0	0	16	0	0	0	0	-2	0	0	0
1090	15	0	0	0	0	0	0	0	73	7	0	0	21	39	6	0	0	6	0	0	0
1091	0	0	0	0	0	0	0	0	40	0	0	0	9	0	9	0	0	-2	0	0	0
1092	15	0	0	0	0	0	0	0	30	0	0	-3	12	8	2	0	0	55	0	0	0
1093	21	0	0	0	0	0	0	0	19	8	0	0	41	54	8	0	0	8	0	0	0

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285	16		5	4	54			13		8	8	136	2	1.29	4805	21	4	66	-2	34	3.58
286	15		7	6	62			20		7	1	162	2	1.29	7668	15	2	136	-2	30	3.30
287	15		6	8	54			15		7	6	157	2	1.30	6492	17	-2	108	-2	33	3.64
288	17		4	4	29			17		7	bd	69	2	1.21	5305	19	-2	70	-2	35	3.96
289	22		17	4	29			17		9	bd	70	3	1.35	8100	19	3	137	-2	39	4.08
290	12		11	4	21			18		6	2	130	3	1.01	5201	13	-2	62	-2	26	2.80
291	13		64	4	55			22		6	12	138	3	0.88	6168	15	-2	148	-2	26	2.73
292	13		67	2	79			22		7	bd	143	3	1.10	6053	15	-2	176	-2	29	3.12
293		13	39		4	9		44				67						445		24	
294		28	34		6	28		43				56						467		35	
295		19	79		9	13		34				83						339		31	

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298		18	67		46	29		38				103						369		25	
299		0	86		28	32		36				108						316		22	
300		14	146		195	98		26				140						228		20	
301		3	80		115	196		34				119						297		23	
302		14	146		195	98		26				140						228		20	
303		3	80		115	196		34				119						297		23	
304		0	20		26	310		14				182						153		13	
305		13	51		42	375		36				116						356		27	
306		15	31		35	227		31				124						319		27	
307		0	43		62	150		34				143						312		23	
308	7		67	28				39				26			10964			365		42	
309	4	8.42	50	23	14			32		2.49		143		0.58	8872			488		23	2.17
310	7		80	24				43				41			9075			317		46	
311	6		93	24				43				184			8064			355		30	
312	6		46	26	35			45				140			7868			371		31	
313	7	11.7	90	25	29			37		3.27		174		0.7	8121			309		24	2.23
314	7		64	27	29			46				74			9295			361		34	
315	7		53	31	12			49				106			11674			439		34	
316	7	42.8	79	24	40			33		8.81		622		1.41	7003			206		40	3.68
317	19		4					12				30			2617			7		95	
318	15	40.4	7	1				19		11.5		18		2.2	3152			24		80	7.71
319	27		26	2	9			29				38			4255			10		67	
320	4		64									58			7574			418		55	
321	3		56	25	159			47				253			10350			542		18	
322	5	12.3	99	28	31			30		3.46		197		0.71	9550			317		25	2.35
323	11		30	28	44			37				137			12115			332		42	
324	3		83	22	69			47				232			6346			308		21	
325	3		96	15	97			46				147			7879			401		22	
326	17		11	8	22			45				431			17454			161		80	
327	16		12	14	46			30				199			10817			74		67	
328	13		43	14	10			60				218			14800			495		70	
329	18		78	48	7			52				169			15010			558		91	
330	13		40	140	25			46				324			11362			414		57	
331	5		22	43	61			34				614			5193			254		27	
332	13		9	26	21			29				614			7810			179		62	
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335	6		91	35	19			43				124			6614			289		23	
336	7		31	15	18			43				325			12000			625		30	
337	7		58	36	17			51				214			8728			394		30	
338	6		66	19	30			46				141			7882			353		26	
339	6		73	33	44			43				161			7794			332		28	
340	7		91	20	17			52				122			8371			361		28	
341	6		57	26	25			42				166			7344			335		26	
342	12			9	70							142								29	
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345	14		46	8	36			45				144			13251			418		42	
346	11		42	7	165			49				44			11984			499		40	
347	12		66	18	109							67			16626			414		46	
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349	9		68	5	15							85			9094			413		33	
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352	8		81	27	45			46				114			8740			387		28	
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358	16		11	8	80							79			11304			162		56	
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362	15		33	48	186			43				29			19871			380		56	
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364	6		90	10	47			48				124			8669			379		26	
365	11		56	40	101			50				59			14782			590		40	
366	6		95	41	97			47				96			6752			331		25	
367	8			5	9							164								26	
368	7		78	14	23			47				161			7768			348		27	
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370	9		60	12	85			45				183			12288			443		36	
371	7		86	9	13			47				191			8361			371		27	
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432	6		74	144	24			44				183			7707			340		23	
433	6		77	164	39			46				99			7760			346		21	
434	7		81	134	229			46				59			7848			350		23	
435	6		76	584	57			44				87			7302			344		20	
436	5		78	388	46			44				97			6400			329		17	
437	6		78	174	25			39				140			7950			328		21	
438	7		55	61	37			41				132			9357			400		22	
439	11		105	107	321			51				17			8700			443		30	
440	6		74	92	44			46				81			6231			324		19	
441	5		72	1580	50			43				69			7127			327		15	
442	7		84	126	25			48				110			7084			332		21	
443	6		95	65	35			47				92			6705			323		21	
444	7		60	433	32			38				106			7933			337		23	
445	7		54	184	22			43				153			8037			339		23	
446	6		78	364	50			46				117			6913			326		21	
447	11		55	456	54			37				101			6158			250		39	
448	7		89	49	42			47				112			7063			328		22	
449	7		70	143	30			48				82			5754			315		25	
450	6		85	105	28			48				128			6901			329		21	
451	6		77	282	30			47				120			6735			324		20	
452	6		66	191	14			45				148			7125			329		21	
453	7		68	78	20			44				127			7153			325		22	
454	7		53	40	78			43				100			7594			353		21	
455	8		47	45	138			39				118			9191			383		24	
456	7		38	137	36			35				158			9570			373		24	
457	8		36	287	125			38				101			10759			385		27	
458	9		20	57	48			28				235			9733			369		30	
459	12		14	83	32			35				175			11103			285		43	
460	9		20	40	72			28				208			9820			356		29	
461	6		82	82	19			47				122			7341			337		20	
462	8		67	67	30			44				133			6500			292		27	
463	7		44	44	133			36				133			8627			348		24	
464	7		43	42	24			40				157			8166			347		24	
465	7		76	122	37			46				125			7775			343		25	
466	6		79	130	102			45				93			7083			344		21	
467	6		77	82	64			43				86			6767			319		22	
468	6		81	69	39			44				128			6452			313		20	
469	7		55	74	48			36				147			7994			320		25	
470	9		27	41	28			36				179			9529			348		32	
471	9		28	26	48			36				172			9546			362		32	
472	7		20	93	25			30				213			9751			383		26	

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475	9		86	5	11			44				99			10542			391		29	
476	8		86	5	29			52				102			9764			395		27	
477	8		83	5	29			47				94			9584			370		23	
478	7		74	6	23			47				135			9404			374		29	
479	7		89	6	116			49				54			9884			386		25	
480	10		71	5	9			49				83			8865			444		34	
481	8		70	5	28			32				122			9105			409		29	
482	8		65	5	28			31				111			9225			422		28	
483	24		41	22	133			43				487			6421			264		17	
484	9		74		21			46				171			9740			401		30	
485	2		79	41	60			25				1124			2924			111		15	
486	3		50	33	40			37				1103			4009			160		19	
487	9		3	3	5			7				15			1592			19		12	
488	13		10	7	17			3				14			1533			30		7	
489	10		115	3	76			31				30			10938			317		34	
490	14		58	4	27			14				16			7953			343		49	
491	24		88	4	10			14				10			9165			270		27	
492	20		24	4	201			12				34			3679			94		32	
493	18		26	3	222			14				40			4675			93		22	
494	7		120	1	53			49				120			7451			447		18	
495	9		64	3	156			45				98			6146			344		35	
496	9		28	2	49			23				185			5423			133		24	
497	9		51	12	159			28				70			5130			271		26	
498										15.20				1.40		20.50	4.00				3.30
499										4.00				-1.00		17.90	4.60				1.90
500										2.70				-1.00		1.80	-2.00				1.50
501										5.60				1.20		1.10	-2.00				3.10
502										3.30				-1.00		4.20	-2.00				2.40
503										3.50				-1.00		0.90	-2.00				2.70
504	13		88	3	70			34				162			12972			427		50	
505	10		52	4	119			42				195			9960			424		38	
506	8		68	4	119			41				182			9764			409		29	
507	8		61	3	139			47				212			12392			531		26	
508	16		28	2	53			31				110			14206			294		73	
509	8		113	2	172			49				100			12658			661		31	
510	6		66	1	116			50				204			6391			269		23	
511	5		119	1	361			47				98			9327			400		13	
512	7		93	2	88			42				185			6403			297		19	
513	8		79	7	47			45				89			8469			363		29	
514	9		81	170	91			44				100			8363			374		27	
515	9		72	11	49			40				138			7929			350		27	
516	9		77	14	47			43				119			8290			369		27	
517	9		83	4	18			46				172			7691			356		28	
518	7		88	3	7			42				110			7255			357		27	
519	7		123	3	32			44				111			7931			358		24	
520	7		105	2	71			48				74			8188			353		24	
521	7		89	2	17			41				81			7576			350		25	
522	11		59	5	45			43				166			9133			358		34	
523	12		60	5	69			38				160			9517			355		38	
524	13		31	4	95			36				150			10076			283		54	
525	16		32	6	77			36				150			10828			284		58	
526	15		23	4	92			38				161			10941			275		70	
527	13		56	4	135			37				149			10238			391		46	
528	14		20	5	76			38				161			10606			228		61	
529	15		30	4	103			35				151			10708			224		59	
530	15		19	6	25			41				164			10890			193		62	
531	10		52	4	119			42				195			9960			424		38	

	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG
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533	8		61	3	139			47				212			12392			531		26	
534	8			4	122							151								28	
535	13		54	2	90			44				322			8382			249		69	
536	14		13	3	51			39				171			10632			237		66	
537	12		29	5	74			41				74			13837			351		40	
538	10		69	5	30			40				94			9524			378		39	
539	14		69	5	136			43				86			12160			503		57	
540	10		69	5	21			44				97			11022			447		38	
541	6		78	2	12			44				107			9386			385		29	
542	12		18					40				85			17014			343		51	
543	6		73		13			43				117			9604			373		34	
544	3		77	22	35			44				376			6881			392		23	
545	12		13	2				37				90			15225			285		53	
546							1.34	46.90		3.59				0.85		0.88			73.20		2.74
547							1.35	42.40		7.38				1.57		2.00			103.00		7.42
548							0.39	48.20		3.88				0.95		0.86			98.30		3.53
549					25.60		3.34	47.20		2.86				0.74					79.70		2.42
550					28.40		0.83	40.80		7.78				1.59		3.03			138.00		5.18
551	5	7	113	17	12	1063	-0.2	50		2		135	-1.0	0		0.30	-2.0	789	51.0	17	1.4
552	28	66	17	5	4	-50	0.6	27		12		298	-1.0	2		12.8	13.5	182	129.0	75	7.6
553	36	65	31	8	4	-50	1.4	42		12		210	-1.0	2		10.4	13.3	449	124.0	91	7.2
554	5	6	122	3	36	1132	-0.2	50		2		141	-1.0	0		0.3	-2.0	799	51.0	18	1.7
555	36	88	22	6	42	-50	-0.2	45		16		210	-1.0	3		13.8	14.3	257	91.0	91	9.3
556	7	13	62	1	14	486	-0.2	36		3		175	1.8	1		2.7	-2.0	310	204.0	22	1.8
557	8	13	72	1	14	570	-0.2	38		4		191	1.9	1		2.0	-2.0	291	410.0	26	2.3
558	7	11	82	1	39	75	0.2	38		3		193	2.0	1		2.4	-2.0	277	345.0	23	1.9
559	9	11	68	1	32	-50	-0.2	49		3		92	-1.0	1		2.8	-2.0	378	192.0	26	2.2
560	14	43	47	1	333	-50	-0.2	35		8		302	1.9	1		4.3	-2.0	329	233.0	46	4.7
561	8		79	7	47			45				89						363		29	
562	16		28	-3	53			31				110						294		73	
563	5		214	2	23			43				128			3097			230		12	
564	4		291	3	34			42				95			3363			237		12	
565			75	7	50			15				205						340		26	
566			120	3	42			15				292						330		25	
567			53	3	49			35				166						320		21	
568			58	18	85			25				139						405		27	
569			45	4	39			10				167						505		38	
570			48	2	36			20				137						505		38	
571			100	2	24			20				181						265		23	
572			53	6	47			20				125						475		33	
573			70	8	47			15				144						370		32	
574			65	7	17			25				177						360		37	
575			115	9	139			25				91						255		28	
576			70	7	17			20				175						550		81	
577			170	8	19			10				132						270		19	
578			68	2	8			30				219						380		31	
579			133	2	10			15				139						315		16	
580			93	4	47			15				115						305		16	
581			98	3	75			20				219						225		15	
582			100	2	31			20				176						340		19	
583			40	5	21			20				152						470		32	
584			65	2	6			20				76						350		25	
585			103	2	9			20				123						390		30	
586			65	2	6			20				76						350		25	
587			105	5	74			20				169						760		19	
588			110	2	34			15				170						355		26	
589			108	8	130			15				202						300		26	
590			50	2	46			5				141						450		50	

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592			73	4	41			20				133						470		47	
593			88	7	38			15				133						420		48	
594			103	4	75			30				216						325		21	
595			100	5	31			15				157						350		22	
596			88	8	65			15				180						295		21	
597			95	4	108			20				190						320		23	
598			110	7	109			15				225						380		26	
599			133	2	74							254						375		24	
600			70	22	68							207						395		44	
601			85	2	72			20				144						385		26	
602			95	6	30			25				141						770		25	
603	7		95		15			48				191			13085			588		23	
604	7		93	3	16			46				201			12431			526		23	
605	7		93	6	18			20				328			3254			77		12	
606	8		82	5	91			48				95						402		31	
607	9		89	1	26			45				136						419		31	
608	7		63	2	20			47				188						361		24	
609	11		104	2	24			44				163						402		35	
610	7		86	12	46			47				187						319		24	
611	10		66	2	22			51				106						437		38	
612	9		56	5	30			42				158						337		28	
613	7		77	2	18			48				151						330		24	
614	36		54	3	10			54				137						181		81	
615	9		56	7	74			45				146						362		32	
616	7	12	45	1	10	882		36		12		137	0.7	0.6		2.0		308		21	1.7
617	10	36	20	50	6	22		32		36		49	1.9	0.8		6.0		106		28	2.6
618	12	32	78	4	38	8		46		32		70	1.3	0.8		4.2		235		28	2.4
619	17	59	47	17	15			28		59		97	1.3	1.1		8.7		108		36	3.5
620	7	10	41	1	9	851		17		10		171	1.7	0.4		3.4		105		16	1.5
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787	RB	S	SB	SC	SE	SM	SN	SR	TA	TB	TE	TH	TL	TM	U	V	W	Y	YB	ZN	ZR
788	172	720	0	10	-1	0	2	73	-2	0	0	21	0	0	6	63	0	33	0	34	216
789	209	16440	0	10	-1	0	3	22	-2	0	0	21	0	0	7	64	0	35	0	78	170
790	128	3850	0	9	2	0	2	48	-2	0	0	19	0	0	16	171	0	34	0	11	172
791	23	-10	0	47	-1	0	-1	38	-2	0	0	-2	0	0	2	269	0	22	0	29	82
792	48	310	0	8	-1	0	5	45	-2	0	0	14	0	0	4	177	0	22	0	160	116
793	192	600	0	7	-1	0	4	159	-2	0	0	50	0	0	18.5	41	4	42	0	9	224
794	3	0	0	15	0	0	3	9	0	0	0	14	0	0	4	58	0	24	0	9	169
795	204	0	0	4	0	0	-2	60	0	0	0	38	0	0	12	5	0	47	0	11	171
796	167	230	0	16	3	0	3	28	-2	0	0	21	0	0	12.5	87	0	41	0	5	166
797	125	170	0	8	-1	0	2	104	-2	0	0	17	0	0	4.5	44	0	25	0	35	259
798	216	80	0	11	-1	0	4	49	-2	0	0	22	0	0	6	81	0	48	0	31	283
799	163	16800	0	13	-1	0	2	59	-2	0	0	16	0	0	6	63	0	42	0	45	199
800	6	1150	0	45	-1	0	2	32	-2	0	0	2	0	0	1.5	467	0	36	0	67	132
801	153	690	0	13	7	0	5	12	-2	0	0	19	0	0	5.5	135	0	37	0	37	232
802	131	600	0	9	-1	0	2	59	-2	0	0	18	0	0	5.5	55	0	25	0	17	203
803	24	50	0	3	-1	0	-2	231	-2	0	0	6	0	0	38	7	0	46	0	14	65
804	324	-3	0	5	-1	0	3	11	6	0	0	68	0	0	7	17	0	44	0	2	234
805	176	-3	0	4	-1	0	7	13	4	0	0	69	0	0	3	23	0	40	0	2	238
806	81	-3	0	5	-1	0	2	65	5	0	0	69	0	0	16	25	0	42	0	6	304
807	164	48	0	10	0	0	-2	166	0	0	0	58	0	0	5.5	37	3	49	0	22	518
808	204	45	0	6	0	0	2	18	0	0	0	27	0	0	13	24	5	43	0	3	464
809	229	33	0	9	0	0	2	106	0	0	0	50	0	0	13	10	4	49	0	11	194
810	2	522	0	50	0	0	-2	157	0	0	0	1	0	0	-0.5	402	-2	24	0	91	90
811	6	57	0	16	0	0	2	29	0	0	0	7	0	0	1	26	37	10	0	4	236
812	238	65	0	5	0	0	-2	114	0	0	0	62	0	0	13	15	2	19	0	9	110
813	190	91	0	11	0	0	3	112	0	0	0	59	0	0	6.5	63	2	26	0	27	252
814	205	29	0	5	0	0	3	129	0	0	0	19	0	0	4.5	32	5	19	0	18	280
815	155	0	0	5	0	0	3	239	0	0	0	40	0	0	10	39	0	47	0	21	343
816	4	0	0	0	0	0	0	140	0	0	0	0	0	0	0	0	0	11	0	90	40
817	280	0	0	0	0	0	0	85	0	0	0	0	0	0	0	0	0	50	0	15	250
818	30	0	0	4	0	0	-2	177	0	0	0	35	0	0	9	36	0	7	0	5	173
819	61	99	0	7	0	0	5	157	0	0	0	58	0	0	11	13	6	47	0	10	186
820	90	1150	0	0	0	0	0	47	0	0	0	0	0	0	0	80	0	19	0	5	145
821	22	0	0	0	0	0	6	60	0	0	0	65	0	0	55	30	0	26	0	23	160
822	4	0	0	-2	0	0	6	17	0	0	0	38	0	0	5	-2	0	139	0	4	582
823	233	0	0	4	0	0	-2	150	0	0	0	53	0	0	11	36	0	45	0	13	268
824	37	5220	0	32	-1	0	1	39	-2	0	0	6	0	0	3.5	288	0	27	0	132	162
825	222	300	0	17	-1	0	5	24	-2	0	0	37	0	0	9.5	101	0	51	0	17	147

	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG
826	179	20	0	14	-1	0	3	26	2	0	0	18	0	0	6.5	109	0	30	0	9	163
827	96	1630	0	9	-1	0	2	38	-2	0	0	16	0	0	4.5	78	0	32	0	39	199
828	233	80	0	5	-1	0	4	97	4	0	0	61	0	0	17	17	0	50	0	7	183
829	84	-3	0	5	-1	0	3	38	3	0	0	70	0	0	19	15	0	48	0	2	244
830	20	0	0	0	0	0	-2	150	0	0	0	-4	0	0	4	140	0	18	0	30	95
831	64	0	0	4	0	0	-2	95	0	0	0	35	0	0	9	36	0	21	0	10	161
832	67	40	0	42	-1	0	2	105	-2	0	0	3	0	0	1	333	0	29	0	84	86
833	171	90	0	12	-1	0	4	39	-2	0	0	24	0	0	6	79	0	35	0	39	180
834	112	20	0	7	-1	0	2	26	-2	0	0	19	0	0	5.5	54	0	25	0	17	150
835	40	1370	0	8	-1	0	-1	37	-2	0	0	15	0	0	5	42	0	34	0	24	206
836	100	20	0	6	-1	0	1	38	-2	0	0	14	0	0	5	40	0	20	0	13	392
837	200	1330	0	12	-1	0	4	52	-2	0	0	23	0	0	7.5	95	0	40	0	41	165
838	157	110	0	9	-1	0	2	60	3	0	0	19	0	0	3.5	51	0	31	0	22	164
839	26	20	0	5	-1	0	-1	45	-2	0	0	17	0	0	3.5	21	0	33	0	30	162
840	280	290	0	17	-1	0	4	44	-2	0	0	17	0	0	5	34	0	45	0	62	237
841	97	110	0	4	-1	0	-2	64	-2	0	0	12	0	0	4.5	22	0	19	0	4	201
842	248	240	0	11	1	0	2	128	2	0	0	10	0	0	5.5	119	0	17	0	44	172
843	173	232	0	9	0	0	-2	52	0	0	0	17	0	0	4.5	42	3	25	0	429	170
844	80	94	0	9	0	0	-2	205	0	0	0	25	0	0	4.5	36	3	34	0	8	149
845	55	65	0	3	0	0	6	97	0	0	0	75	0	0	21	15	5	50	0	7	219
846	75	990	0	28	0	0	2	299	0	0	0	16	0	0	3	210	2	41	0	71	289
847	17	22	0	16	0	0	8	77	0	0	0	40	0	0	12	63	6	75	0	22	145
848	163	319	0	8	-1	0	3	147	0	0	0	41	0	0	9	37	5	60	0	14	404
849	19	1542	0	47	0	0	-2	269	0	0	0	1	0	0	-0.5	316	-2	18	0	76	56
850	67	23	0	3	0	0	-2	30	0	0	0	10	0	0	4	18	4	14	0	12	336
851	51	166	0	3	0	0	-2	490	0	0	0	10	0	0	6	9	-2	5	0	21	108
852	264	50	0	6	0	0	2	88	0	0	0	93	0	0	16	16	4	32	0	7	190
853	-10	450	0	48	0	0	0	84	0	0	0	0	0	0	0	700	0	40	0	25	120
854	120	450	0	0	0	0	0	60	0	0	0	0	0	0	0	100	0	52	0	45	155
855	211	180	0	3	0	0	3	58	0	0	0	68	0	0	27	13	4	36	0	16	182
856	10	300	0	44	0	0	0	220	0	0	0	0	0	0	0	310	0	32	0	25	-100
857	-10	250	0	33	0	0	0	170	0	0	0	0	0	0	0	530	0	35	0	40	-100
858	26	0	0	0	0	0	0	120	0	0	0	0	0	0	0	0	0	34	0	33	150
859	50	300	0	47	0	0	0	98	0	0	0	0	0	0	0	540	0	33	0	10	100
860	280	0	0	0	0	0	0	46	0	0	0	0	0	0	0	0	0	36	0	124	210
861	193	0	0	2	0	0	-2	221	0	0	0	35	0	0	10	29	0	35	0	22	184
862	164	30	0	8	-1	0	3	23	2	0	0	22	0	0	7	71	0	29	0	7	207
863	217	30	0	12	-1	0	3	38	-2	0	0	30	0	0	9.5	92	0	37	0	44	253
864	220	40	0	8	-1	0	3	27	-2	0	0	21	0	0	6	56	0	51	0	15	236
865	54	3200	0	40	-1	0	1	69	-2	0	0	11	0	0	6	409	0	36	0	183	141
866	146	50	0	9	-1	0	3	42	-2	0	0	20	0	0	6	79	0	43	0	12	232
867	136	130	0	-1	-1	0	-2	107	-2	0	0	14	0	0	2	10	0	45	0	13	128
868	24	0	0	47	0	0	2	113	0	0	0	-1	0	0	1	504	0	41	0	20	89
869	110	0	0	15	0	0	3	381	0	0	0	21	0	0	3	141	0	37	0	53	240
870	191	10	0	16	-1	0	3	24	-2	0	0	19	0	0	7	107	0	31	0	9	214
871	31	260	0	35	-1	0	-1	102	-2	0	0	9	0	0	2	293	0	27	0	129	140
872	157	40	0	10	-1	0	3	41	-2	0	0	22	0	0	6.5	90	0	33	0	17	230
873	254	30	0	15	-1	0	4	22	-2	0	0	25	0	0	9	80	0	45	0	8	168
874	69	120	0	8	-1	0	1	51	-2	0	0	13	0	0	4.5	78	0	25	0	13	163
875	132	10	0	9	-1	0	4	25	-2	0	0	19	0	0	5	78	0	58	0	18	232
876	50	120	0	33	-1	0	-1	81	-2	0	0	7	0	0	2.5	284	0	28	0	49	118
877	161	810	0	10	-1	0	3	42	-2	0	0	22	0	0	8	75	0	34	0	15	177
878	16	190	0	7	-1	0	3	150	4	0	0	60	0	0	9	30	0	68	0	6	239
879	129	150	0	5	2	0	-2	67	4	0	0	6	0	0	11	176	0	26	0	506	-1
880	14	72	0	8	0	0	-2	98	0	0	0	75	0	0	9	25	4	51	0	4	221
881	17	21	0	3	0	0	-2	505	0	0	0	6	0	0	2.5	22	-2	6	0	10	119
882	282	36	0	5	0	0	-2	99	0	0	0	92	0	0	25	20	2	27	0	19	250
883	244	339	0	6	0	0	4	90	0	0	0	61	0	0	16	25	3	42	0	14	238
884	124	87	0	10	0	0	3	129	0	0	0	23	0	0	4.5	15	4	64	0	19	214

	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG
885	16	51	0	46	0	0	-2	43	0	0	0	1	0	0	-0.5	468	-2	33	0	32	102
886	7	68	0	50	0	0	-2	65	0	0	0	1	0	0	0.5	475	-2	31	0	317	97
887	4	159	0	-3	0	0	-2	3	0	0	0	3	0	0	-0.5	-2	4	7	0	7	34
888	146	330	0	7	0	0	-2	119	0	0	0	77	0	0	8.5	34	3	38	0	13	360
889	9	0	0	46	0	0	-2	113	0	0	0	-1	0	0	0.5	423	0	35	0	61	91
890	73	126	0	6	0	0	2	112	0	0	0	44	0	0	9	36	5	47	0	17	254
891	12	0	0	0	0	0	5	50	0	0	0	4	0	0	16	-20	0	26	0	75	190
892	336	0	0	-2	0	0	-2	32	0	0	0	69	0	0	27	5	0	33	0	15	132
893	16	0	0	0	0	0	22	60	0	0	0	-4	0	0	6	290	0	36	0	18	120
894	68	838	0	34	0	0	0	207	0	0	0	6	0	0	2.5	395	0	44	0	250	240
895	13	0	0	0	0	0	-2	100	0	0	0	-4	0	0	4	290	0	65	0	12	330
896	30	850	0	38	0	0	0	230	0	0	0	0	0	0	0	260	0	27	0	20	-100
897	10	250	0	43	0	0	0	-30	0	0	0	0	0	0	0	450	0	37	0	25	100
898	315	0	0	-2	0	0	-2	28	0	0	0	71	0	0	31	7	0	34	0	16	131
899	37	20	0	10	-1	0	-1	28	-2	0	0	17	0	0	4	85	0	41	0	19	213
900	17	100	0	48	-1	0	-1	116	-2	0	0	-2	0	0	2	292	0	17	0	77	47
901	53	610	0	42	-1	0	1	110	-2	0	0	-2	0	0	1.5	380	0	29	0	91	84
902	197	240	0	13	-1	0	4	20	-2	0	0	23	0	0	6.5	89	0	53	0	25	136
903	233	20	0	25	-1	0	5	25	-2	0	0	31	0	0	9	146	0	49	0	11	367
904	140	69	0	15	0	0	-2	206	0	0	0	38	0	0	9	62	2	68	0	12	610
905	383	0	0	-2	0	0	5	21	0	0	0	26	0	0	16	8	0	28	0	14	71
906	130	20	0	6	-1	0	2	50	-2	0	0	18	0	0	3.5	41	0	24	0	35	253
907	211	20	0	13	-1	0	4	44	-2	0	0	27	0	0	5.5	80	0	39	0	33	154
908	60	110	0	12	-1	0	2	80	-2	0	0	15	0	0	4	127	0	41	0	30	222
909	191	140	0	12	-1	0	3	35	-2	0	0	22	0	0	6	81	0	32	0	11	152
910	289	180	0	43	-1	0	5	62	-2	0	0	-2	0	0	8	460	0	40	0	26	89
911	77	30	0	7	-1	0	2	29	-2	0	0	17	0	0	4.5	53	0	21	0	13	166
912	264	30	0	43	-1	0	2	69	2	0	0	2	0	0	3	313	0	24	0	74	63
913	99	470	0	39	-1	0	2	76	-2	0	0	4	0	0	3	353	0	33	0	62	106
914	152	7760	0	12	-1	0	2	56	-2	0	0	26	0	0	5.5	97	0	37	0	58	213
915	126	50	0	11	-1	0	2	47	-2	0	0	24	0	0	6	63	0	67	0	17	200
916	25	170	0	33	1	0	1	77	-2	0	0	10	0	0	3	415	0	32	0	65	166
917	136	10	0	11	-1	0	3	28	-2	0	0	23	0	0	5.5	77	0	33	0	7	177
918	41	350	0	36	-1	0	1	119	-2	0	0	6	0	0	1.5	331	0	35	0	81	121
919	95	50	0	14	1	0	4	322	-2	0	0	20	0	0	4	99	0	43	0	47	356
920	37	-10	0	0	-1	0	-2	29	-2	0	0	16	0	0	3	0	0	35	0	-1	190
921	68	20	0	2	-1	0	-2	14	-2	0	0	13	0	0	1	13	0	15	0	16	167
922	123	91	0	5	0	0	-2	73	0	0	0	19	0	0	3	45	2	19	0	87	170
923	3	18	0	10	0	0	-2	100	0	0	0	9	0	0	0.5	15	4	64	0	10	225
924	22	62	0	5	0	0	-2	43	0	0	0	9	0	0	2.5	22	17	15	0	13	361
925	190	194	0	10	0	0	-2	7	0	0	0	16	0	0	19	176	7	34	0	3	192
926	4	950	0	58	0	0	-2	112	0	0	0	1	0	0	-0.5	218	-2	14	0	61	36
927	50	53	0	13	0	0	4	76	0	0	0	39	0	0	11	71	6	96	0	5	604
928	110	41	0	27	0	0	4	165	0	0	0	18	0	0	3.5	88	5	49	0	68	230
929	9	156	0	59	0	0	-2	106	0	0	0	-1	0	0	0.5	329	-2	16	0	87	42
930	5	67	0	39	0	0	3	33	0	0	0	3	0	0	0.5	29	3	79	0	158	242
931	82	519	0	16	0	0	-2	332	0	0	0	11	0	0	1.5	63	4	50	0	30	503
932	51	63	0	8	0	0	6	100	0	0	0	79	0	0	20	25	3	51	0	8	221
933	186	32	0	4	0	0	-2	147	0	0	0	20	0	0	27	13	-2	13	0	8	106
934	172	308	0	10	0	0	2	112	0	0	0	53	0	0	4.5	29	-2	40	0	29	272
935	272	25	0	7	0	0	2	112	0	0	0	65	0	0	14	21	3	44	0	23	221
936	97	0	0	14	0	0	2	181	0	0	0	32	0	0	8	150	0	50	0	32	352
937	9	0	0	0	0	0	0	620	0	0	0	0	0	0	0	0	0	50	0	35	270
938	266	0	0	4	0	0	5	113	0	0	0	37	0	0	13	25	0	42	0	16	208
939	220	0	0	0	0	0	-2	120	0	0	0	50	0	0	18	50	0	42	0	8	260
940	10	400	0	62	0	0	0	-30	0	0	0	0	0	0	0	540	0	41	0	70	125
941	280	0	0	2	0	0	2	106	0	0	0	80	0	0	16	12	0	22	0	21	216
942	100	0	0	0	0	0	-2	180	0	0	0	4	0	0	-4	50	0	60	0	22	280
943	107	120	0	8	-1	0	3	50	-2	0	0	21	0	0	5.5	57	0	25	0	12	172

	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG
944	170	50	0	12	-1	0	3	40	-2	0	0	19	0	0	3.5	83	0	49	0	18	214
945	36	60	0	29	-1	0	2	56	-2	0	0	4	0	0	4.5	407	0	50	0	126	144
946	190	140	0	6	-1	0	3	50	-2	0	0	22	0	0	5.5	42	0	44	0	8	167
947	97	0	0	18	0	0	2	144	0	0	0	8	0	0	1	15	0	40	0	51	215
948	256	40	0	15	-1	0	6	29	-2	0	0	31	0	0	7	97	0	46	0	33	169
949	213	30	0	15	-1	0	3	49	2	0	0	20	0	0	7.5	105	0	38	0	42	159
950	161	60	0	10	-1	0	2	32	-2	0	0	19	0	0	6	63	0	28	0	14	195
951	10	660	0	47	-1	0	1	39	-2	0	0	-2	0	0	0.5	461	0	31	0	75	88
952	194	40	0	8	-1	0	2	52	-2	0	0	12	0	0	5	78	0	30	0	35	170
953	74	5010	0	9	-1	0	2	33	-2	0	0	11	0	0	6	106	0	30	0	213	167
954	43	80	0	2	-1	0	-1	31	-2	0	0	9	0	0	3.5	21	0	9	0	8	89
955	18	90	0	41	-1	0	1	122	-2	0	0	3	0	0	2	396	0	32	0	70	122
956	159	90	0	6	-1	0	3	109	9	0	0	66	0	0	13	37	0	49	0	3	228
957	213	90	0	2	-1	0	6	115	-2	0	0	135	0	0	10	14	0	62	0	12	237
958	283	120	0	7	-1	0	5	87	4	0	0	44	0	0	15	25	0	63	0	16	253
959	5	10	0	17	-1	0	-2	41	-2	0	0	18	0	0	1.5	41	0	59	0	17	248
960	2	3417	0	49	0	0	2	167	0	0	0	3	0	0	-0.5	464	-2	30	0	107	106
961	3	41	0	41	-0.5	0	-2	29	0	0	0	-1	0	0	0.5	486	-2	47	0	49	101
962	164	403	0	9	0	0	2	171	0	0	0	52	0	0	6.5	40	4	54	0	19	329
963	139	34	0	5	0	0	-2	27	0	0	0	70	0	0	25	14	3	33	0	-2	159
964	53	84	0	6	0	0	-2	36	0	0	0	15	0	0	3	24	4	17	0	9	161
965	7	621	0	-3	0	0	-2	2	0	0	0	3	0	0	1.5	2	3	9	0	21	59
966	610	50	0	2	-0.5	0	-2	11	0	0	0	32	0	0	3	27	13	8	0	3	227
967	5	67	0	55	0	0	2	37	0	0	0	1	0	0	-0.5	566	2	53	0	218	131
968	242	188	0	3	0	0	3	38	0	0	0	67	0	0	23	17	3	30	0	6	193
969	43	62	0	4	0	0	-2	21	0	0	0	13	0	0	2	21	2	15	0	24	139
970	132	68	0	-3	0	0	-2	39	0	0	0	68	0	0	5	-3	2	14	0	6	101
971	2	237	0	54	0	0	-2	154	0	0	0	-1	0	0	-0.5	381	-2	25	0	83	69
972	11	79	0	28	-0.5	0	-2	29	0	0	0	2	0	0	1	254	9	41	0	33	129
973	200	0	0	0	0	0	-2	160	0	0	0	46	0	0	16	50	0	34	0	8	270
974	7	0	0	0	0	0	7	540	0	0	0	-4	0	0	4	40	0	48	0	18	220
975	15	97	0	-2	0	0	5	196	0	0	0	53	0	0	10	59	5	53	0	7	323
976	24	0	0	0	0	0	8	95	0	0	0	-4	0	0	4	360	0	28	0	15	140
977	112	0	0	13	0	0	4	133	0	0	0	21	0	0	2	124	0	52	0	82	256
978	10	150	0	22	0	0	0	120	0	0	0	0	0	0	0	210	0	30	0	30	230
979	201	0	0	9	0	0	6	87	0	0	0	27	0	0	6	30	0	37	0	44	420
980	65	598	0	47	0	0	0	180	0	0	0	2	0	0	1.5	295	0	21	0	112	70
981	127	0	0	20	0	0	-2	533	0	0	0	19	0	0	3	253	0	38	0	73	321
982	7	0	0	0	0	0	0	300	0	0	0	0	0	0	0	0	0	26	0	196	80
983	10	400	0	43	0	0	0	86	0	0	0	0	0	0	0	540	0	41	0	100	120
984	288	628	0	7	0	0	3	40	0	0	0	54	0	0	18	31	7	50	0	4	218
985	186	531	0	7	0	0	2	74	0	0	0	49	0	0	18	28	5	41	0	5	216
986	38	0	0	-2	0	0	-2	660	0	0	0	6	0	0	1	6	0	6	0	11	100
987	109	308	0	39	0	0	0	225	0	0	0	3	0	0	0.5	380	0	26	0	98	116
988	132	0	0	3	0	0	-2	134	0	0	0	72	0	0	19	15	0	38	0	10	168
989	34	110	0	38	-1	0	1	101	-2	0	0	8	0	0	2	316	0	28	0	70	128
990	177	70	0	7	-1	0	3	38	-2	0	0	22	0	0	5.5	32	0	59	0	40	257
991	136	50	0	8	-1	0	3	31	-2	0	0	20	0	0	6	55	0	24	0	30	175
992	41	560	0	41	-1	0	2	39	-2	0	0	-2	0	0	3	526	0	45	0	197	130
993	63	270	0	43	-1	0	1	89	-2	0	0	-2	0	0	2	399	0	30	0	64	75
994	133	50	0	10	-1	0	3	34	-2	0	0	16	0	0	4.5	137	0	38	0	19	218
995	200	360	0	10	-1	0	4	33	-2	0	0	24	0	0	7	87	0	38	0	19	172
996	121	10	0	7	-1	0	2	32	-2	0	0	12	0	0	3.5	58	0	24	0	14	178
997	179	-10	0	12	-1	0	3	34	-2	0	0	22	0	0	6	66	0	51	0	8	260
998	11	70	0	50	-1	0	-1	130	-2	0	0	-2	0	0	-0.5	348	0	23	0	91	64
999	46	360	0	34	-1	0	5	49	-2	0	0	9	0	0	3.5	205	0	40	0	156	149
1000	4	-3	0	8	-1	0	-2	21	5	0	0	43	0	0	3	16	0	51	0	6	227
1001	92	33	0	-3	0	0	3	12	0	0	0	76	0	0	19	4	3	27	0	2	189
1002	231	98	0	-3	0	0	-2	90	0	0	0	63	0	0	13	12	2	18	0	10	106

	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG
1003	56	123	0	13	0	0	-2	281	0	0	0	41	0	0	5	65	2	51	0	20	335
1004	49	59	0	4	0	0	-2	681	0	0	0	9	0	0	2.5	27	-2	6	0	12	174
1005	4	425	0	58	0	0	-2	112	0	0	0	1	0	0	-0.5	275	-2	12	0	66	30
1006	180	60	0	8	0	0	3	67	0	0	0	19	0	0	3.5	51	2	23	0	59	190
1007	8	56	0	11	0	0	2	53	0	0	0	15	0	0	3	36	2	22	0	26	160
1008	18	80	0	51	0	0	-2	120	0	0	0	1	0	0	0.5	470	-2	34	0	141	100
1009	2	935	0	13	0	0	66	7	0	0	0	-1	0	0	11	142	0	132	0	154	4
1010	248	65	0	6	0	0	-2	89	0	0	0	46	0	0	12	32	-2	34	0	20	237
1011	450	25	0	3	0	0	-2	21	0	0	0	15	0	0	4.5	5	2	15	0	-2	143
1012	79	35	0	11	-1	0	5	190	0	0	0	38	0	0	8	52	5	60	0	19	509
1013	23	0	0	12	0	0	3	155	0	0	0	50	0	0	7	49	0	76	0	16	399
1014	160	0	0	4	0	0	-2	162	0	0	0	102	0	0	7	26	0	59	0	12	320
1015	5	0	0	0	0	0	0	440	0	0	0	0	0	0	0	0	0	14	0	51	110
1016	-10	300	0	37	0	0	0	37	0	0	0	0	0	0	0	400	0	40	0	25	110
1017	74	290	0	40	0	0	0	254	0	0	0	2	0	0	0.5	375	0	24	0	124	111
1018	12	0	0	0	0	0	0	50	0	0	0	0	0	0	0	0	0	38	0	24	190
1019	49	0	0	20	0	0	-2	681	0	0	0	28	0	0	4	258	0	31	0	34	121
1020	241	146	0	6	0	0	2	130	0	0	0	52	0	0	13	32	4	48	0	26	263
1021	85	0	0	0	0	0	-2	70	0	0	0	-4	0	0	6	110	0	38	0	32	170
1022	87	0	0	-2	0	0	7	16	0	0	0	37	0	0	1	5	0	45	0	4	113
1023	21	500	0	45	1	0	1	116	-2	0	0	-2	0	0	2	406	0	27	0	113	80
1024	283	30	0	16	-1	0	4	73	-2	0	0	26	0	0	7	90	0	44	0	8	149
1025	35	4630	0	6	-1	0	-1	40	-2	0	0	14	0	0	5	54	0	33	0	72	266
1026	83	160	0	5	-1	0	1	35	-2	0	0	25	0	0	7.5	23	0	48	0	11	240
1027	188	130	0	10	-1	0	3	35	-2	0	0	19	0	0	3	81	0	39	0	26	223
1028	120	0	0	0	0	0	-2	130	0	0	0	32	0	0	8	30	0	12	0	8	170
1029	298	241	0	4	0	0	3	74	0	0	0	65	0	0	9.5	15	5	69	0	14	356
1030	228	30	0	30	-1	0	2	37	-2	0	0	16	0	0	4.5	233	0	41	0	24	170
1031	61	2770	0	21	-1	0	1	78	-2	0	0	9	0	0	4	177	0	28	0	84	155
1032	32	3050	0	28	-1	0	1	105	-2	0	0	8	0	0	4	324	0	30	0	77	157
1033	145	30	0	6	-1	0	3	68	-2	0	0	23	0	0	6.5	25	0	48	0	13	280
1034	151	2810	0	19	-1	0	2	253	-2	0	0	13	0	0	9	97	0	24	0	186	124
1035	15	210	0	44	-1	0	1	131	-2	0	0	3	0	0	1.5	434	0	30	0	83	116
1036	30	180	0	38	-1	0	1	82	-2	0	0	5	0	0	6.5	365	0	22	0	61	105
1037	133	30	0	6	-1	0	2	47	-2	0	0	20	0	0	5.5	51	0	26	0	20	192
1038	67	10	0	3	-1	0	-2	43	3	0	0	9	0	0	3.5	35	0	15	0	6	259
1039	9	10	0	5	-1	0	-2	41	-2	0	0	14	0	0	3.5	17	0	27	0	6	210
1040	406	61	0	6	0	0	-2	15	0	0	0	29	0	0	6	38	6	41	0	2	306
1041	14	46	0	53	0	0	-2	307	0	0	0	2	0	0	-0.5	363	-2	21	0	53	70
1042	29	52	0	9	0	0	3	145	0	0	0	20	0	0	4	30	5	47	0	81	254
1043	16	93	0	3	0	0	-2	489	0	0	0	6	0	0	48	27	-2	4	0	7	115
1044	81	21	0	3	-0.5	0	-2	158	0	0	0	1	0	0	1.5	10	2	7	0	14	51
1045	215	59	0	5	0	0	5	86	0	0	0	90	0	0	13	20	4	47	0	8	267
1046	6	23	0	51	0	0	-2	93	0	0	0	1	0	0	-0.5	655	-2	51	0	43	159
1047	132	889	0	16	0	0	3	235	0	0	0	42	0	0	9	103	3	57	0	31	372
1048	20	23	0	18	0	0	8	73	0	0	0	38	0	0	11	74	5	67	0	26	145
1049	201	68	0	7	0	0	2	156	0	0	0	70	0	0	8	34	3	36	0	10	184
1050	319	171	0	11	0	0	8	131	0	0	0	44	0	0	9	49	4	57	0	13	417
1051	215	97	0	5	0	0	3	91	0	0	0	99	0	0	21	23	5	46	0	11	243
1052	165	30	0	-3	0	0	-2	13	0	0	0	2	0	0	0.5	14	3	9	0	3	67
1053	101	110	0	9	0	0	-2	214	0	0	0	90	0	0	5	36	4	64	0	16	331
1054	10	250	0	47	0	0	0	105	0	0	0	0	0	0	0	490	0	34	0	10	160
1055	39	182	0	8	0	0	2	128	0	0	0	49	0	0	10	37	5	52	0	16	290
1056	196	50	0	7	0	0	3	154	0	0	0	54	0	0	16	39	3	43	0	10	206
1057	20	0	0	44	0	0	0	420	0	0	0	0	0	0	0	320	0	30	0	25	100
1058	30	0	0	4	0	0	-2	74	0	0	0	116	0	0	8	41	0	58	0	5	419
1059	75	0	0	5	0	0	2	120	0	0	0	67	0	0	10	10	0	40	0	11	270
1060	175	500	0	8	-1	0	2	30	-2	0	0	18	0	0	6.5	64	0	38	0	15	259
1061	264	50	0	11	-1	0	4	22	-2	0	0	27	0	0	5.5	79	0	61	0	25	205

	BM	BN	BO	BP	BQ	BR	BS	BT	BU	BV	BW	BX	BY	BZ	CA	CB	CC	CD	CE	CF	CG
1062	23	50	0	43	-1	0	1	148	-2	0	0	-2	0	0	-0.5	496	0	39	0	162	129
1063	18	45	0	11	0	0	5	61	0	0	0	34	0	0	7	41	4	79	0	4	596
1064	19	400	0	47	-1	0	-1	119	-2	0	0	6	0	0	2.5	343	0	24	0	104	80
1065	212	740	0	12	-1	0	3	41	-2	0	0	21	0	0	8.5	82	0	38	0	21	165
1066	135	60	0	12	-1	0	2	51	-2	0	0	14	0	0	3.5	104	0	36	0	18	202
1067	24	30	0	40	-1	0	1	154	-2	0	0	3	0	0	1.5	382	0	28	0	99	91
1068	97	20	0	5	-1	0	-2	48	-2	0	0	21	0	0	3	45	0	16	0	14	162
1069	11	60	0	3	-1	0	-2	15	-2	0	0	15	0	0	2.5	14	0	17	0	-1	171
1070	180	130	0	9	-1	0	3	120	-2	0	0	64	0	0	4	67	0	28	0	24	284
1071	458	-3	0	1	-1	0	2	14	6	0	0	97	0	0	7	12	0	46	0	1	190
1072	195	-3	0	6	-1	0	3	7	6	0	0	78	0	0	6	15	0	47	0	2	243
1073	6	614	0	-3	0	0	-2	17	0	0	0	9	0	0	3.5	8	7	19	0	20	408
1074	2	30	0	4	0	0	-2	59	0	0	0	2	0	0	2	15	2	3	0	3	73
1075	89	1227	0	27	0	0	2	298	0	0	0	16	0	0	1	208	-2	50	0	62	356
1076	48	40	0	6	0	0	-2	372	0	0	0	14	0	0	5	28	2	11	0	13	886
1077	14	249	0	48	0	0	-2	169	0	0	0	1	0	0	-0.5	320	-2	18	0	81	56
1078	1	25	0	7	0	0	3	10	0	0	0	66	0	0	16	13	2	53	0	2	182
1079	13	26	0	4	0	0	-2	359	0	0	0	9	0	0	4.5	15	-2	5	0	2	115
1080	209	219	0	10	0	0	4	36	0	0	0	17	0	0	3	51	-2	23	0	396	157
1081	563	127	0	6	0	0	-2	27	0	0	0	46	0	0	8	3	4	35	0	3	202
1082	149	31	0	-3	0	0	-2	63	0	0	0	97	0	0	16	7	3	41	0	9	161
1083	-1	275	0	-3	0	0	-2	-1	0	0	0	-1	0	0	4	469	10	4	0	12	4
1084	10	1650	0	33	0	0	0	130	0	0	0	0	0	0	0	260	0	26	0	5	-100
1085	10	300	0	43	0	0	0	100	0	0	0	0	0	0	0	540	0	46	0	50	190
1086	80	300	0	43	0	0	0	130	0	0	0	0	0	0	0	650	0	41	0	100	160
1087	207	26	0	7	0	0	2	88	0	0	0	54	0	0	5.5	26	4	30	0	26	240
1088	233	0	0	6	0	0	5	69	0	0	0	44	0	0	8	45	0	45	0	41	292
1089	13	0	0	0	0	0	10	46	0	0	0	4	0	0	16	30	0	36	0	5	210
1090	183	0	0	5	0	0	4	157	0	0	0	57	0	0	10	35	0	35	0	10	171
1091	5	0	0	0	0	0	10	380	0	0	0	4	0	0	6	70	0	28	0	51	330
1092	200	0	0	-2	0	0	2	30	0	0	0	79	0	0	18	3	0	12	0	18	150
1093	265	0	0	10	0	0	7	55	0	0	0	29	0	0	5	81	0	72	0	74	458

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328	1106	139
329	1941	328
330	1908	204
331	161	119
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336	125	90
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338	242	78
339	124	89
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343	333	87
344	127	110
345	140	161
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350	130	101
351	279	91
352	110	90
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354	329	136

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360	131	180
361	169	185
362	515	203
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453	202	71
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455	319	84
456	216	85
457	627	101
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459	251	158
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461	206	59
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463	267	85
464	311	83
465	287	76
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472	942	97

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475	14	97
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482	103	95
483	85	57
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488	13	135
489	6	126
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491	3	248
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495	10	77
496	0	124
497	0	78
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504	17	148
505	55	110
506	85	91
507	28	79
508	17	133
509	26	94
510	22	50
511	26	91
512	23	62
513	123	99
514	331	96
515	112	91
516	139	98
517	97	95
518	44	75
519	81	79
520	43	78
521	45	78
522	17	116
523	17	122
524	15	134
525	20	140
526	15	139
527	16	132
528	12	137
529	12	137
530	9	139
531	55	111

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532	85	91
533	28	79
534		76
535	30	102
536	13	95
537	52	141
538	38	119
539	51	134
540	78	114
541	37	93
542	112	170
543	47	93
544	178	62
545	123	199
546	110	
547	276	
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549	234	
550	185	
551	55	50
552	7	52
553	14	58
554	56	50
555	14	59
556	34	84
557	19	89
558	29	76
559	31	101
560	37	165
561	123	99
562	17	133
563	40	26
564	48	33
565	126	96
566	190	68
567	112	60
568	100	87
569	64	141
570	46	126
571	40	96
572	44	116
573	118	100
574	82	88
575	94	99
576	59	152
577	110	54
578	60	86
579	96	38
580	135	39
581	112	34
582	124	53
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585	90	83
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587	38	58
588	48	78
589	90	165
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591	94	39
592	165	158
593	165	157
594	105	69
595	105	66
596	112	70
597	118	68
598	98	116
599	124	111
600	250	240
601	35	70
602	86	75
603	96	78
604	94	80
605	104	41
606	121	88
607	17	109
608	55	84
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611	44	109
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614	18	128
615	35	95
616	8	64
617	9	177
618	31	87
619	10	135
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Data from Publications and Theses

MD#	Original #	JCU #	Analysis	Element	Original Ref	Original Ref Source	Collection	Rock Type	Rock Name	Area (or 1:100000 Shee
1	EHD1		1	M,T	G. Mark	Earnest Henry Report	N.Oliver	Diorite (Meta)	Earnest Henry Diorite	Ernest Henry
2	EHD5		1	M,T	G. Mark	Earnest Henry Report	N.Oliver	Diorite (Meta)	Earnest Henry Diorite	Ernest Henry
3	EHD6		1	M,T	G. Mark	Earnest Henry Report	N.Oliver	Diorite (Meta)	Earnest Henry Diorite	Ernest Henry
4	EHD2		1	M,T	G. Mark	Earnest Henry Report	N.Oliver	Diorite (Meta)	Earnest Henry Diorite	Ernest Henry
5	EHD3		1	M,T	G. Mark	Earnest Henry Report	N.Oliver	Diorite (Meta)	Earnest Henry Diorite	Ernest Henry
6	EHD4		1	M,T	G. Mark	Earnest Henry Report	N.Oliver	Diorite (Meta)	Earnest Henry Diorite	Ernest Henry
7	EHD7		1	M,T	G. Mark	Earnest Henry Report	N.Oliver	Diorite (Meta)	Earnest Henry Diorite	Ernest Henry
8	EHD8		1	M,T	G. Mark	Earnest Henry Report	N.Oliver	Diorite (Meta)	Earnest Henry Diorite	Ernest Henry
9	D254B		1	M,T	N. Oliver	N.Oliver - J Pet 1994	N.Oliver	Scapolatised Metadolerite		Mary Kathleen FB
10	D254A		1	M,T	N. Oliver	N.Oliver - J Pet 1994	N.Oliver	Scapolatised Metadolerite		Mary Kathleen FB
11	D252		1	M,T	N. Oliver	N.Oliver - J Pet 1994	N.Oliver	Scapolatised Metadolerite		Mary Kathleen FB
12	D251		1	M,T	N. Oliver	N.Oliver - J Pet 1994	N.Oliver	Scapolatised Metadolerite		Mary Kathleen FB
13	D247		1	M,T	N. Oliver	N.Oliver - J Pet 1994	N.Oliver	Scapolatised Metadolerite		Mary Kathleen FB
14	D246		1	M,T	N. Oliver	N.Oliver - J Pet 1994	N.Oliver	Scapolatised Metadolerite		Mary Kathleen FB
15	D245		1	M,T	N. Oliver	N.Oliver - J Pet 1994	N.Oliver	Scapolatised Metadolerite		Mary Kathleen FB
16	D233		1	M,T	N. Oliver	N.Oliver - J Pet 1994	N.Oliver	Scapolatised Metadolerite		Mary Kathleen FB
17	D234A		1	M,T	N. Oliver	N.Oliver - J Pet 1994	N.Oliver	Scapolatised Metadolerite		Mary Kathleen FB
18	D233		1	M,T	N. Oliver	N.Oliver - J Pet 1994	N.Oliver	Scapolatised Metadolerite		Mary Kathleen FB
19	D234A		1	M,T	N. Oliver	N.Oliver - J Pet 1994	N.Oliver	Scapolatised Metadolerite		Mary Kathleen FB
20	D234B		1	M,T	N. Oliver	N.Oliver - J Pet 1994	N.Oliver	Scapolatised Metadolerite		Mary Kathleen FB
21	D235A		1	M,T	N. Oliver	N.Oliver - J Pet 1994	N.Oliver	Scapolatised Metadolerite		Mary Kathleen FB
22	D235B		1	M,T	N. Oliver	N.Oliver - J Pet 1994	N.Oliver	Scapolatised Metadolerite		Mary Kathleen FB
23	D236		1	M,T	N. Oliver	N.Oliver - J Pet 1994	N.Oliver	Scapolatised Metadolerite		Mary Kathleen FB
24	S284.5		1	M,T	Rubenach	Rubenach	M. Rubenach	Gabbro		Snake Creek
25	S493		1	M,T	Rubenach	Rubenach	M. Rubenach	Gabbro		Snake Creek
26	S572.4		1	M,T	Rubenach	Rubenach	M. Rubenach	Gabbro		Snake Creek
27	S585		1	M,T	Rubenach	Rubenach	M. Rubenach	Gabbro		Snake Creek
28	S256		1	M,T	Rubenach	Rubenach	M. Rubenach	Dolerites		Snake Creek
29	S701		1	M,T	Rubenach	Rubenach	M. Rubenach	Dolerites		Snake Creek
30	S707		1	M,T	Rubenach	Rubenach	M. Rubenach	Dolerites		Snake Creek
31	S587		1	M,T	Rubenach	Rubenach	M. Rubenach	Gabbro		Snake Creek
32	S588		1	M,T	Rubenach	Rubenach	M. Rubenach	Gabbro		Snake Creek
33	S492		1	M,T	Rubenach	Rubenach	M. Rubenach	Diorite		Snake Creek
34	S728		1	M,T	Rubenach	Rubenach	M. Rubenach	Diorite		Snake Creek
35	ADS2		1	M,T	Rubenach	Rubenach	M. Rubenach	Diorite		Snake Creek
36	S491		1	M,T	Rubenach	Rubenach	M. Rubenach	Gabbro		Snake Creek
37	H21.1	67441	1	M,T	Hingst	JCU Honours Thesis	M. Rubenach	Gabbro		Cloncurry Fault
38	H98	67459	1	M,T	Hingst	JCU Honours Thesis	M. Rubenach	Gabbro		Cloncurry Fault
39	H99	67459	1	M,T	Hingst	JCU Honours Thesis	M. Rubenach	Gabbro		Cloncurry Fault
40	H101	67460	1	M,T	Hingst	JCU Honours Thesis	M. Rubenach	Gabbro		Cloncurry Fault
41	H167	67477	1	M,T	Hingst	JCU Honours Thesis	M. Rubenach	Gabbro		Cloncurry Fault
42	AL17.4		1	M,T	Williams and Baker 1994	Williams and Baker 1994	P. Williams	Skarn Altered Amphibolites	Meta-andesite Skarn	Black Rock Prospect
43	AL17.5		1	M,T	Williams and Baker 1994	Williams and Baker 1994	P. Williams	Skarn Altered Amphibolites	Meta-andesite Skarn	Black Rock Prospect
44	AL17.6		1	M,T	Williams and Baker 1994	Williams and Baker 1994	P. Williams	Skarn Altered Amphibolites	Meta-andesite Skarn	Black Rock Prospect
45	CM29.2A(i)		1	M,T	Williams and Baker 1994	Williams and Baker 1994	P. Williams	Skarn Altered Amphibolites	High-Fe Garnet Skarn	Gidya Tank
46	CM29.2A(ii)		1	M,T	Williams and Baker 1994	Williams and Baker 1994	P. Williams	Skarn Altered Amphibolites	High-Fe Garnet Skarn	Gidya Tank
47	CJ12.2B		1	M,T	Williams and Baker 1994	Williams and Baker 1994	P. Williams	Skarn Altered Amphibolites	Meta-igneous Skarn	Fairmile
48	CJ12.2D		1	M,T	Williams and Baker 1994	Williams and Baker 1994	P. Williams	Skarn Altered Amphibolites	Meta-igneous Skarn	Fairmile
49	AS8.6		1	M,T	Williams and Baker 1994	Williams and Baker 1994	P. Williams	Skarn Altered Amphibolites	Meta-igneous Skarn	Dingo Prospect
50	CJ11.2		1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Fairmile
51	CJ11.3(i)		1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Fairmile
52	CJ11.5		1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Fairmile

53	CJ11.6	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Fairmile
54	CJ12.1B	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Fairmile
55	CJ12.1C	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Fairmile
56	CJ12.4	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Fairmile
57	CJ12.5	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Fairmile
58	AL10.9	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
59	AL10.10	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
60	AL10.11	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
61	AL10.12	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
62	AL10.13	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
63	AL10.18	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
64	AL10.19	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
65	AL13.1	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
66	AL13.14	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
67	AL13.17	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
68	AL13.21	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
69	AL13.34	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
70	AL13.35	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
71	AL13.37	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
72	AL13.45	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
73	AL14.1	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
74	AL14.2	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
75	AL14.6	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
76	AL14.8	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
77	AL14.13	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
78	AL14.36	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
79	AL14.38	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
80	AL18.18	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
81	AL18.21	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
82	AL18.22	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
83	AL18.29	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
84	AL18.30	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
85	AL18.33	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
86	AL18.34	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
87	AL18.42	1	M,T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
88	AL10.9	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
89	AL10.10	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
90	AL10.11	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
91	AL10.12	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
92	AL10.13	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
93	AL10.18	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
94	AL10.19	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
95	AL13.1	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
96	AL13.14	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
97	AL13.17	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
98	AL13.21	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
99	AL13.34	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
100	AL13.35	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
101	AL13.37	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
102	AL13.45	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
103	AL14.1	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
104	AL14.2	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
105	AL14.6	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
106	AL14.8	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
107	AL14.13	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
108	AL14.36	2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee

109	AL14.38		2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
110	AL18.18		2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
111	AL18.21		2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
112	AL18.22		2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
113	AL18.29		2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
114	AL18.30		2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
115	AL18.33		2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
116	AL18.34		2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
117	AL18.42		2	REE	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
118	AL10.9		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
119	AL10.10		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
120	AL10.11		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
121	AL10.12		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
122	AL10.13		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
123	AL10.18		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
124	AL10.19		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
125	AL13.1		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
126	AL13.14		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
127	AL13.17		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
128	AL13.21		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
129	AL13.34		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
130	AL13.35		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
131	AL13.37		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
132	AL13.45		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
133	AL14.1		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
134	AL14.2		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
135	AL14.6		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
136	AL14.8		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
137	AL14.13		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
138	AL14.36		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
139	AL14.38		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
140	AL18.18		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
141	AL18.21		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
142	AL18.22		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
143	AL18.29		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
144	AL18.30		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
145	AL18.33		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
146	AL18.34		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
147	AL18.42		3	T	Williams 1998 AJES	Williams 1998 AJES	P. Williams	Amphibolite	High-Fe Meta-tholeiites	Maramungee
148	FQ9647TC	60292	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
149	FQ9648TC	60293	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
150	FQ9649TC	60294	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Biotite Amphibolite	Biotite Amphibolite	Cannington
151	FQ9650TC	60295	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
152	FQ9651TC	60296	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
153	FQ9652TC	60297	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
154	FQ9653TC	60298	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
155	FQ9654TC*	60299	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Garnet Amphibolite	Garnet Amphibolite	Cannington
156	FQ9655TC	60300	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
157	FQ9656TC	60301	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Fine Grained Amphibolite	Fine Grained Amphibolite	Cannington
158	FQ9657TC	60302	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
159	FQ9658TC	60303	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
160	FQ9659TC	60304	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
161	FQ9660TC	60305	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
162	FQ9661TC	60306	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
163	FQ9662TC	60307	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
164	FQ9663TC	60308	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington

165	FQ9664TC*	60309	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Altered Amphibolite	Altered Amphibolite	Cannington
166	FQ9665TC	60310	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Fine Grained Amphibolite	Fine Grained Amphibolite	Cannington
167	FQ9666CS	60311	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
168	GF9004TC	60315	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
169	GF9005TC	60316	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
170	GF9006TC	60317	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
171	GF9007TC	60318	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
172	GF9008TC	60319	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
173	GF9009TC	60320	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Biotite Amphibolite	Biotite Amphibolite	Cannington
174	GF9010TC	60321	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
175	GF9012TC	60323	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
176	GF9013TC	60324	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Garnet Amphibolite	Garnet Amphibolite	Cannington
177	GF9014TC	60325	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
178	GF9017TC	60328	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
179	GF9018TC	60329	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
180	GF9019TC	60330	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Altered Amphibolite	Altered Amphibolite	Cannington
181	GF9491TC	60334	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
182	GF9492TC	60335	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
183	GF9493TC	60336	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
184	GF9494TC	60337	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
185	GF9495TC	60338	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
186	GF9496TC	60339	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
187	GF9497TC	60340	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Amphibolite	Amphibolite	Cannington
188	GF9498TC	60341	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Garnet Amphibolite	Garnet Amphibolite	Cannington
189	GF9499TC	60342	1	M, T	M. Smith	JCU Honours Thesis	P.Williams	Fine Grained Amphibolite	Fine Grained Amphibolite	Cannington
190	46637	46637	1	M, T	N.Adshead	JCU PhD Thesis	P.Williams	Amphibolite	Meta-tholeiites	Osborne
191	46584	46584	1	M, T	N.Adshead	JCU PhD Thesis	P.Williams	Amphibolite	Meta-tholeiites	Osborne
192	46483	46483	1	M, T	N.Adshead	JCU PhD Thesis	P.Williams	Amphibolite	Meta-tholeiites	Osborne
193	46541	46541	1	M, T	N.Adshead	JCU PhD Thesis	P.Williams	Amphibolite	Meta-tholeiites	Osborne
194	46495	46495	1	M, T	N.Adshead	JCU PhD Thesis	P.Williams	Amphibolite	Meta-tholeiites	Osborne
195	46474	46474	1	M, T	N.Adshead	JCU PhD Thesis	P.Williams	Amphibolite	Meta-tholeiites	Osborne
196	46556	46556	1	M, T	N.Adshead	JCU PhD Thesis	P.Williams	Amphibolite	Meta-tholeiites	Osborne
197	46647	46647	1	M, T	N.Adshead	JCU PhD Thesis	P.Williams	Amphibolite	Meta-tholeiites	Osborne
198	46841	46841	1	M, T	N.Adshead	JCU PhD Thesis	P.Williams	Amphibolite	Meta-tholeiites	Osborne
199	BL18.2A		1	M, T	P.Williams	P.Williams	P.Williams	Amphibolite		Pegmont
200	BL18.3A		1	M, T	P.Williams	P.Williams	P.Williams	Amphibolite		Pegmont
201	BL30.1A		1	M, T	P.Williams	P.Williams	P.Williams	Diorite	(Hypersthene-Gabbro?)	Pegmont
202	BL30.1B		1	M, T	P.Williams	P.Williams	P.Williams	Diorite	(Hypersthene-Gabbro?)	Pegmont
203	731-07	42673	1	M, T	R.Thomas	JCU Honours Thesis	P.Williams	Felsic Porphyry		Little Eva
204	731-08	42674	1	M, T	R.Thomas	JCU Honours Thesis	P.Williams	Felsic Porphyry		Little Eva
205	731-09	42657	1	M, T	R.Thomas	JCU Honours Thesis	P.Williams	Albite-magnetite alteration	Tholeiitic Host	Little Eva
206	731-10	42676	1	M, T	R.Thomas	JCU Honours Thesis	P.Williams	Albite-magnetite alteration	Tholeiitic Host	Little Eva
207	731-11	42677	1	M, T	R.Thomas	JCU Honours Thesis	P.Williams	Albite-magnetite alteration	Tholeiitic Host	Little Eva
208	731-04	42663	1	M, T	R.Thomas	JCU Honours Thesis	P.Williams	Biotite-Scapolite Schist		Little Eva
209	731-06	42668	1	M, T	R.Thomas	JCU Honours Thesis	P.Williams	Biotite-Scapolite Schist		Little Eva
210	731-01	42666	1	M, T	R.Thomas	JCU Honours Thesis	P.Williams	Scapolite-magnetite alteration	Tholeiitic Host	Little Eva
211	731-02	42666a	1	M, T	R.Thomas	JCU Honours Thesis	P.Williams	Scapolite-magnetite alteration	Tholeiitic Host	Little Eva
212	731-03	42662	1	M, T	R.Thomas	JCU Honours Thesis	P.Williams	Albite alteration	Tholeiitic Host	Little Eva
213	731-05	42667	1	M, T	R.Thomas	JCU Honours Thesis	P.Williams	Kspar-Hematite alteration	Tholeiitic Host	Little Eva
214	731-04	42663	2	T, (REE)	R.Thomas	JCU Honours Thesis	P.Williams	Biotite-Scapolite Schist		Little Eva
215	731-06	42668	2	T, (REE)	R.Thomas	JCU Honours Thesis	P.Williams	Biotite-Scapolite Schist		Little Eva
216	731-01	42666	2	T, (REE)	R.Thomas	JCU Honours Thesis	P.Williams	Scapolite-magnetite alteration	Tholeiitic Host	Little Eva
217	731-02	42666a	2	T, (REE)	R.Thomas	JCU Honours Thesis	P.Williams	Scapolite-magnetite alteration	Tholeiitic Host	Little Eva
218	731-03	42662	2	T, (REE)	R.Thomas	JCU Honours Thesis	P.Williams	Albite alteration	Tholeiitic Host	Little Eva
219	731-05	42667	2	T, (REE)	R.Thomas	JCU Honours Thesis	P.Williams	Kspar-Hematite alteration	Tholeiitic Host	Little Eva
220	8508	48543	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Altered Amphibolite		Mount Elliot

221	2108	48469	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Altered Amphibolite	Mount Elliot
222	2109	48470	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Altered Amphibolite	Mount Elliot
223	2110	48471	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Altered Amphibolite	Mount Elliot
224	8509	48544	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Altered Amphibolite	Mount Elliot
225	S5-14	27388	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Altered Amphibolite	Mount Elliot-SWAN
226	S4-02	48885	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Altered Amphibolite	Mount Elliot-SWAN
227	U2-15B	27469B	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Altered Amphibolite	Mount Elliot
228	S4-N2	48886	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Altered Amphibolite	Mount Elliot-SWAN
229	E89	48554	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Amphibolite	Mount Elliot
230	E90	48556	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Amphibolite	Mount Elliot
231	E91	48558	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Amphibolite	Mount Elliot
232	E98	48569	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Amphibolite	Mount Elliot
233	8502	48537	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Amphibolite	Mount Elliot
234	E12	48457	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Metabasalt	Mount Elliot
235	E43	48515	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Metabasalt	Mount Elliot
236	11001	48574	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Metabasalt	Mount Elliot
237	11002	48575	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Metabasalt	Mount Elliot
238	3103	48504	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Fine Grained Massive Skarn	Mount Elliot
239	3104	48505	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Fine Grained Massive Skarn	Mount Elliot
240	3105	48506	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Fine Grained Massive Skarn	Mount Elliot
241	3106	48507	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Fine Grained Massive Skarn	Mount Elliot
242	3107	48508	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Fine Grained Massive Skarn	Mount Elliot
243	3108	48509	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Fine Grained Massive Skarn	Mount Elliot
244	3109	48510	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Fine Grained Massive Skarn	Mount Elliot
245	3110	48511	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Fine Grained Massive Skarn	Mount Elliot
246	3111	48512	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Massive Skarn	Mount Elliot
247	2108	48469	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Altered Amphibolite	Mount Elliot
248	2109	48470	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Altered Amphibolite	Mount Elliot
249	2110	48471	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Altered Amphibolite	Mount Elliot
250	7902	48534	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Metabasalt	Mount Elliot
251	S4-N1	48884	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Fine Grained Massive Skarn	Mount Elliot-SWAN
252	3101	48502	1	M, T	S.Wang	Provisional Ph.D Thesis	P.Williams	Fine Grained Massive Skarn	Mount Elliot
253	48334	48334	1	M, T	Baker	JCU PhD Thesis	Baker/PJW	Amphibolite	Eloise
254	48291	48291	1	M, T	Baker	JCU PhD Thesis	Baker/PJW	Amphibolite	Eloise
255	48313A	48313A	1	M, T	Baker	JCU PhD Thesis	Baker/PJW	Replacive Ab V in Amphibolite	Eloise
256	48127	48127	1	M, T	Baker	JCU PhD Thesis	Baker/PJW	Chl V in Amphibolite	Eloise
257	R.S.3	62841	1	M, T	SYNA	JCU Honours Thesis	SYNA 2000	Amphibolite	Osborne
258	OSB 19 (A)	62834	1	M, T	SYNA	JCU Honours Thesis	SYNA 2000	Amphibolite	Osborne
259	R.S.7	62856	1	M, T	SYNA	JCU Honours Thesis	SYNA 2000	Amphibolite	Osborne
260	HONQ 29 (B)	62839	1	M, T	SYNA	JCU Honours Thesis	SYNA 2000	Amphibolite	Houdini Prospect
261	OSB 19 (B)	62835	1	M, T	SYNA	JCU Honours Thesis	SYNA 2000	Amphibolite	Osborne
262	R.S.3	62841	2	REE	SYNA	JCU Honours Thesis	SYNA 2000	Amphibolite	Osborne
263	OSB 19 (A)	62834	2	REE	SYNA	JCU Honours Thesis	SYNA 2000	Amphibolite	Osborne
264	R.S.7	62856	2	REE	SYNA	JCU Honours Thesis	SYNA 2000	Amphibolite	Osborne
265	HONQ 29 (B)	62839	2	REE	SYNA	JCU Honours Thesis	SYNA 2000	Amphibolite	Houdini Prospect
266	OSB 19 (B)	62835	2	REE	SYNA	JCU Honours Thesis	SYNA 2000	Amphibolite	Osborne
267	1.1		1	M,T,REE	G. de Jong	G.de Jong et al 1998	P. Williams	Amphibolite	Fullarton River Suite 1
268	1.2		1	M,T,REE	G. de Jong	G.de Jong et al 1998	P. Williams	Amphibolite	Fullarton River Suite 1
269	1.3		1	M,T,REE	G. de Jong	G.de Jong et al 1998	P. Williams	Amphibolite	Fullarton River Suite 1
270	2.1		1	M,T,REE	G. de Jong	G.de Jong et al 1998	P. Williams	Amphibolite	Fullarton River Suite 2
271	2.2		1	M,T,REE	G. de Jong	G.de Jong et al 1998	P. Williams	Amphibolite	Fullarton River Suite 2
272	3.1		1	M,T,REE	G. de Jong	G.de Jong et al 1998	P. Williams	Amphibolite	Maramungee Creek
273	3.2		1	M,T,REE	G. de Jong	G.de Jong et al 1998	P. Williams	Amphibolite	Maramungee Creek
274	3.3		1	M,T,REE	G. de Jong	G.de Jong et al 1998	P. Williams	Amphibolite	Maramungee Creek
275	3.4		1	M,T,REE	G. de Jong	G.de Jong et al 1998	P. Williams	Amphibolite	Maramungee Creek
276	3.5		1	M,T,REE	G. de Jong	G.de Jong et al 1998	P. Williams	Amphibolite	Maramungee Creek

277	E89		1	M, T	Wang & Williams	Wang & Williams 2001	P. Williams	Amphibolite		Mount Elliot
278	8509		1	M, T	Wang & Williams	Wang & Williams 2001	P. Williams	Amphibolite Altered		Mount Elliot
279	9B		1	M,T	M. Kennedy	Kennedy 1999	Rubenach	Amphibolite		Osborne
280	10		1	M,T	M. Kennedy	Kennedy 1999	Rubenach	Amphibolite		Osborne
281	74205475(1)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Prospector Sheet
282	74205476(2)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Prospector Sheet
283	74205514(3)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Quamby
284	74205520(4)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Prospector Sheet
285	74205531(5)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Prospector Sheet
286	74205532(6)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Prospector Sheet
287	74205536(7)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Prospector Sheet
288	74205522(8)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Prospector Sheet
289	742055239(9)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Prospector Sheet
290	74205524(10)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Prospector Sheet
291	74205527(11)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Prospector Sheet
292	74205567(12)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Prospector Sheet
293	74205658(13)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Malbon Sheet
294	74205666(14)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Malbon Sheet
295	74205666(15)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Malbon Sheet
296	74205670(16)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Malbon Sheet
297	74205671(17)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Malbon Sheet
298	74205672(18)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Malbon Sheet
299	74205675(19)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Mt Angelay Sheet
300	74205683(20)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Mt Angelay Sheet
301	74205657(21)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Cloncurry Sheet
302	74205684(22)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Cloncurry Sheet
303	74205652(23)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Lunch Creek Gabbro	Cloncurry Sheet
304	74205650(24)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Cloncurry Sheet
305	74205615(25)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Marraba Sheet
306	74200097(26)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Prospector Sheet
307	74205525(27)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Prospector Sheet
308	73205369(28)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Marraba Sheet
309	74205622(29)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Marraba Sheet
310	74205673(30)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Mt Angelay Sheet
311	74205674(31)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Mt Angelay Sheet
312	74205676(32)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Mt Angelay Sheet
313	74205678(33)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Mt Angelay Sheet
314	74205693(34)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Selwyn
315	74205699(35)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Selwyn
316	74205701(36)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Dolerite	Dolerite	Selwyn
317	74205539(9 - M)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Scapolite Dolerite	Scapolite Dolerite	Prospector Sheet
318	74205651 (10 - M)		1	M,T	Ellis & Wyborn	Ellis & Wyborn 1984	AGSO	Scapolite Dolerite	Scapolite Dolerite	Cloncurry Sheet
319	MFC015 1	59198	1	M,T	Matt Brown Hons Thesis	Matt Brown Hons Thesis	M. Brown	Gabbro	Tea Tree Creek Layered Complex	
320	MFC015 8	59204	1	M,T	Matt Brown Hons Thesis	Matt Brown Hons Thesis	M. Brown	Gabbro	Tea Tree Creek Layered Complex	
321	TT001 10	59102	1	M,T	Matt Brown Hons Thesis	Matt Brown Hons Thesis	M. Brown	Olivine Gabbro	Tea Tree Creek Layered Complex	
322	121	44643	1	M,T	G. de Jong PhD Thesis	G. de Jong PhD Thesis	G. de Jong	Metadolerite	Amphibolite Dyke	Maramungee Creek
323	9	44592	1	M,T	G. de Jong PhD Thesis	G. de Jong PhD Thesis	G. de Jong	Metadolerite	Metadolerite Dyke	Maramungee Creek
324	10	44593	1	M,T	G. de Jong PhD Thesis	G. de Jong PhD Thesis	G. de Jong	Metadolerite	Metadolerite	Maramungee Creek
325	14	44594	1	M,T	G. de Jong PhD Thesis	G. de Jong PhD Thesis	G. de Jong	Metadolerite	Metadolerite	Maramungee Creek
326	136	44650	1	M,T	G. de Jong PhD Thesis	G. de Jong PhD Thesis	G. de Jong	Metadolerite	Metadolerite	Maramungee Creek
327	90	44633	1	M,T	G. de Jong PhD Thesis	G. de Jong PhD Thesis	G. de Jong	Metadolerite	Metadolerite dyke with qtz-ab-plag veining	Maramungee Creek
328	99	44635	1	M,T	G. de Jong PhD Thesis	G. de Jong PhD Thesis	G. de Jong	Metadolerite	Metadolerite with Marialite and Scapolit	Maramungee Creek
329	163B	44667	1	M,T	G. de Jong PhD Thesis	G. de Jong PhD Thesis	G. de Jong	Metadolerite	Metadolerite	Maramungee Creek
330	5	44588	1	M,T	G. de Jong PhD Thesis	G. de Jong PhD Thesis	G. de Jong	Metadolerite	Metadolerite Dyke (Foliated)	Maramungee Creek
331	78	44625	1	M,T	G. de Jong PhD Thesis	G. de Jong PhD Thesis	G. de Jong	Metadolerite	Metabasalt/Metadolerite	Maramungee Creek
332	172	44675	1	M,T	G. de Jong PhD Thesis	G. de Jong PhD Thesis	G. de Jong	Metadolerite	Altered Metadolerite	Maramungee Creek

333	172B	44676	1	M,T	G. de Jong PhD Thesis	G. de Jong PhD Thesis	G. de Jong	Metadolerite	Metadolerite	Maramungee Creek
334	172C	44677	1	M,T	G. de Jong PhD Thesis	G. de Jong PhD Thesis	G. de Jong	Metadolerite	Metadolerite	Maramungee Creek
335	172D	44678	1	M,T	G. de Jong PhD Thesis	G. de Jong PhD Thesis	G. de Jong	Metadolerite	Metadolerite	Maramungee Creek
336	172E	44679	1	M,T	G. de Jong PhD Thesis	G. de Jong PhD Thesis	G. de Jong	Metadolerite	Metadolerite	Maramungee Creek

Location (or Grid Ref)	Location (N)	Location (E)	Un/Altered	Alt Type	Age	Notes	Hole	Depth	Depth (core)	Top mnz (core)
Northwest or south of Deposit			Unaltered		1660 ma Titanite	Sybella Granite Age				
Northwest or south of Deposit			Unaltered		1660 ma Titanite	Sybella Granite Age				
Northwest or south of Deposit			Unaltered		1660 ma Titanite	Sybella Granite Age				
Northwest or south of Deposit			Altered	Albitised	1660 ma Titanite	Sybella Granite Age				
Northwest or south of Deposit			Altered	Albitised	1660 ma Titanite	Sybella Granite Age				
Northwest or south of Deposit			Altered	Albitised	1660 ma Titanite	Sybella Granite Age				
Northwest or south of Deposit			Altered	Albitised	1660 ma Titanite	Sybella Granite Age				
Northwest or south of Deposit			Altered	Albitised	1660 ma Titanite	Sybella Granite Age				
East (1-2km) of Mary Kathleen			Altered	Scapolitised	1750 - 1730Ma	Syn DE (D1 in MKFB) - Pre D1 Isan				
East (1-2km) of Mary Kathleen			Altered	Scapolitised	1750 - 1730Ma	Syn DE (D1 in MKFB) - Pre D1 Isan				
East (1-2km) of Mary Kathleen			Altered	Scapolitised	1750 - 1730Ma	Syn DE (D1 in MKFB) - Pre D1 Isan				
East (1-2km) of Mary Kathleen			Altered	Scapolitised	1750 - 1730Ma	Syn DE (D1 in MKFB) - Pre D1 Isan				
East (1-2km) of Mary Kathleen			Altered	Scapolitised	1750 - 1730Ma	Syn DE (D1 in MKFB) - Pre D1 Isan				
East (1-2km) of Mary Kathleen			Altered	Scapolitised	1750 - 1730Ma	Syn DE (D1 in MKFB) - Pre D1 Isan				
East (1-2km) of Mary Kathleen			Altered	Scapolitised	1750 - 1730Ma	Syn DE (D1 in MKFB) - Pre D1 Isan				
East (1-2km) of Mary Kathleen			Altered	Scapolitised	1750 - 1730Ma	Syn DE (D1 in MKFB) - Pre D1 Isan				
East (1-2km) of Mary Kathleen			Altered	Scapolitised	1750 - 1730Ma	Syn DE (D1 in MKFB) - Pre D1 Isan				
East (1-2km) of Mary Kathleen			Altered	Scapolitised	1750 - 1730Ma	Syn DE (D1 in MKFB) - Pre D1 Isan				
East (1-2km) of Mary Kathleen			Altered	Scapolitised	1750 - 1730Ma	Syn DE (D1 in MKFB) - Pre D1 Isan				
East (1-2km) of Mary Kathleen			Altered	Scapolitised	1750 - 1730Ma	Syn DE (D1 in MKFB) - Pre D1 Isan				
East (1-2km) of Mary Kathleen			Altered	Scapolitised	1750 - 1730Ma	Syn DE (D1 in MKFB) - Pre D1 Isan				
East (1-2km) of Mary Kathleen			Altered	Scapolitised	1750 - 1730Ma	Syn DE (D1 in MKFB) - Pre D1 Isan				
East (1-2km) of Mary Kathleen			Altered	Scapolitised	1750 - 1730Ma	Syn DE (D1 in MKFB) - Pre D1 Isan				
			Unaltered		Pre-D1	Pre-D1 Isan				
			Unaltered		Pre-D1	Pre-D1 Isan				
			Unaltered		Pre-D1	Pre-D1 Isan				
			Unaltered		Pre-D1	Pre-D1 Isan				
			Unaltered		~1550 Ma	syn-D2 Isan				
			Unaltered		~1550 Ma	syn-D2 Isan				
			Unaltered		~1550 Ma	syn-D2 Isan				
			Unaltered		Late	Assoiciated with Saxby Granite				
			Unaltered		Late	Assoiciated with Saxby Granite				
			Unaltered		Pre_D1	Pre-D1 Isan				
			Unaltered		Pre_D1	Pre-D1 Isan				
			Unaltered		Pre_D1	Pre-D1 Isan				
			Unaltered		Pre-D1	Pre-D1 Isan				
					Late	titan, cpx, trem-act, scap				
					Late	Cpx, plag, ep, cl amph, Hb, musc, opx, pyrite, chalco, cc				
					Late	Cpx, plag, ep, cl amph, Hb, musc				
					Late	Cpx, plag, ep, cl amph, Hb, musc				
					Late	Cpx, plag, ep, cl amph, Hb, musc				
			Altered	Skarn						
			Altered	Skarn						
			Altered	Skarn						
			Altered	Skarn						
			Altered	Skarn						
			Altered	Skarn						
			Altered	Skarn						
			Altered	Skarn						
			?Weak		1670-1620Ma	Maronan Supergroup				
			?Weak		1670-1620Ma	Maronan Supergroup				
			?Weak		1670-1620Ma	Maronan Supergroup				

	?Weak	1670-1620Ma	Maronan Supergroup				
	?Weak	1670-1620Ma	Maronan Supergroup				
	?Weak	1670-1620Ma	Maronan Supergroup				
	?Weak	1670-1620Ma	Maronan Supergroup				
	?Weak	1670-1620Ma	Maronan Supergroup				
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-37	338.00	168.50	190.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-37	343.50	173.50	190.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-37	354.50	182.00	190.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-37	356.50	183.50	190.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-37	358.50	184.50	190.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-37	386.50	205.50	190.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-37	389.00	207.50	190.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-36	73.50	32.50	137.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-36	152.00	72.50	137.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-36	168.50	87.00	137.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-36	186.50	95.00	137.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-36	237.50	131.00	137.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-36	243.75	136.00	137.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-36	252.50	140.50	137.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-36	268.80	151.00	137.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-23	22.75	18.50	155.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-23	25.50	20.50	155.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-23	41.25	33.00	155.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-23	46.75	37.00	155.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-23	57.00	45.00	155.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-23	161.50	134.00	155.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-23	167.25	140.00	155.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-22	168.00		
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-27	121.25	114.50	123.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-27	124.25	118.00	123.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-27	163.00	152.00	123.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-8	58.00	47.50	163.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-8	76.50	67.00	163.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-8	85.00	75.00	163.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-8	120.00	106.50	163.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-37	338.00	168.50	190.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-37	343.50	173.50	190.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-37	354.50	182.00	190.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-37	356.50	183.50	190.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-37	358.50	184.50	190.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-37	386.50	205.50	190.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-37	389.00	207.50	190.50
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-36	73.50	32.50	137.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-36	152.00	72.50	137.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-36	168.50	87.00	137.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-36	186.50	95.00	137.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-36	237.50	131.00	137.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-36	243.75	136.00	137.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-36	252.50	140.50	137.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-36	268.80	151.00	137.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-23	22.75	18.50	155.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-23	25.50	20.50	155.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-23	41.25	33.00	155.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-23	46.75	37.00	155.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-23	57.00	45.00	155.00
Drill Core	?Weak	1670-1620Ma	Maronan Supergroup	74-23	161.50	134.00	155.00

Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-23	167.25	140.00	155.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-22	168.00		
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-27	121.25	114.50	123.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-27	124.25	118.00	123.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-27	163.00	152.00	123.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-8	58.00	47.50	163.50
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-8	76.50	67.00	163.50
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-8	85.00	75.00	163.50
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-8	120.00	106.50	163.50
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-37	338.00	168.50	190.50
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-37	343.50	173.50	190.50
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-37	354.50	182.00	190.50
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-37	356.50	183.50	190.50
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-37	358.50	184.50	190.50
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-37	386.50	205.50	190.50
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-37	389.00	207.50	190.50
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-36	73.50	32.50	137.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-36	152.00	72.50	137.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-36	168.50	87.00	137.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-36	186.50	95.00	137.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-36	237.50	131.00	137.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-36	243.75	136.00	137.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-36	252.50	140.50	137.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-36	268.80	151.00	137.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-23	22.75	18.50	155.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-23	25.50	20.50	155.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-23	41.25	33.00	155.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-23	46.75	37.00	155.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-23	57.00	45.00	155.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-23	161.50	134.00	155.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-23	167.25	140.00	155.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-22	168.00		
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-27	121.25	114.50	123.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-27	124.25	118.00	123.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-27	163.00	152.00	123.00
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-8	58.00	47.50	163.50
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-8	76.50	67.00	163.50
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-8	85.00	75.00	163.50
Drill Core	?Weak		1670-1620Ma	Maronan Supergroup	74-8	120.00	106.50	163.50
Core Amphibolite Body			Pre-D1		CAD068	424.15		
Core Amphibolite Body			Pre-D1		CAD068	430.50		
Core Amphibolite Body	Altered	Biotite	Pre-D1		CAD068	438.85		
Core Amphibolite Body			Pre-D1		CAD068	441.40		
Core Amphibolite Body			Pre-D1		CAD068	446.55		
Core Amphibolite Body			Pre-D1		CAD068	478.85		
Core Amphibolite Body			Pre-D1		CAD068	487.85		
Core Amphibolite Body	Altered	Garnet	Pre-D1		CAD068	513.00		
Core Amphibolite Body			Pre-D1		CAD068	513.80		
Core Amphibolite Body			Pre-D1		CAD068	518.75		
Core Amphibolite Body			Pre-D1		CAD032	477.75		
Core Amphibolite Body			Pre-D1		CAD032	490.60		
Core Amphibolite Body			Pre-D1		CAD032	502.75		
Core Amphibolite Body			Pre-D1		CAD032	514.20		
Core Amphibolite Body			Pre-D1		CAD032	524.45		
Core Amphibolite Body			Pre-D1		CAD032	527.35		
Core Amphibolite Body			Pre-D1		CAD056	373.85		

Core Amphibolite Body			Altered		Pre-D1		CAD056	379.15
Core Amphibolite Body					Pre-D1		CAD056	392.25
Core Amphibolite Body					Pre-D1		CAD056	403.45
Core Amphibolite Body					Pre-D1		CAD359	
Core Amphibolite Body					Pre-D1		CAD359	
Core Amphibolite Body					Pre-D1		CAD359	
Core Amphibolite Body					Pre-D1		CAD359	
Core Amphibolite Body					Pre-D1		CAD359	
Core Amphibolite Body			Altered	Biotite	Pre-D1		CAD359	
Core Amphibolite Body					Pre-D1		CAD359	
Core Amphibolite Body					Pre-D1		CAD359	
Core Amphibolite Body			Altered	Garnet	Pre-D1		CAD359	
Core Amphibolite Body					Pre-D1		CAD359	
Core Amphibolite Body					Pre-D1		CAD354	
Core Amphibolite Body					Pre-D1		CAD354	
Core Amphibolite Body			Altered		Pre-D1		CAD354	
Core Amphibolite Body					Pre-D1		CAD384	
Core Amphibolite Body					Pre-D1		CAD384	
Core Amphibolite Body					Pre-D1		CAD384	
Core Amphibolite Body					Pre-D1		CAD384	
Core Amphibolite Body					Pre-D1		CAD384	
Core Amphibolite Body					Pre-D1		CAD384	
Core Amphibolite Body					Pre-D1		CAD384	
Core Amphibolite Body			Altered	Garnet	Pre-D1		CAD384	
Core Amphibolite Body					Pre-D1		CAD384	
Drill Core			?Altered				TTHQ055	257.70
Drill Core			?Altered				TTHQ032	182.00
Drill Core			?Altered				TTNQ199	220.00
Drill Core			?Altered				TTHQ035	148.30
Drill Core			?Altered				TTNQ304	615.40
Drill Core			?Altered				TTNQ081	368.00
Drill Core			?Altered				TTHQ031	171.10
Drill Core			?Altered				TTNQ125	209.80
Drill Core			?Altered				TTNQ197	206.70
			Altered					
			Altered					
			Altered					
			Altered					
	25825	11600	Altered					
	25900	11600	Altered					
Drill Core			Altered				LE001	70.00
	25825	11600	Altered					
	25950	11560	Altered					
Drill Core			Altered				LE003	155.00
Drill Core			Altered				LE004	108.00
Drill Core			Altered				LE006	61.00
Drill Core			Altered				LE006	61.00
Drill Core			Altered	Albite			LE002	81.85
Drill Core			Altered				LE006	99.60
Drill Core			Altered				LE003	155.00
Drill Core			Altered				LE004	108.00
Drill Core			Altered				LE006	61.00
Drill Core			Altered				LE006	61.00
Drill Core			Altered	Albite			LE002	81.85
Drill Core			Altered				LE006	99.60
Drill Core			Altered		1670-1620Ma	Maronan Supergroup	MEQ94-85	139.60

Drill Core	Altered		1670-1620Ma	Maronan Supergroup	MEQ90-21		257.85
Drill Core	Altered		1670-1620Ma	Maronan Supergroup	MEQ90-21		264.95
Drill Core	Altered		1670-1620Ma	Maronan Supergroup	MEQ90-21		266.30
Drill Core	Altered		1670-1620Ma	Maronan Supergroup	MEQ94-85		142.80
Drill Core	Altered		1670-1620Ma	Maronan Supergroup	CRQ79-S5		334.85
Drill Core	Altered		1670-1620Ma	Maronan Supergroup	CRQ79-S4		182.70
Drill Core	Altered		1670-1620Ma	Maronan Supergroup	UMED2		219.95
Drill Core	Altered		1670-1620Ma	Maronan Supergroup	CRQ79-S4		189.15
Drill Core	Unaltered		1670-1620Ma	Maronan Supergroup	MEQ94-89		98.60
Drill Core	Unaltered		1670-1620Ma	Maronan Supergroup	MEQ94-90		89.20
Drill Core	Unaltered		1670-1620Ma	Maronan Supergroup	MEQ94-91		92.00
Drill Core	Unaltered		1670-1620Ma	Maronan Supergroup	MEQ94-98		43.90
Drill Core	Unaltered		1670-1620Ma	Maronan Supergroup	MEQ94-85		92.10
Drill Core	?		1670-1620Ma	Maronan Supergroup	MEQ89-13		343.30
Drill Core	?		1670-1620Ma	Maronan Supergroup	MEQ91-43		318.40
Drill Core	?		1670-1620Ma	Maronan Supergroup	MEQ94-110		165.30
Drill Core	?		1670-1620Ma	Maronan Supergroup	MEQ94-110		172.20
Drill Core	Altered	Skarn	1670-1620Ma	Maronan Supergroup	MEQ91-31		139.61
Drill Core	Altered	Skarn	1670-1620Ma	Maronan Supergroup	MEQ91-31		140.50
Drill Core	Altered	Skarn	1670-1620Ma	Maronan Supergroup	MEQ91-31		141.11
Drill Core	Altered	Skarn	1670-1620Ma	Maronan Supergroup	MEQ91-31		145.47
Drill Core	Altered	Skarn	1670-1620Ma	Maronan Supergroup	MEQ91-31		148.26
Drill Core	Altered	Skarn	1670-1620Ma	Maronan Supergroup	MEQ91-31		151.70
Drill Core	Altered	Skarn	1670-1620Ma	Maronan Supergroup	MEQ91-31		152.10
Drill Core	Altered	Skarn	1670-1620Ma	Maronan Supergroup	MEQ91-31		153.10
Drill Core	Altered	Skarn	1670-1620Ma	Maronan Supergroup	MEQ91-31		154.57
Drill Core	Altered		1670-1620Ma	Maronan Supergroup	MEQ90-21		257.85
Drill Core	Altered		1670-1620Ma	Maronan Supergroup	MEQ90-21		264.95
Drill Core	Altered		1670-1620Ma	Maronan Supergroup	MEQ90-21		266.30
Drill Core	?		1670-1620Ma	Maronan Supergroup	MEQ94-79		85.80
Drill Core	Altered	Skarn	1670-1620Ma	Maronan Supergroup	CRQ79-S4		181.75
Drill Core	Altered	Skarn	1670-1620Ma	Maronan Supergroup	MEQ91-31		137.33
						69	225.00
						80	485.90
						6	86.00
						39	518.00
Underground Drill Drive	Altered		Pre-D2 at latest	Oikycrystic-hedenbergite-bearing amphibolite	925 ISS / 795 ISS		
	Unaltered		Pre-D2 at latest	Unaltered hbe rich amphibolite + plag + opaques	OSB 19		461.01
Underground Drill Drive	Altered		Pre-D2 at latest	Contact b/w amph and albitite and biotite schist	925 ISS / 795 ISS		
	Altered		Pre-D2 at latest	Highly strained	HONQ 29		185.37
	Unaltered		Pre-D2 at latest	Unaltered hbe rich amphibolite + plag + opaques	OSB 19		464.03
Underground Drill Drive	Altered		Pre-D2 at latest	Oikycrystic-hedenbergite-bearing amphibolite	925 ISS / 795 ISS		
	Unaltered		Pre-D2 at latest	Unaltered hbe rich amphibolite + plag + opaques	OSB 19		461.01
Underground Drill Drive	Altered		Pre-D2 at latest	Contact b/w amph and albitite and biotite schist	925 ISS / 795 ISS		
	Altered		Pre-D2 at latest	Highly strained	HONQ 29		185.37
	Unaltered		Pre-D2 at latest	Unaltered hbe rich amphibolite + plag + opaques	OSB 19		464.03
	Unaltered		Pre-D2 at latest				
	Altered		Pre-D2 at latest				
	Altered		Pre-D2 at latest				
	Unaltered		Pre-D2 at latest				
	Altered		Pre-D2 at latest				
	Unaltered		Pre-D2 at latest				
	Un/Alt		Pre-D2 at latest				
	Un/Alt		Pre-D2 at latest				
	Alt/Un		Pre-D2 at latest				
	Altered		Pre-D2 at latest				

	Unaltered		Pre-D2 at latest		MEQ94-85	98.60
	Altered		Pre-D2 at latest	albite-diopside-scapolite-biotite	MEQ94-85	128.00
Pit	Altered	bi-chl	pre or Syn-D1	pre-D2 tectonically emplaced		
Drill Core	Altered	bi-py	pre or Syn-D2	pre-D2 tectonically emplaced		
877658	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Corella Formation		
874637	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Corella Formation		
997561	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Corella Formation		
890640	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Argylla Formation		
917456	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Argylla Formation		
915457	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Argylla Formation		
906426	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Argylla Formation		
933448	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Wonga Granite		
937449	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Wonga Granite		
925453	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Wonga Granite		
939448	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Wonga Granite		
913507	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Wonga Granite		
246721	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Cone Creek Member Basalt		
257729	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Cone Creek Member Basalt		
464467	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Kuridala Formation		
470462	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Kuridala Formation		
478472	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Kuridala Formation		
471480	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Kuridala Formation		
509455	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Kuridala Formation		
510430	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Kuridala Formation		
640870	relatively Unaltered		Pre 1550 Ma	E2 Dolerite Dykes - intrudes Llewellyn Creek Formation		
663007	relatively Unaltered	Metasomatised	Pre 1550 Ma	E1 Dolerite Intrusion - intrudes Toole Creek Volcanics		
548922	relatively Unaltered		1740 Ma	E3 Dolerite Intrusion - intrudes Corella Formation		
482078	relatively Unaltered		1740 Ma	E3 Dolerite Intrusion - intrudes Corella Formation		
027047	relatively Unaltered		1740 Ma	E3 Dolerite Intrusion - intrudes Corella Formation		
	relatively Unaltered		Late	E4 Dolerite		
938448	relatively Unaltered		Late	E4 Dolerite - intrudes Wonga Granite		
997967	relatively Unaltered		Late	E4 Dolerite - intrudes Corella Formation		
035047	relatively Unaltered		Late	E4 Dolerite - intrudes Corella Formation		
502453	relatively Unaltered		Late	E4 Dolerite - intrudes Kuridala Formation		
508548	relatively Unaltered		Late	E4 Dolerite - intrudes Kuridala Formation		
532402	relatively Unaltered		Late	E4 Dolerite - intrudes Williams Batholith		
540462	relatively Unaltered		Late	E4 Dolerite - intrudes Doherty Formation		
894117	relatively Unaltered		Late	E4 Dolerite - intrudes Doherty Formation		
894117	relatively Unaltered		Late	E4 Dolerite - intrudes Doherty Formation		
858089	relatively Unaltered		Late	E4 Dolerite - intrudes Doherty Formation		
910420	Altered	Scapolite	Pre 1550 Ma	E2 Dolerite Dykes		
545060?	Altered	Scapolite	Pre 1550 Ma	E2 Dolerite Dykes		
	Unaltered		Probably Late		MFC015	114.30
	Unaltered		Probably Late		MFC015	158.70
	Unaltered		Probably Late		TT001	502.00
Maramungee Creek East			Pre-D2 at latest			
	Altered	Scapolite	Pre-D2 at latest			
			Pre-D2 at latest			
	Altered	Sericitised Fspar	Pre-D2 at latest			
Maramungee Creek East			Pre-D2 at latest			
	?	Ab veining	Pre-D2 at latest			
Maramungee Creek West	Altered	Scapolite and Ma	Pre-D2 at latest			
Maramungee Creek West			Pre-D2 at latest			
			Pre-D2 at latest			
	Alt?		Pre-D2 at latest			
	Altered	Scapolite and Ma	Pre-D2 at latest			

		Pre-D2 at latest
		Pre-D2 at latest
		Pre-D2 at latest
Altered	Scapolite and Ma	Pre-D2 at latest

Distance to mnz	SiO2	TiO2	Al2O3	Fe2O3T	MnO	MgO	CaO	Na2O	K2O	P2O5	S	F	LOI	Total	Ag	As	Au	Ba	Bi
	62.18	0.90	15.78	6.18	0.03	1.83	4.08	5.24	2.64	0.19	0.01	0.07	0.96	100.22		2		489	
	57.54	1.30	16.26	9.06	0.06	2.54	5.13	4.83	2.30	0.26	0.01	0.04	0.12	99.57		1		391	
	59.10	1.14	15.40	7.69	0.05	2.29	4.97	4.82	2.40	0.22	0.02	0.09	0.95	99.27		1		448	
	61.42	0.94	16.21	6.21	0.04	2.23	2.53	7.68	1.59	0.20		0.18	1.11	100.43		2		217	
	56.44	1.56	16.29	9.49	0.11	2.32	3.61	7.79	0.78	0.48		0.10	0.87	99.94		3		134	
	58.80	0.85	18.37	6.25	0.07	1.79	2.65	8.93	0.59	0.25		0.14	1.12	99.90		4		139	
	56.91	1.07	15.88	8.50	0.11	4.64	4.50	6.45	1.39	0.16		0.06	0.93	100.73		1		283	
	56.76	1.08	15.55	9.40	0.13	4.55	4.74	4.76	2.15	0.22	0.01	0.09	1.30	100.89		2		458	
	51.02	1.41	13.31	13.64	0.21	6.23	8.75	3.73	0.23	0.12			0.38	99.62				81	
	49.82	1.80	13.65	15.35	0.20	5.74	7.50	4.23	0.27	0.16			1.42	98.58				38	
	50.85	1.35	13.60	12.97	0.18	6.54	9.31	3.22	0.43	0.12			0.70	99.30				51	
	48.59	1.34	12.01	15.41	0.20	8.03	9.55	2.77	0.35	0.04			0.28	99.72				45	
	48.97	1.53	13.87	14.22	0.17	5.97	8.80	3.93	0.28	0.13			0.43	99.57				58	
	49.26	1.30	14.55	13.16	0.20	6.32	9.20	2.91	0.71	0.09			0.77	99.23				117	
	49.44	1.19	15.62	11.51	0.18	6.80	10.12	2.84	0.50	0.10			0.70	99.30				67	
	47.24	0.80	15.73	11.02	0.10	8.54	7.75	3.52	2.80	0.06			1.50	98.50				277	
	48.30	0.94	14.51	12.01	0.10	7.10	8.38	4.32	1.79	0.07			1.04	98.96				166	
	47.24	0.80	15.73	11.02	0.10	8.54	7.75	3.52	2.80	0.06			1.50	98.50				277	
	48.30	0.94	14.51	12.01	0.10	7.10	8.38	4.32	1.79	0.07			1.04	98.96				166	
	52.70	0.62	17.97	5.53	0.06	3.07	8.52	6.94	0.92	0.04			1.34	98.66				71	
	49.40	1.30	14.11	12.31	0.12	6.43	8.70	4.53	1.07	0.11			0.64	99.36				85	
	48.50	1.02	15.16	10.88	0.09	4.70	9.40	5.41	1.06	0.13			1.40	98.60				56	
	48.49	1.07	15.46	11.55	0.12	5.71	9.11	4.39	1.25	0.07			1.03	98.97				82	
	49.10	1.74	12.90	19.90	0.26	5.55	7.17	2.29	0.87	0.16			0.01	100.20				62	
	46.20	1.67	13.20	20.50	0.28	5.30	7.93	3.19	0.44	0.14			0.28	99.10				202	
	48.80	1.42	13.10	18.50	0.26	6.26	6.81	3.37	0.21	0.13	0.01		0.30	99.20				9	
	48.40	1.49	13.50	16.20	0.30	6.65	9.00	3.42	0.28	0.12			0.50	99.90				66	
	49.40	1.26	14.10	15.50	0.20	5.57	9.55	2.91	0.87	0.13			0.68	100.20				81	
	48.70	1.45	13.90	13.90	0.21	7.05	11.30	2.56	0.64	0.13			0.69	100.50				121	
	49.30	1.70	13.60	17.00	0.36	6.12	9.62	1.17	0.57	0.15			0.84	100.50				179	
	47.20	1.87	13.00	18.40	0.42	5.75	9.24	3.32	0.40	0.16	0.01		0.19	99.90				97	
	50.50	1.01	12.20	11.40	0.17	7.67	10.20	3.46	0.89	0.41	0.20		1.58	99.70				592	
	70.50	0.44	12.50	5.81	0.08	0.89	2.02	6.21	0.27	0.08			0.30	99.20		5		50	
	69.60	0.54	12.50	7.10	bd	0.50	1.31	6.99	0.25	0.12	0.01		0.11	99.00		4		93	
	70.00	0.68	13.40	7.14	bd	0.42	1.73	6.62	0.30	0.15			0.03	100.50		3		15	
	46.20	1.67	13.20	20.50	0.28	5.30	7.93	3.19	0.44	0.14			0.28	99.10				28	
	47.10	1.60	15.50	15.50	0.12	5.12	8.89	2.86	1.81	0.07			1.51	100.10				99	
	47.90	1.42	14.80	15.50	0.25	6.56	9.46	3.05	0.66	0.12	0.01		0.60	100.30				132	
	48.90	2.04	12.80	17.60	0.23	4.08	7.30	3.80	1.52	0.19	0.01		0.97	99.40				432	
	49.70	1.12	15.20	10.90	0.15	6.76	11.20	2.88	1.63	0.09			1.42	100.90				243	
	47.38	1.39	12.90	15.40	0.14	7.29	9.43	2.46	1.85	0.09	0.01		1.47	100.20				441	
	49.36	3.16	14.03	10.55	0.17	1.24	16.78	1.68	0.48	0.36				97.81					
	62.70	2.13	10.57	8.93	0.23	1.12	10.49	1.13	1.59	0.38				99.27					
	42.48	2.81	13.75	14.49	1.29	1.74	18.84	0.37	0.25	0.24				96.27		4			
	36.85	2.61	14.72	19.26	1.17	3.59	14.90	0.63	1.23	0.35			0.59	95.28					
	37.61	1.83	14.00	18.31	1.50	3.25	15.38	0.33	0.35	0.35				92.91					
	47.97	0.86	15.60	14.64	0.64	2.39	12.90	1.80	1.03	0.12				97.93		6			
	58.62	1.22	11.75	10.74	0.55	1.72	12.91	1.02	0.31	0.29				99.12		7			
	58.77	0.80	12.87	14.53	0.66	1.90	8.71	0.24	0.87	0.07				99.25					
	47.93	1.37	16.11	13.19	0.28	4.12	8.44	3.66	1.48	0.13			1.43	98.13		5		335	
	47.66	1.59	13.23	16.00	0.41	5.85	9.57	2.46	0.47	0.14			0.42	97.80		5		69	
	48.58	2.10	14.04	14.48	0.50	4.39	10.74	2.48	0.49	0.14			0.36	98.31		5		85	

	47.43	1.16	14.05	14.39	0.42	6.76	10.83	1.98	0.31	0.10	0.81	98.24	5	188
	48.13	1.45	13.26	14.59	0.62	5.80	11.17	1.65	0.77	0.12	0.56	98.13	5	151
	48.24	1.42	14.34	14.80	0.40	5.94	9.91	2.45	0.58	0.13	0.72	98.92	5	666
	48.94	1.37	12.23	14.22	0.38	7.08	11.76	1.68	0.50	0.12	0.75	99.04	5	83
	47.86	1.31	14.93	12.90	0.37	5.53	11.42	2.14	0.60	0.12	0.92	98.09	5	164
22.00	48.50	2.03	13.58	15.67	0.25	5.68	9.19	1.99	1.16	0.20		98.25	5	
17.00	48.53	1.40	13.64	14.13	0.22	5.94	10.57	2.47	0.95	0.14		97.99	5	
8.50	48.61	1.80	13.57	15.04	0.21	5.37	10.86	2.30	0.74	0.17		98.65	5	
7.00	49.34	2.25	13.23	16.21	0.26	5.07	8.76	2.81	0.59	0.29		98.81	7	
6.00	47.85	1.88	13.73	18.08	0.25	5.94	5.85	0.63	3.03	0.19		97.44	5	
-15.00	48.06	2.77	12.93	17.75	0.42	6.19	8.35	0.53	1.24	0.26		98.51	5	
-17.00	49.00	1.59	13.75	15.76	0.24	6.01	10.55	0.87	1.00	0.14		98.92	5	
104.50	44.61	1.52	14.04	16.12	0.24	7.28	10.98	2.14	0.70	0.08		97.71	5	
64.50	44.38	1.34	13.87	16.19	0.33	5.68	11.39	2.70	0.82	0.12		96.82	5	
50.00	49.26	1.41	13.45	15.53	0.25	6.43	9.70	1.21	0.95	0.12		98.32	5	
42.00	48.09	1.52	13.30	15.14	0.22	6.11	10.79	1.99	0.75	0.13		98.04	5	
6.00	47.31	2.88	12.71	18.77	0.44	6.28	7.50	0.51	1.56	0.28		98.23	9	
1.00	45.90	2.27	12.52	18.14	0.35	6.74	9.09	0.80	1.57	0.19		97.56	7	
-3.50	47.96	3.07	13.42	18.24	0.34	4.98	5.94	0.42	2.93	0.32		97.62	13	
-14.00	46.16	1.47	13.89	16.34	0.29	7.15	8.75	1.59	1.38	0.13		97.13	5	
136.50	49.36	1.81	14.22	17.32	0.24	3.42	6.74	3.10	1.21	0.21		97.63	5	
134.50	52.52	1.79	13.45	18.53	0.18	4.44	4.39	1.57	1.52	0.30		98.69	5	
122.00	47.75	1.96	15.47	16.55	0.39	5.87	2.75	0.59	4.67	0.11		96.11	5	
118.00	51.03	2.32	12.14	18.05	0.30	4.24	7.49	2.17	0.56	0.25		98.57	5	
110.00	49.07	2.78	12.83	18.82	0.25	4.41	6.45	0.96	2.21	0.26		98.04	5	
21.00	48.76	3.20	12.85	19.09	0.37	5.05	5.41	0.51	2.88	0.36		98.49	5	
15.00	48.25	0.95	14.26	12.89	0.22	7.30	10.24	2.12	1.36	0.08		97.66	5	
	48.07	1.41	13.25	15.84	0.28	6.26	9.53	1.97	0.99	0.12		97.71	5	
8.50	48.94	2.44	13.29	19.20	0.37	5.85	5.19	0.51	1.48	0.23		97.49	6	
5.00	48.73	1.13	13.95	14.43	0.25	6.44	10.31	0.66	1.47	0.10		97.45	5	
-29.00	47.27	1.51	13.56	14.17	0.20	6.45	11.61	2.30	0.40	0.14		97.60	5	
116.00	48.52	1.32	13.47	14.23	0.20	6.64	11.21	2.39	0.39	0.11		98.47	5	
96.50	47.86	1.51	13.37	14.99	0.21	6.37	10.96	2.35	0.60	0.11		98.33	5	
88.50	47.98	2.05	14.39	15.10	0.27	5.36	9.07	1.90	1.31	0.16		97.59	5	
57.00	48.00	1.43	13.50	14.44	0.24	6.34	10.47	2.57	0.54	0.12		97.65	5	
22.00														
17.00														
8.50														
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5.00														
-29.00														
116.00														
96.50														
88.50														
57.00														
	48.90	1.27	13.38	15.56	0.29	7.41	10.07	2.12	0.74	0.10	0.01	0.72	100.53	36
	48.46	1.25	13.41	15.64	0.36	7.38	9.96	1.59	1.65	0.10	0.03	0.63	100.47	16
	46.78	1.24	12.60	17.64	0.31	7.99	7.53	1.21	2.39	0.10	0.02	1.28	99.11	90
	48.25	1.20	13.01	15.67	0.32	7.68	9.71	1.52	1.71	0.09	0.07	0.96	100.19	67
	48.44	1.01	11.89	13.19	0.25	7.70	12.29	1.72	1.44	0.08	0.07	1.02	99.11	26
	48.80	1.35	13.41	15.77	0.25	7.31	9.82	2.45	0.68	0.10	0.01	0.51	100.46	29
	48.40	1.60	13.73	16.47	0.30	6.15	9.61	2.36	0.98	0.11	0.01	0.49	100.21	33
	35.96	1.23	15.09	29.93	0.47	6.29	5.65	0.47	1.94	0.09	0.06	2.05	99.23	182
	49.27	1.09	13.76	13.09	0.23	7.80	9.34	1.15	2.47	0.08	0.06	1.75	100.09	12
	49.23	1.24	13.14	14.89	0.34	7.67	8.53	1.32	1.60	0.10	0.02	1.52	99.61	196
	48.91	1.20	13.15	14.01	0.24	8.45	10.14	1.96	0.74	0.08	0.02	1.34	100.26	18
	49.16	1.11	12.94	13.61	0.25	8.60	10.65	1.76	1.38	0.09	0.05	0.84	100.44	7
	48.54	1.36	13.96	14.87	0.32	6.64	9.11	2.59	1.47	0.12	0.05	1.00	100.03	30
	49.18	1.39	15.06	13.36	0.22	6.43	10.40	2.65	0.65	0.11	0.01	0.79	100.25	18
	49.51	1.18	13.79	13.45	0.24	7.57	10.08	1.87	1.11	0.10	0.04	1.14	100.08	27
	53.03	1.04	13.41	12.89	0.33	5.69	9.49	1.66	1.61	0.10	0.02	1.28	100.54	34
	48.71	1.20	13.42	13.81	0.24	8.10	10.31	1.87	1.09	0.10	0.02	0.97	99.84	62

51.81	1.14	9.43	12.44	0.27	10.70	9.51	2.16	0.86	0.07			2.21	100.61	12		
48.92	1.13	13.77	13.40	0.23	7.67	11.30	1.96	0.90	0.09	0.06		0.89	100.31	8		
48.50	1.18	13.03	13.94	0.25	8.73	10.14	2.15	0.75	0.10	0.03		1.27	100.07	276		
49.29	1.24	14.17	14.28	0.30	6.91	11.73	1.79	0.46	0.10	0.03		0.32	100.64	11		
49.93	1.25	12.34	13.58	0.25	6.65	12.30	1.75	0.49	0.11	0.04		0.29	99.00	12		
48.72	1.26	12.66	14.28	0.25	5.99	11.80	2.18	0.80	0.10	0.10		0.81	98.95	5		
45.48	1.60	14.84	17.56	0.33	6.09	10.10	1.93	1.40	0.11	0.10		0.67	100.22	5		
49.01	1.61	14.75	16.07	0.28	4.95	9.93	2.50	0.85	0.12	0.06		0.37	100.49	8		
43.70	1.71	13.55	19.00	0.31	5.18	9.67	2.84	1.10	0.15	0.14		1.49	98.84	17		
51.18	1.70	16.11	15.56	0.27	3.13	8.87	2.69	0.79	0.17	0.01		0.10	100.58	5		
54.29	1.90	13.73	15.52	0.34	2.78	8.14	2.66	0.78	0.22	0.03		0.15	100.52	6		
51.14	1.65	16.05	15.47	0.32	3.08	8.39	2.85	1.17	0.14	0.04		0.34	100.63	5		
48.75	1.26	13.84	13.92	0.22	7.51	12.03	1.94	0.44	0.10	0.08		0.56	100.64	7		
48.81	1.09	14.13	14.89	0.25	6.84	11.12	2.12	0.57	0.09	0.05		0.35	100.31	5		
48.44	1.40	14.48	17.09	0.27	5.44	8.63	2.28	1.14	0.11	0.05		0.72	100.05	5		
49.08	1.39	15.87	14.01	0.26	5.18	11.58	1.58	0.67	0.12	0.03		0.31	100.07	5		
48.64	1.26	13.50	15.32	0.29	7.04	10.84	1.68	1.12	0.10	0.03		0.61	100.43	19		
49.02	1.22	13.35	14.32	0.27	7.65	9.36	1.62	1.49	0.09	0.01		1.43	99.82	56		
48.72	1.18	12.95	13.66	0.26	7.78	9.43	2.22	1.24	0.10	0.04		2.43	100.01	16		
49.04	1.14	13.83	13.85	0.27	7.49	11.49	1.87	0.76	0.10	0.01		0.73	100.57	7		
48.64	1.34	14.38	15.42	0.32	6.05	9.66	2.26	1.07	0.12	0.01		0.77	100.04	6		
50.23	1.71	14.85	16.17	0.28	3.88	9.20	2.63	0.67	0.16			0.20	99.98	5		
50.29	1.70	14.76	16.37	0.28	3.65	8.38	2.79	0.97	0.17	0.01		0.80	100.16	5		
49.83	1.74	16.39	15.43	0.27	3.29	9.04	3.14	0.82	0.15	0.02		0.34	100.46	12		
49.44	1.29	13.87	14.17	0.24	6.83	10.88	2.38	0.75	0.10	0.04		0.55	100.54	11		
48.43	1.59	12.83	15.18	0.19	6.11	9.27	4.05	0.38	0.13			1.15	99.32	5		
47.91	1.76	12.92	14.01	0.08	5.72	8.94	4.41	0.32	0.13			0.76	96.92	7		
46.87	1.63	13.03	16.32	0.16	7.27	7.04	2.55	0.72	0.13			3.00	98.72	5		
47.93	1.60	12.74	15.15	0.11	6.65	7.62	3.20	0.70	0.14			3.13	98.96	5		
47.35	1.57	12.58	15.04	0.20	6.16	9.50	3.75	0.50	0.13			1.36	98.13	5		
48.86	1.65	12.17	18.76	0.07	8.27	0.77	1.37	3.74	0.14			4.57	98.37	5		
49.10	1.48	13.51	13.34	0.08	6.05	5.71	4.74	0.26	0.13			3.39	97.79	5		
48.59	1.52	13.60	15.75	0.19	6.74	9.02	3.47	0.55	0.13			1.05	100.64	5		
48.60	1.54	13.45	16.14	0.20	6.59	9.13	2.69	0.67	0.13			1.15	100.30	8		
44.71	1.06	18.50	11.00	0.20	3.95	16.87	0.84	1.67	0.14			2.19	101.12			425
47.59	1.77	13.30	16.07	0.20	5.14	12.12	1.11	0.53	0.17			0.66	98.67			245
50.66	0.50	18.78	6.11	0.10	5.81	10.96	3.02	1.27	0.11			2.53	99.85			653
50.29	0.69	16.74	8.07	0.12	7.08	11.91	2.43	1.20	0.09			0.97	99.59			684
72.00	0.22	14.20	0.95	0.00	0.23	0.35	6.92	0.21	0.05	0.00	0.02	3.27	98.42	0		
71.44	0.21	15.60	2.42	0.01	1.13	0.23	8.00	0.66	0.05	0.01	0.02	0.91	100.70	1		
48.11	1.52	14.18	25.23	0.02	1.08	2.10	5.70	3.15	0.12	0.04	0.00	0.45	101.67	2		
49.15	1.53	12.60	21.64	0.05	4.68	0.51	4.02	0.70	0.19	0.01	0.04	3.55	98.67	0		
48.41	1.49	14.11	20.84	0.03	4.91	0.45	4.91	0.17	0.25	0.00	0.03	3.58	99.17	0		
52.11	0.55	13.32	6.35	0.08	4.37	8.11	2.18	4.41	0.14	0.02	0.00	8.50	100.13	1		
60.04	0.72	16.01	6.46	0.03	2.92	2.05	3.01	5.41	0.16	0.00	0.00	4.01	100.81	1		
39.72	1.12	15.55	19.27	0.07	6.56	5.80	3.60	1.32	0.09	0.08	0.00	4.99	98.15	1		
45.50	1.05	15.74	13.34	0.05	5.07	5.27	2.91	4.41	0.11	0.22	0.00	4.93	98.58	0		
56.21	1.15	16.21	5.77	0.02	2.57	4.10	7.21	1.26	0.23	0.01	0.00	2.89	97.62	1		
48.12	0.98	15.14	12.61	0.02	2.51	5.88	4.53	4.43	0.11	0.31	0.00	4.20	98.84	0		
															-5.00	
															-5.00	
															-5.00	
															38.10	
															62.20	
															88.30	
46.10	2.14	12.10	16.06	0.07	4.44	10.35	4.12	1.40	0.18			2.48	99.30	2		

47.90	1.66	12.80	14.81	0.08	5.69	8.65	3.42	1.79	0.13			2.07	99.00	1	
47.60	1.53	13.30	15.57	0.19	6.17	9.64	2.78	1.61	0.10	0.01		0.97	99.40	2	
46.40	1.88	12.80	16.71	0.17	6.12	8.99	2.88	1.94	0.08	0.01		1.29	99.30	2	
47.50	2.22	11.70	15.53	0.06	4.14	11.63	4.00	1.17	0.21		0.09	1.94	100.00	2	
46.30	2.09	11.90	18.11	0.12	7.36	4.83	3.31	2.53	0.11	0.04	0.35	1.11	98.20	1	
49.50	1.22	12.40	11.11	0.09	7.08	9.81	3.63	2.12	0.06			2.30	99.30	1	
41.40	1.49	16.60	16.67	0.07	7.20	3.89	3.64	4.00	0.06	0.05	0.40	0.87	96.30	1	
47.80	1.10	14.80	12.81	0.14	7.06	11.04	2.41	1.27	0.06	0.01		0.95	99.40	4	
48.72	1.49	14.22	15.35	0.29	6.20	9.90	1.46	0.87	0.11	0.01		0.84	99.46	32	
48.11	1.48	14.24	14.78	0.33	6.32	9.11	2.16	1.63	0.11	0.02		1.05	99.33	40	
47.75	1.42	13.66	13.96	0.20	6.45	10.67	2.92	1.17	0.10	0.01		1.21	99.52	9	
47.76	1.47	14.11	14.95	0.25	6.18	10.04	2.45	0.92	0.11	0.02		0.87	99.12	15	
49.20	1.47	14.15	14.82	0.23	6.42	11.09	1.25	0.44	0.11	0.01		0.43	99.62	14	
49.48	1.17	14.70	13.78	0.20	5.68	7.86	5.14	0.48	0.08	0.02		0.35	98.92		
46.70	1.23	14.50	15.05	0.17	7.21	7.26	4.49	0.79	0.09	0.02		1.51	98.90		
47.80	1.23	14.30	15.53	0.24	6.39	8.22	4.85	0.73	0.10	0.02		0.47	99.70	0	
48.50	1.22	14.37	14.40	0.18	7.61	6.54	4.69	1.29	0.08		0.01	0.55	99.44	2	
47.60	1.62	13.30	13.23	0.06	5.70	10.14	5.08	0.94	0.16	0.02		1.02	98.80	4	
48.02	1.67	13.36	12.66	0.07	6.06	10.20	4.78	1.02	0.14		0.06	0.79	98.84	1	
49.79	1.74	13.68	8.94	0.07	5.80	11.80	4.62	1.40	0.16		0.01	1.64	99.63	1	
51.00	1.96	13.40	7.40	0.06	6.12	11.82	4.97	1.06	0.19		0.04	1.49	99.50	2	
52.32	1.94	13.49	5.09	0.07	5.78	13.03	4.95	1.26	0.17	0.00		1.76	99.86	1	
47.17	1.74	12.99	13.48	0.08	5.59	10.28	4.70	1.49	0.16			1.27	98.95	1	
52.94	1.93	13.60	4.75	0.06	5.74	12.41	5.27	1.09	0.17		0.00	1.21	99.15	1	
52.35	1.96	13.84	4.85	0.06	5.89	12.21	5.17	1.28	0.17			2.02	99.79	2	
54.37	1.99	13.97	3.96	0.04	5.95	10.73	5.81	0.73	0.17		0.06	1.25	99.04	1	
47.89	1.66	12.80	14.81	0.08	5.69	8.65	3.43	1.79	0.13			2.07	98.99	1	
47.64	1.53	13.27	15.57	0.19	6.17	9.64	2.78	1.61	0.10	0.01		0.97	99.47	2	
46.40	1.88	12.84	16.71	0.17	6.12	8.99	2.88	1.94	0.09	0.01		1.29	99.30	2	
47.40	1.18	13.40	13.13	0.09	6.27	8.74	4.78	1.72	0.09	0.03		1.67	98.60	0	
46.90	1.65	12.70	14.42	0.11	5.89	9.62	3.43	1.98	0.11		0.00	3.15	99.90	2	
53.30	1.86	13.20	4.79	0.07	5.30	13.29	4.92	1.07	0.11			2.26	100.10	1	
49.33	2.31	12.55	19.58	0.26	3.60	6.04	3.74	1.52	0.20			0.25	99.40	5	237
49.12	1.59	13.33	16.54	0.26	5.41	7.51	3.86	0.77	0.14			0.93	99.50	11	28
49.18	2.03	12.15	18.42	0.21	4.84	6.51	2.78	1.99	0.16			0.83	99.06	5	310
49.41	1.84	12.78	17.44	0.33	5.01	7.26	3.82	0.69	0.14			1.09	99.82	5	67
48.60	1.55	13.30	14.42	0.18	6.70	9.84	4.23	0.41	0.13			0.81	100.20	3	204
48.90	2.72	12.70	19.30	0.28	4.04	7.04	3.85	0.57	0.29	0.02		-0.06	99.60		102
49.50	1.58	13.60	14.10	0.18	6.51	8.55	9.18	0.41	0.14	0.01		0.69	100.10		44
49.70	1.21	14.60	14.30	0.26	6.72	10.34	2.15	0.83	0.10	0.01		0.82	101.10	2	87
51.30	2.52	13.10	17.10	0.30	3.74	7.19	3.94	0.48	0.31			-0.29	99.70		98
														1.06	
														4.27	
														5.06	168
47.31	1.67	12.50	16.57	0.14	5.72	8.85	4.49	0.21	0.06			2.17	99.69	1	127
56.39	1.52	15.28	4.40	0.05	2.01	9.84	6.64	0.02	0.02			3.07	99.24	1	-100
45.61	1.60	14.08	11.17	0.01	4.14	19.93	1.83	0.01	0.03			2.16	100.68	2	-100
46.90	1.69	13.23	16.17	0.18	6.45	8.30	3.76	1.06	0.07			2.30	100.13	1	-100
52.89	2.01	11.94	5.12	0.10	4.77	14.05	3.75	1.31	0.02			3.10	99.06	1	112
49.05	1.20	14.89	12.18	0.14	5.44	10.22	3.96	0.57	0.11			1.05	98.78	1	-100
48.59	1.42	13.97	12.92	0.12	6.27	10.13	4.84	0.75	0.06			1.92	101.01	1	120
50.45	1.13	15.90	10.84	0.13	6.55	1036.00	3.25	1.11	0.09			1.82	101.62	1	200
49.23	1.59	12.32	14.04	0.14	6.18	11.25	2.94	1.25	0.09			1.70	100.74	1	137
54.01	1.49	14.12	10.14	0.13	5.49	7.74	2.57	4.68	0.13			1.83	102.33	3	1450

48.70	1.49	14.20	15.35	0.29	6.20	9.90	1.46	0.87	0.11			0.84	99.41			32		
47.50	2.22	11.70	15.53	0.06	4.14	11.63	4.00	1.17	0.21		0.09	1.94	100.19			-3		
49.54	0.36	13.95	9.59	0.14	11.25	9.60	2.68	0.50	0.03	0.01		2.08	99.73			1		
43.22	0.54	15.99	17.67	0.17	8.68	7.69	3.01	0.68	0.04	0.06		2.98	100.73			2		
51.15	1.32	14.85	13.14	0.23	6.32	11.22	1.82	0.94	0.13									190
50.25	1.35	14.83	13.80	0.25	7.09	10.47	2.40	0.68	0.13									129
51.21	1.10	14.24	13.47	0.22	6.75	10.85	2.51	0.66	0.11									426
51.32	1.49	13.71	14.83	0.19	5.97	9.04	3.07	1.29	0.16									325
49.56	2.70	12.89	17.81	0.15	4.79	8.69	3.24	1.06	0.31									170
50.41	2.42	13.33	14.91	0.10	5.46	8.68	4.49	0.79	0.30									72
50.18	1.36	16.23	11.97	0.14	6.14	10.99	2.99	0.80	0.13									97
52.80	2.05	13.61	12.64	0.14	6.14	8.26	4.11	0.98	0.20									90
50.90	1.75	13.37	16.59	0.22	5.68	9.44	2.39	0.81	0.19									272
51.09	1.55	13.98	11.92	0.19	6.27	11.53	3.43	0.85	0.14									288
53.96	0.83	14.43	10.78	0.15	6.65	9.42	2.37	2.14	0.14									333
50.25	2.79	13.76	13.96	0.14	5.15	10.81	3.16	0.75	0.34									109
49.20	1.04	15.05	13.79	0.20	9.42	9.81	2.13	0.50	0.08									139
49.33	1.43	15.89	14.03	0.18	6.35	10.51	2.85	0.33	0.11									211
49.06	0.87	15.43	12.10	0.19	8.13	13.33	1.63	0.22	0.06									49
49.88	0.90	14.72	12.98	0.20	7.64	12.34	1.61	0.81	0.08									96
50.08	0.91	16.23	12.08	0.19	6.83	10.98	2.78	0.95	0.07									130
49.59	1.27	14.31	14.38	0.23	7.44	10.85	2.61	0.48	0.01									79
50.43	1.77	14.42	16.01	0.19	4.76	9.76	3.06	0.68	0.17									158
54.25	1.89	11.58	16.42	0.28	3.31	8.67	4.08	0.39	0.49									82
50.39	1.66	13.27	16.81	0.20	5.80	9.83	2.87	0.36	0.14									273
49.49	1.65	13.88	15.46	0.21	6.12	10.47	3.54	0.44	0.15									82
46.43	2.09	12.33	20.21	0.17	6.24	9.77	2.18	0.78	0.09									116
50.71	1.33	14.70	14.30	0.12	6.14	10.00	2.85	0.79	0.12									198
53.67	1.09	16.05	10.74	1.14	5.31	8.60	2.70	2.31	0.15									481
49.30	2.66	14.20	16.68	0.24	4.74	10.02	2.15	0.86	0.40									265
51.23	0.48	15.20	10.20	0.16	11.74	9.60	1.19	1.08	0.06									173
48.80	2.69	12.84	17.65	0.25	5.99	10.01	2.00	0.72	0.36									228
48.92	2.60	13.33	16.90	0.24	5.83	9.99	2.37	0.75	0.39									189
50.67	1.24	14.36	12.56	0.18	7.34	10.70	2.20	1.61	0.10									111
51.05	1.90	14.21	12.19	0.18	7.84	11.29	1.98	0.93	0.10									188
51.05	1.26	14.51	12.61	0.19	7.18	10.53	2.00	1.50	0.11									156
50.88	1.21	14.37	12.56	0.19	7.42	10.43	1.82	1.98	0.11									427
51.78	1.82	13.87	12.75	0.20	6.89	9.11	2.34	1.99	0.17									497
51.27	1.80	13.74	12.79	0.19	7.20	10.24	2.10	1.45	0.16									215
51.34	3.50	13.60	16.26	0.20	4.39	6.74	2.76	1.95	0.35									387
48.11	1.36	13.03	13.33	0.08	6.40	9.00	4.11	1.15	0.18				96.98					58
44.71	2.26	12.05	19.36	0.21	5.54	9.19	3.05	0.72	0.12				97.34					256
47.5	2.02	11.7	17.47	0.2	7.35	11.25	2.22	0.41	0.09							4		
48.1	1.89	12.7	16.69	0.2	6.87	11.23	2.36	0.41	0.09							3		
48.8	0.52	17.9	7.38	0.11	8.08	10.65	2.62	0.42	0.07							1		
49.59	1.55	13.19	16.03	0.25	5.84	8.59	0.72	1.20	0.10			2.43	99.49			1		
47.24	1.63	12.90	14.84	0.11	6.72	11.10	3.15	0.99	0.11			1.39	100.18			1		
49.38	1.42	14.24	12.97	0.16	5.53	10.67	4.01	0.71	0.18			1.03	100.30			1		
48.43	1.78	14.07	15.67	0.11	5.60	8.83	3.98	0.87	0.15			1.90	101.39			2		
48.02	1.24	13.57	13.06	0.16	6.14	9.44	3.90	1.06	0.09			1.74	98.42			3		
48.90	1.79	12.53	15.50	0.16	5.76	8.71	2.43	0.85	0.14			1.50	98.27			1		
48.47	1.33	13.49	14.06	0.16	5.36	9.76	3.16	0.85	0.10			1.07	97.81			1		
48.69	1.19	14.47	12.35	0.15	6.37	11.18	3.48	0.84	0.07			0.72	99.51			1		
54.87	2.20	13.08	6.58	0.06	7.06	8.08	5.34	0.43	0.08			1.64	99.42			1		
52.16	1.56	14.03	12.96	0.15	4.35	9.97	2.62	1.48	0.11			1.89	101.28			2		
61.97	0.61	14.28	5.28	0.03	3.27	4.13	4.24	4.75	0.13			1.11	99.80			1		142

60.70	0.60	12.73	4.27	0.05	4.71	9.10	6.96	0.18	0.09	0.95	100.34	
54.94	1.40	13.72	8.82	0.08	7.77	7.87	4.41	1.45	0.05	2.39	102.90	1
47.23	1.15	13.14	12.31	0.07	7.36	10.60	4.66	0.72	0.05	1.19	98.48	2
55.55	0.51	16.54	5.26	0.04	5.24	9.04	7.22	0.70	0.06	2.36	102.52	1

Br	C	Ca(%)	Ce	Cl	Co	Cr	Cs	Cu	Eu	Fe (%)	Ga	Gd	Hf	Ho	Ir	K (%)	La	Lu	Mn	Na(%)	Nb
			88	2889	13	8	1	20	1.75		21		5				41	0.47	264		16
			58	1102	25	11	-1	26	1.52		22		5				34	0.43	405		15
			81	1785	22	10	-1	20	1.81		22		5				50	0.49	346		15
			73	229	13	8	-1	21	1.47		24		8				40	0.57	287		17
			91	290	26	7	1	38	2.11		28		7				51	0.56	725		22
			82	514	10	12	-1	23	3.56		27		6				53	0.35	535		12
			57	540	30	72	-1	38	1.47		22		5				32	0.39	826		13
			70	645	33	62	-1	39	1.49		22		5				40	0.39	968		13
			21	1969	80	31		10			19										
			50	1754	78	51		72			19										
			41	2286	67	189		20			20										
			16	2756	70	541		149			16										
			22	2736	65	209		16			18										
			7	1746	72	336		91			16										
			49	1400	68	522		94			17										
			33	8925	68	58		27			19										
			19	12663	70	53		13			15										
			33	8925	68	58		27			19										
			19	12663	70	53		13			15										
			22	20027	78	39		15			11										
			28	6605	66	220		57			17										
			29	15174	37	206		9			13										
			27	8093	69	229		22			14										
					52	11		15			25								2076		7
			11.7		47			196	1.12		23			0.82			4.44	0.31	1481		4
					41	119		15			22								2047		7
					53	132		127			20								2275		6
					46	2		106			20								1557		6
			18.1		57	133		166	1.07		21			0.98			7.5	0.3	1484		7
					56	49		112			21								2704		7
					39			20			23								3221		7
			88.4		40	91		117	1.87		18			1.81			43.3	0.49	1196		7
					28	52					22								569		19
			65		24	44		15	2.47		24			2.94			28.9	1.07	267		15
					45	38		6			23								276		27
					55	482		11											1884		4
					53			170			22								1072		3
			19.8		59	32		194	1.14		22			1.01			8.6	0.32	1708		5
					53			130			24								1655		11
					57	107		161			19								1168		3
					54	75		261			19								1060		3
						7					21								1286		17
						5					17								1613		16
						128					19								9538		13
						89					28								8282		18
						66					20								11573		13
						36					28								5061		5
						3					21								4100		13
						84					17								4688		8
						27					23								2179		7
						56					22								3102		6
						0					24								3720		7

104	21	3027	7
103	20	4402	6
50	22	2872	6
173	20	3053	7
49	21	2845	6
			12
75	21	2571	7
102	22	1694	10
65	20	1940	14
14	23	1992	11
87	21	3128	12
101	19	1729	11
131	22	1976	9
81	20	1891	8
95	18	2003	7
79	19	1770	8
94	22	3231	12
115	22	2702	11
79	25	2488	18
114	20	2345	10
1	25	1704	10
1	24	1332	16
59	22	2999	16
14	22	2237	14
16	23	1946	14
13	23	2653	15
168	16	1761	5
69	20	2294	6
77	22	2899	11
131	19	1996	6
			8
62	19	1643	7
114	19	1749	8
50	21	2039	9
113	19	1921	7

31	2	7	2	15	1
30	2	8	2	14	1

14		1	4		1	7	0
29	10	2		4		11	1
22		1		2		8	0
23	3	2		3		8	0
29	10	2		4		11	0
41	7	2		5		15	1
11		1		1		3	0

65	122	160	16	2297	6
61	135	8	17	2946	6
54	145	26	18	2469	7
71	145	434	21	2648	6
64	162	159	17	2025	5
72	32	185	18	2000	6
72	10	117	18	2207	7
62	161	546	40	2963	11
58	143	78	16	1906	6
55	117	163	28	2412	5
58	158	118	16	2033	7
64	219	89	15	2112	6
60	33	130	20	2653	7
62	58	112	19	1788	7
60	149	121	18	1939	6
46	104	28	20	2771	11
60	169	121	16	2020	7

	42	230		2		12				2275	7
	62	175		149		16				1917	6
	56	177		125		17				1984	6
	69	100		143		17				2483	6
	73	119		91		16				1933	7
	66	70		143		17				1925	7
	67	9		130		18				2586	8
	68	10		125		19				2190	7
	67	7		218		22				2336	8
	60	8		38		22				1820	9
	61	1		74		23				2417	12
	59	8		47		21				2205	9
	68	133		158		15				1757	6
	68	119		101		17				1984	8
	62	18		324		19				2068	7
	62	20		49		17				2080	7
	65	117		160		16				2444	7
	65	145		108		15				2196	6
	60	138		130		15				2184	6
	65	125		96		15				2245	6
	72	14		145		18				2516	7
	61	11		49		20				2148	9
	64	20		17		20				2143	9
	60	9		81		21				1944	7
	68	112		126		17				1928	7
		84				22					8
		130				21					9
		84				23					8
		78				24					8
		79				22					7
		74				24					7
		148				29					10
		104				25					8
		92				24					8
		177				35				1681	24
		114				23				1659	9
		257				20				803	2
		101				18				964	3
	7	22				9				18	9
	28	31				16				98	13
	86	16				31				385	10
	47	31				20				101	14
	70	17				39				182	24
	26	84				18				669	20
	23	82				20				237	18
	114	89				34				626	7
	64	86				24				418	9
	36	49				8				179	9
	40	63				17				209	9
209.00			18.00		2.40		4.70	104.00	0.40		
36.50			19.20		1.00		5.90	17.70	0.30		
29.60			4.00		0.60		2.30	15.10	-0.20		
46.90			-1.00		2.10		1.60	24.50	0.40		
32.00			2.50		1.10		2.50	16.90	0.40		
29.00			-1.00		1.30		1.30	12.20	0.30		
	56	17				22				500	13

				38	62					23							655		10
				61	67					21							1386		8
				58	54					21							1243		8
				44	25					19							522		16
				57						26							899		8
				50	105					17							763		6
				62	137					28							573		5
				62	124					19							1100		7
				71	121					20							2191		8
				66	120					23							2542		9
				56	121					20							1533		9
				68	117					21							1953		9
				66	118					21							1744		9
				60	112					20							1405		7
				69	122					20							1314		7
				65	124					20							1304		7
				57	118					20							1710		7
				48	86					21							466		11
				43	85					21							494		12
				38	87					18							535		13
				35	79					17							514		16
				27	78					19							508		15
				41	68					21							582		13
				26	74					15							394		14
				30	77					16							400		15
				27	78					17							312		15
				38	62					23							655		10
				61	67					21							1386		8
				58	54					21							1243		8
																			8
				54	74					20							925		13
				35	81					16							500		14
				61	7		99			23							1700		12
				50	78		1268			22							1775		10
				54	48		506			23							1384		14
				47	35		113			22							2132		10
				62	130		134			20							1441		6
				59	14		79			24							2102		12
				69	91		75			21							1346		6
				54	143		183			20							2110		3
				41	21		11			22							2249		12
1.84		7.35	17.00	65.90	89.10			1.35	10.20			2.01		0.44	6.35	0.39		3.22	
		5.02	42.70	59.60				2.15	13.50			4.81		0.34	15.70	0.61		2.85	
		6.89	20.10	74.50	87.10			1.62	10.10			2.40		0.39	7.42	0.49		3.56	
		8.06	13.00	56.90	130.00	2.35		1.27	10.40			1.69		0.41	4.42	0.31		1.54	
		5.55	40.80	42.50		1.22		2.32	12.10			5.40			16.10	0.66		2.98	
-1	1396		6	57	0		109	0.70		20	2.0	1.3	0.6		4	0.2			5
1	2596		144	25	8		9	2.60		25	13.3	1.3	3.1		44	1.2			28
2	2026		150	35	2		15	3.10		46	13.5	1.2	3.0		49	1.0			36
2	652		6	67	0		197	0.90		24	2.4	1.3	0.6		4	0.2			5
1	2847		204	27	6		6	3.40		14	18.0	1.7	3.9		62	1.3			36
17	806		19	78	96		74	0.70		19	2.8	1.9	0.7		10	0.3			7
21	979		19	91	179		38	0.90		23	3.8	2.1	0.9		9	0.4			8
-1	-500		18	83	149		87	1.00		21	3.3	2.0	0.8		9	0.3			7
-1	514		19	73	96		17	0.60		25	3.0	2.4	0.8		10	0.3			9
2	651		65	57	62		8	1.90		22	8.2	4.1	1.9		45	0.7			14

				121			20							8
				25			19							16
			65	804			12						1179	5
			140	1673			26						1402	4
				185	160									
				110	145									
				105	138									
				125	145									
				75	105									
				110	22									
				230	118									
				90	32									
				90	128									
				110	40									
				300	80									
				60	20									
				105	65									
				250	22									
				220	145									
				200	220									
				120	112									
				225	162									
				70	35									
				125	140									
				85	220									
				125	140									
				5	445									
				175	172									
				120	110									
				70	70									
				1100	128									
				160	90									
				135	80									
				260	177									
				335	180									
				245	175									
				235	190									
				175	177									
				265	197									
				65	360									
				140	410									
				30	330									
			62	90									1456	7
			58	79									1375	7
			44	342									888	7
			103	116			22							8
			123	149			23							9
			97	69			23							7
			97	93			25							11
			79	100			21							7
			105	31			24							10
			98	101			22							9
			84	131			22							7
			84	109			20							36
			88	76			23							9
21	907	21	50	114	17	1.1	17	3.5	1.4	0.8	9	0.24		7

	307	83	65	93	1	19	1.4	19	4.9	4.1	1.1	23	0.40	10
	215	62	51	121		22	1.3	19	4.9	2.1	1.1	19	0.33	12
	206	133	52	89		31	2.3	23	6.2	3.4	1.3	36	0.55	17
55	1518	19	61	93			0.7	18	2.5	2.6	0.1	8	0.21	7

Nd	Ni	Pb	Rb	S	Sb	Sc	Se	Sm	Sn	Sr	Ta	Tb	Ti	Th	U	V	W	Y	Yb	Zn	Zr
	5	4	54			13		8	8	136	2	1.29	4805	21	4	66	-2	34	3.58	58	174
	7	6	62			20		7	1	162	2	1.29	7668	15	2	136	-2	30	3.30	13	160
	6	8	54			15		7	6	157	2	1.30	6492	17	-2	108	-2	33	3.64	15	192
	4	4	29			17		7	bd	69	2	1.21	5305	19	-2	70	-2	35	3.96	19	229
	17	4	29			17		9	bd	70	3	1.35	8100	19	3	137	-2	39	4.08	37	223
	11	4	21			18		6	2	130	3	1.01	5201	13	-2	62	-2	26	2.80	26	207
	64	4	55			22		6	12	138	3	0.88	6168	15	-2	148	-2	26	2.73	26	180
	67	2	79			22		7	bd	143	3	1.10	6053	15	-2	176	-2	29	3.12	45	153
13	39		4	9		44				67						445		24		10	78
28	34		6	28		43				56						467		35		13	106
19	79		9	13		34				83						339		31		8	97
25	86		5	46		41				61						366		26		14	87
21	47		6	5		34				64						374		28		13	96
18	67		46	29		38				103						369		25		25	74
0	86		28	32		36				108						316		22		19	70
14	146		195	98		26				140						228		20		17	52
3	80		115	196		34				119						297		23		10	71
14	146		195	98		26				140						228		20		17	52
3	80		115	196		34				119						297		23		10	71
0	20		26	310		14				182						153		13		3	40
13	51		42	375		36				116						356		27		3	80
15	31		35	227		31				124						319		27		8	71
0	43		62	150		34				143						312		23		10	68
	67	28				39				26			10964			365		42		48	112
8.42	50	23	14			32		2.49		143		0.58	8872			488		23	2.17	50	50
	80	24				43				41			9075			317		46		58	83
	93	24				43				184			8064			355		30		63	83
	46	26	35			45				140			7868			371		31		57	86
11.7	90	25	29			37		3.27		174		0.7	8121			309		24	2.23	90	76
	64	27	29			46				74			9295			361		34		222	104
	53	31	12			49				106			11674			439		34		177	75
42.8	79	24	40			33		8.81		622		1.41	7003			206		40	3.68	58	101
	4					12				30			2617			7		95			318
40.4	7	1				19		11.5		18		2.2	3152			24		80	7.71		300
	26	2	9			29				38			4255			10		67			273
	64									58			7574			418		55		40	96
	56	25	159			47				253			10350			542		18		32	35
12.3	99	28	31			30		3.46		197		0.71	9550			317		25	2.35	121	72
	30	28	44			37				137			12115			332		42		24	132
	83	22	69			47				232			6346			308		21		20	59
	96	15	97			46				147			7879			401		22		15	54
	11	8	22			45				431			17454			161		80		40	230
	12	14	46			30				199			10817			74		67		84	264
	43	14	10			60				218			14800			495		70		1106	139
	78	48	7			52				169			15010			558		91		1941	328
	40	140	25			46				324			11362			414		57		1908	204
	22	43	61			34				614			5193			254		27		161	119
	9	26	21			29				614			7810			179		62		61	190
	72	87	29			32				80			4956			197		24		337	98
	37	19	101			42				191			8158			361		26		128	80
	91	35	19			43				124			6614			289		23		145	68
	31	15	18			43				325			12000			625		30		125	90

58	36	17	51	214	8728	394	30	152	88
66	19	30	46	141	7882	353	26	242	78
73	33	44	43	161	7794	332	28	124	89
91	20	17	52	122	8371	361	28	130	78
57	26	25	42	166	7344	335	26	143	70
	9	70		142			29		133
69	15	28	48	145	8027	382	22	333	87
68	14	42	46	259	9831	398	32	127	110
46	8	36	45	144	13251	418	42	140	161
42	7	165	49	44	11984	499	40	146	138
66	18	109		67	16626	414	46	199	147
83	7	165	44	44	7936	337	40	156	138
68	5	15		85	9094	413	33	135	102
72	14	39	45	99	9070	388	29	130	101
77	33	44		75	8633	363	29	279	91
81	27	45	46	114	8740	387	28	110	90
68	42	121		63	17135	431	47	221	146
92	35	107	45	44	13788	509	37	329	136
58	60	212	46	47	18763	454	39	752	157
84	22	64	50	90	9131	377	33	199	86
15	13	74	38	153	10762	228	44	160	145
11	8	80		79	11304	162	56	111	208
36	11	304	57	47	13012	457	36	157	164
32	10	19	41	132	14714	336	48	131	180
42	14	133	47	46	17382	531	51	169	185
33	48	186	43	29	19871	380	56	515	203
113	27	71	47	151	5603	285	20	253	58
90	10	47	48	124	8669	379	26	171	81
56	40	101	50	59	14782	590	40	344	155
95	41	97	47	96	6752	331	25	341	67
	5	9		164			26		87
78	14	23	47	161	7768	348	27	122	92
76	12	39	47	165	9066	397	27	128	87
60	12	85	45	183	12288	443	36	180	102
86	9	13	47	191	8361	371	27	127	77

23	7	2	5
25	8	2	6

11		4			0	3
	2	6	1	1	1	4
	0	4		1	1	2
	1	5	1	1	1	4
	1	6	2	1	1	4
	0	7	1	2	2	6
	0	2	2		1	2

74	144	24	44	183	7707	340	23	289	67
77	164	39	46	99	7760	346	21	448	66
81	134	229	46	59	7848	350	23	368	73
76	584	57	44	87	7302	344	20	248	71
78	388	46	44	97	6400	329	17	213	56
78	174	25	39	140	7950	328	21	254	65
55	61	37	41	132	9357	400	22	209	72
105	107	321	51	17	8700	443	30	428	63
74	92	44	46	81	6231	324	19	177	53
72	1580	50	43	69	7127	327	15	274	72
84	126	25	48	110	7084	332	21	484	70
95	65	35	47	92	6705	323	21	246	66
60	433	32	38	106	7933	337	23	282	81
54	184	22	43	153	8037	339	23	254	75
78	364	50	46	117	6913	326	21	268	71
55	456	54	37	101	6158	250	39	459	261
89	49	42	47	112	7063	328	22	205	72

70	143	30	48		82		5754			315	25		270	66
85	105	28	48		128		6901			329	21		216	70
77	282	30	47		120		6735			324	20		305	61
66	191	14	45		148		7125			329	21		253	64
68	78	20	44		127		7153			325	22		202	71
53	40	78	43		100		7594			353	21		177	67
47	45	138	39		118		9191			383	24		319	84
38	137	36	35		158		9570			373	24		216	85
36	287	125	38		101		10759			385	27		627	101
20	57	48	28		235		9733			369	30		163	121
14	83	32	35		175		11103			285	43		251	158
20	40	72	28		208		9820			356	29		159	97
82	82	19	47		122		7341			337	20		206	59
67	67	30	44		133		6500			292	27		226	114
44	44	133	36		133		8627			348	24		267	85
43	42	24	40		157		8166			347	24		311	83
76	122	37	46		125		7775			343	25		287	76
79	130	102	45		93		7083			344	21		346	70
77	82	64	43		86		6767			319	22		272	72
81	69	39	44		128		6452			313	20		270	71
55	74	48	36		147		7994			320	25		-215	84
27	41	28	36		179		9529			348	32		175	108
28	26	48	36		172		9546			362	32		162	121
20	93	25	30		213		9751			383	26		942	97
69	148	26	42		151		7482			330	23		234	77
83	5	17	45		119		9524			365	28		85	91
86	5	11	44		99		10542			391	29		14	97
86	5	29	52		102		9764			395	27		86	99
83	5	29	47		94		9584			370	23		44	98
74	6	23	47		135		9404			374	29		85	93
89	6	116	49		54		9884			386	25		44	99
71	5	9	49		83		8865			444	34		13	111
70	5	28	32		122		9105			409	29		56	93
65	5	28	31		111		9225			422	28		103	95
41	22	133	43		487		6421			264	17		85	57
74		21	46		171		9740			401	30		97	104
79	41	60	25		1124		2924			111	15		107	4
50	33	40	37		1103		4009			160	19		84	25
3	3	5	7		15		1592			19	12		0	136
10	7	17	3		14		1533			30	7		13	135
115	3	76	31		30		10938			317	34		6	126
58	4	27	14		16		7953			343	49		6	173
88	4	10	14		10		9165			270	27		3	248
24	4	201	12		34		3679			94	32		9	163
26	3	222	14		40		4675			93	22		8	215
120	1	53	49		120		7451			447	18		16	82
64	3	156	45		98		6146			344	35		10	77
28	2	49	23		185		5423			133	24		0	124
51	12	159	28		70		5130			271	26		0	78
				15.20		1.40		20.50	4.00			3.30		
				4.00		-1.00		17.90	4.60			1.90		
				2.70		-1.00		1.80	-2.00			1.50		
				5.60		1.20		1.10	-2.00			3.10		
				3.30		-1.00		4.20	-2.00			2.40		
				3.50		-1.00		0.90	-2.00			2.70		
88	3	70	34		162		12972			427	50		17	148

	52	4	119			42				195			9960			424		38		55	110
	68	4	119			41				182			9764			409		29		85	91
	61	3	139			47				212			12392			531		26		28	79
	28	2	53			31				110			14206			294		73		17	133
	113	2	172			49				100			12658			661		31		26	94
	66	1	116			50				204			6391			269		23		22	50
	119	1	361			47				98			9327			400		13		26	91
	93	2	88			42				185			6403			297		19		23	62
	79	7	47			45				89			8469			363		29		123	99
	81	170	91			44				100			8363			374		27		331	96
	72	11	49			40				138			7929			350		27		112	91
	77	14	47			43				119			8290			369		27		139	98
	83	4	18			46				172			7691			356		28		97	95
	88	3	7			42				110			7255			357		27		44	75
	123	3	32			44				111			7931			358		24		81	79
	105	2	71			48				74			8188			353		24		43	78
	89	2	17			41				81			7576			350		25		45	78
	59	5	45			43				166			9133			358		34		17	116
	60	5	69			38				160			9517			355		38		17	122
	31	4	95			36				150			10076			283		54		15	134
	32	6	77			36				150			10828			284		58		20	140
	23	4	92			38				161			10941			275		70		15	139
	56	4	135			37				149			10238			391		46		16	132
	20	5	76			38				161			10606			228		61		12	137
	30	4	103			35				151			10708			224		59		12	137
	19	6	25			41				164			10890			193		62		9	139
	52	4	119			42				195			9960			424		38		55	111
	68	4	119			41				182			9764			409		29		85	91
	61	3	139			47				212			12392			531		26		28	79
		4	122							151								28			76
	54	2	90			44				322			8382			249		69		30	102
	13	3	51			39				171			10632			237		66		13	95
	29	5	74			41				74			13837			351		40		52	141
	69	5	30			40				94			9524			378		39		38	119
	69	5	136			43				86			12160			503		57		51	134
	69	5	21			44				97			11022			447		38		78	114
	78	2	12			44				107			9386			385		29		37	93
	18					40				85			17014			343		51		112	170
	73		13			43				117			9604			373		34		47	93
	77	22	35			44				376			6881			392		23		178	62
	13	2				37				90			15225			285		53		123	199
					1.34	46.90		3.59				0.85		0.88			73.20		2.74	110	
					1.35	42.40		7.38				1.57		2.00			103.00		7.42	276	
					0.39	48.20		3.88				0.95		0.86			98.30		3.53		
			25.60		3.34	47.20		2.86				0.74					79.70		2.42	234	
			28.40		0.83	40.80		7.78				1.59		3.03			138.00		5.18	185	
7	113	17	12	1063	-0.2	50		2		135	-1.0	0		0.30	-2.0	789	51.0	17	1.4	55	50
66	17	5	4	-50	0.6	27		12		298	-1.0	2		12.8	13.5	182	129.0	75	7.6	7	52
65	31	8	4	-50	1.4	42		12		210	-1.0	2		10.4	13.3	449	124.0	91	7.2	14	58
6	122	3	36	1132	-0.2	50		2		141	-1.0	0		0.3	-2.0	799	51.0	18	1.7	56	50
88	22	6	42	-50	-0.2	45		16		210	-1.0	3		13.8	14.3	257	91.0	91	9.3	14	59
13	62	1	14	486	-0.2	36		3		175	1.8	1		2.7	-2.0	310	204.0	22	1.8	34	84
13	72	1	14	570	-0.2	38		4		191	1.9	1		2.0	-2.0	291	410.0	26	2.3	19	89
11	82	1	39	75	0.2	38		3		193	2.0	1		2.4	-2.0	277	345.0	23	1.9	29	76
11	68	1	32	-50	-0.2	49		3		92	-1.0	1		2.8	-2.0	378	192.0	26	2.2	31	101
43	47	1	333	-50	-0.2	35		8		302	1.9	1		4.3	-2.0	329	233.0	46	4.7	37	165

	79	7	47		45		89					363	29		123	99
	28	-3	53		31		110					294	73		17	133
	214	2	23		43		128			3097		230	12		40	26
	291	3	34		42		95			3363		237	12		48	33
	75	7	50		15		205					340	26		126	96
	120	3	42		15		292					330	25		190	68
	53	3	49		35		166					320	21		112	60
	58	18	85		25		139					405	27		100	87
	45	4	39		10		167					505	38		64	141
	48	2	36		20		137					505	38		46	126
	100	2	24		20		181					265	23		40	96
	53	6	47		20		125					475	33		44	116
	70	8	47		15		144					370	32		118	100
	65	7	17		25		177					360	37		82	88
	115	9	139		25		91					255	28		94	99
	70	7	17		20		175					550	81		59	152
	170	8	19		10		132					270	19		110	54
	68	2	8		30		219					380	31		60	86
	133	2	10		15		139					315	16		96	38
	93	4	47		15		115					305	16		135	39
	98	3	75		20		219					225	15		112	34
	100	2	31		20		176					340	19		124	53
	40	5	21		20		152					470	32		78	88
	65	2	6		20		76					350	25		96	90
	103	2	9		20		123					390	30		90	83
	65	2	6		20		76					350	25		96	90
	105	5	74		20		169					760	19		38	58
	110	2	34		15		170					355	26		48	78
	108	8	130		15		202					300	26		90	165
	50	2	46		5		141					450	50		160	194
	293	3	87		15		101					200	12		94	39
	73	4	41		20		133					470	47		165	158
	88	7	38		15		133					420	48		165	157
	103	4	75		30		216					325	21		105	69
	100	5	31		15		157					350	22		105	66
	88	8	65		15		180					295	21		112	70
	95	4	108		20		190					320	23		118	68
	110	7	109		15		225					380	26		98	116
	133	2	74				254					375	24		124	111
	70	22	68				207					395	44		250	240
	85	2	72		20		144					385	26		35	70
	95	6	30		25		141					770	25		86	75
	95		15		48		191			13085		588	23		96	78
	93	3	16		46		201			12431		526	23		94	80
	93	6	18		20		328			3254		77	12		104	41
	82	5	91		48		95					402	31		121	88
	89	1	26		45		136					419	31		17	109
	63	2	20		47		188					361	24		55	84
	104	2	24		44		163					402	35		40	121
	86	12	46		47		187					319	24		41	75
	66	2	22		51		106					437	38		44	109
	56	5	30		42		158					337	28		51	93
	77	2	18		48		151					330	24		62	65
	54	3	10		54		137					181	81		18	128
	56	7	74		45		146					362	32		35	95
12	45	1	10	882	36	12	137	0.7	0.6		2.0	308	21	1.7	8	64

36	20	50	6	22	32	36	49	1.9	0.8	6.0	106	28	2.6	9	177
32	78	4	38	8	46	32	70	1.3	0.8	4.2	235	28	2.4	31	87
59	47	17	15		28	59	97	1.3	1.1	8.7	108	36	3.5	10	135
10	41	1	9	851	17	10	171	1.7	0.4	3.4	105	16	1.5	8	101

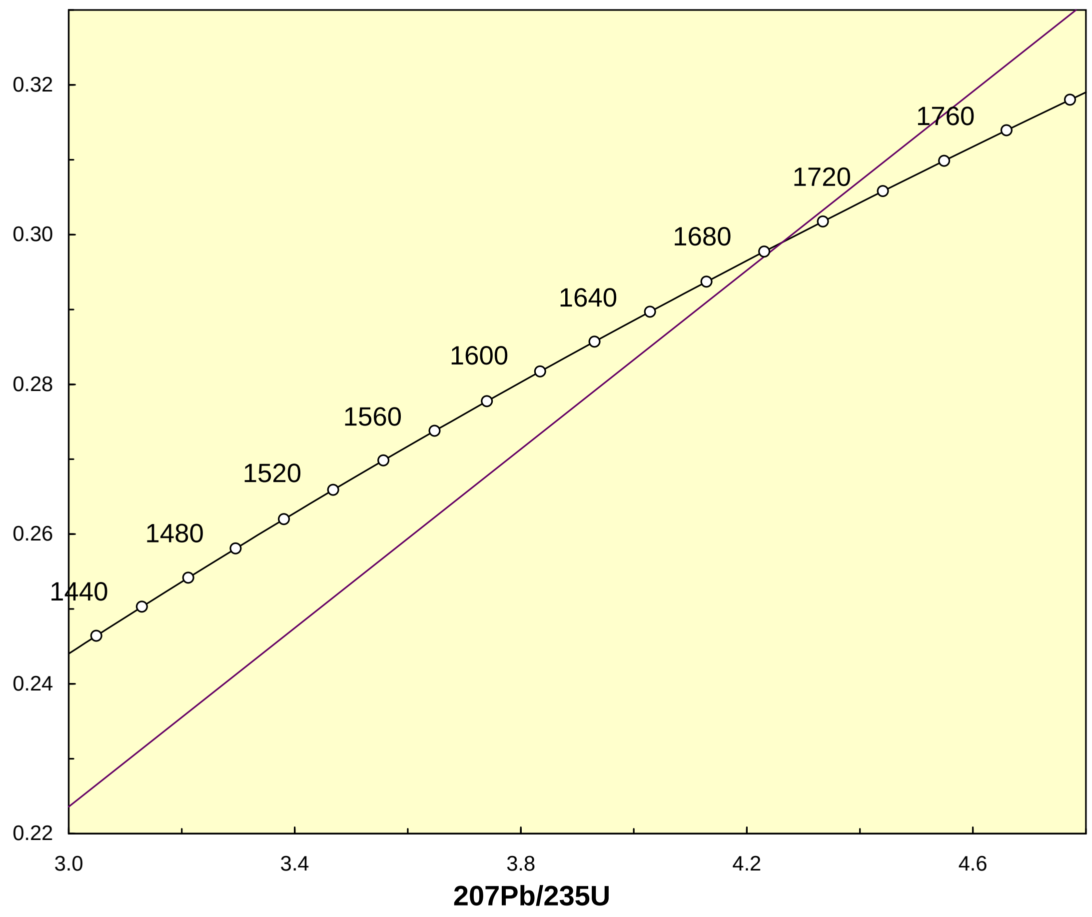
SHRIMP Upb Data for Snake Creek Tonalite (Rubenach)

Table *xyz* . Summary of SHRIMP U-Pb zircon results for sample S536.

Grain. spot	U (ppm)	Th (ppm)	Th/U	^{206}Pb* (ppm)	^{204}Pb/ ^{206}Pb	f_{206} %	Radiogenic Ratios ^{206}Pb/ ^{238}U	±	^{207}Pb/ ^{235}U	±	^{207}Pb/ ^{206}Pb	±	ρ	Age (Ma) ^{206}Pb/ ^{238}U	±	^{207}Pb/ ^{206}Pb	±	% Disc
1.1	209	122	0.58	53	0.000075	0.12	0.2948	0.0034	4.201	0.055	0.1034	0.0007	0.876	1665	17	1686	12	1
2.1	246	146	0.59	60	0.000094	0.15	0.2842	0.0032	4.001	0.051	0.1021	0.0006	0.869	1613	16	1662	12	3
3.1	275	165	0.60	70	0.000044	0.07	0.2946	0.0033	4.179	0.051	0.1029	0.0005	0.902	1664	16	1677	10	1
4.1	505	377	0.75	127	0.000044	0.07	0.2936	0.0031	4.175	0.047	0.1031	0.0004	0.937	1659	16	1681	7	1
5.1	281	177	0.63	71	0.000096	0.15	0.2933	0.0033	4.173	0.052	0.1032	0.0006	0.885	1658	16	1682	11	1
6.1	605	409	0.68	141	0.000086	0.14	0.2705	0.0028	3.809	0.043	0.1021	0.0004	0.925	1543	14	1663	8	7
7.1	240	151	0.63	51	0.000630	1.00	0.2427	0.0027	3.369	0.065	0.1007	0.0016	0.587	1401	14	1637	29	14
8.1	116	38	0.33	27	0.000092	0.14	0.2671	0.0033	3.813	0.060	0.1035	0.0010	0.785	1526	17	1688	18	10
9.1	385	244	0.63	97	0.000019	0.03	0.2944	0.0032	4.169	0.049	0.1027	0.0005	0.911	1663	16	1674	9	1
10.1	299	134	0.45	72	0.000229	0.36	0.2797	0.0031	3.916	0.053	0.1015	0.0008	0.814	1590	15	1652	15	4
11.1	427	305	0.71	107	0.000056	0.09	0.2905	0.0031	4.125	0.051	0.1030	0.0006	0.875	1644	16	1679	11	2
12.1	193	94	0.49	45	0.000217	0.34	0.2722	0.0031	3.809	0.056	0.1015	0.0009	0.787	1552	16	1651	17	6
13.1	166	85	0.51	42	-	<0.01	0.2910	0.0035	4.180	0.066	0.1042	0.0011	0.762	1646	18	1700	19	3
14.1	770	132	0.17	163	0.000137	0.22	0.2459	0.0026	3.341	0.038	0.0985	0.0005	0.912	1417	13	1597	9	11
15.1	333	181	0.54	80	0.000007	0.01	0.2808	0.0030	3.988	0.047	0.1030	0.0005	0.926	1595	15	1679	8	5
16.1	311	186	0.60	79	0.000043	0.07	0.2958	0.0032	4.186	0.050	0.1027	0.0005	0.916	1670	16	1673	9	0
17.1	415	291	0.70	105	0.000055	0.09	0.2958	0.0032	4.206	0.050	0.1031	0.0005	0.913	1670	16	1681	9	1
18.1	182	92	0.51	47	0.000082	0.13	0.3018	0.0035	4.309	0.056	0.1036	0.0006	0.890	1700	19	1689	11	-1
19.1	132	44	0.33	29	0.000502	0.79	0.2562	0.0031	3.618	0.070	0.1024	0.0015	0.627	1470	16	1669	28	12
20.1	322	197	0.61	82	0.000039	0.06	0.2973	0.0032	4.210	0.050	0.1027	0.0005	0.919	1678	16	1674	9	0

Notes :

1. Uncertainties given at the one σ level.
2. f_{206} % denotes the percentage of ^{206}Pb that is common Pb.
3. Correction for common Pb made using the measured ^{204}Pb/^{206}Pb ratio.
4. For % Disc., 0% denotes a concordant analysis.



0.32
0.30
0.28
0.26
0.24
0.22
3.0
3.4
3.8
4.2
4.6
207Pb/235U
1440
1480
1520
1560
1600
1640
1680
1720
1760

Geoscience Australia Ozchem Database - Mafic Rocks Mount Isa Eastern Succession

FEATURE	UFI	SITEID	SITENO	SAMPLEID	ANALYTYPE	COM_STA	SIO2	TIO2	AL2O3	FE2O3TOT	FE2O3	FEO	MNO	MGO	CAO	NA2O	K2O	P2O5	H2OPLUS	H2OMIN	CO2
RCHEM	66	94532128	87472	94532128	whole-rock	M	69.58	0.63	14.69	4.91	2.03	2.59	0.06	1.6	0.77	1.9	3.01	0.09	0	0	0
RCHEM	75	94531948	87447	94531948	whole-rock	M	64.29	0.49	14.75	5.69	3.49	1.98	0.04	2.06	1.15	0.58	4.45	0.07	0	0	0
RCHEM	100	94531732	87418	94531732	whole-rock	M	64.28	0.48	13.7	6.19	5.47	0.65	0.02	1.58	1.53	1.36	2.91	0.05	0	0	0
RCHEM	165	94531840	87433	94531840	whole-rock	M	50.13	1.48	13	15.79	9.5	5.66	0.17	4.71	2.06	3.38	0.23	0.11	0	0	0
RCHEM	199	94531654	87407	94531654	whole-rock	M	75.36	0.67	10.28	7.36	6.42	0.85	0.05	0.6	0.61	1.27	1.18	0.04	0	0	0
RCHEM	225	79205320A	73532	79205320A	whole-rock	M	70.56	0.41	13.35	3.46	1.94	1.37	0.01	1.29	1.67	3.69	4.01	0.1	0	0	0
RCHEM	589	DH105	7257	DH105	whole-rock	M	61.7	0.55	11.32	0	2.08	1.48	0.06	2.69	8.02	6.78	0.06	0.15	0	0	0
RCHEM	667	78530447	2921	78530447	whole-rock	M	74.2	0.2	13.1	0	0.77	0.75	0.01	0.31	0.98	3.34	5.25	0.08	0.29	0.23	0.1
RCHEM	1074	94532026	88473	94532026	whole-rock	M	68.6	0.59	13.69	6.66	5.28	1.24	0.05	1.01	0.88	0.24	3.96	0.24	0	0	0
RCHEM	1101	94532123	88475	94532123	whole-rock	M	75.01	0.44	12.59	3.25	1.54	1.54	0.07	1.08	1.29	2.39	2.02	0.08	0	0	0
RCHEM	1128	94531792	87426	94531792	whole-rock	M	64.77	0.61	17.73	4.11	2.99	1.01	0.01	1.24	0.32	1.38	5.41	0.11	0	0	0
RCHEM	1158	94531630	87403	94531630	whole-rock	M	57.88	0.45	12.67	6.01	3.35	2.39	0.09	3.12	5.14	0.35	3.61	0.11	0	0	0
RCHEM	1183	94531960	87449	94531960	whole-rock	M	49.65	2.1	12.51	14.08	2.96	10.01	0.15	5.81	5.35	1.94	0.11	0.25	0	0	0
RCHEM	1238	94531930	88471	94531930	whole-rock	M	67.29	0.58	16.42	3.92	3.48	0.4	0.01	1.32	0.25	0.34	5.08	0.09	0	0	0
RCHEM	1266	94532181	87480	94532181	whole-rock	M	73.56	0.49	12.35	5.13	2.37	2.48	0.04	1.33	0.76	1.73	2.22	0.08	0	0	0
RCHEM	1653	93206922	51318	93206922	whole-rock	M	75.9	0.03	14	0.72	0.53	0.17	0	0.04	0.51	6.95	0.74	0.18	0	0	0
RCHEM	2411	88206015	18860	88206015	whole-rock	M	63.41	0.28	17.67	1.96	1.82	0.13	0.01	0.43	0.12	1.79	13.07	0.08	0	0	0
RCHEM	2413	88206017	42217	88206017	whole-rock	M	70.56	0.28	14.89	1.48	1.3	0.16	0.01	0.41	0.16	3.67	7.34	0.08	0	0	0
RCHEM	2419	88206020	18862	88206020	whole-rock	M	72.82	0.34	13.77	2.1	1.32	0.7	0.03	0.45	1.05	6.38	2.35	0.08	0	0	0
RCHEM	3238	86206088	7088	86206088	whole-rock	M	66.04	0.61	14.96	0	2.7	2.19	0.03	0.9	2.16	4.16	4.6	0.15	0	0	0
RCHEM	3255	86206063	7069	86206063	whole-rock	M	79.6	0.66	8.96	0	1.76	0.15	-0.01	-0.01	0.17	0.07	7.65	0.13	0	0	0
RCHEM	3316	86206069	7074	86206069	whole-rock	M	72.06	0.19	13.75	0	1.3	1.08	0.01	0.27	1.65	3.55	4.45	0.04	0	0	0
RCHEM	3370	86206014	7027	86206014	whole-rock	M	49.59	1.53	13.81	0	1.69	10.78	0.2	6.56	12.14	1.55	0.18	0.12	0	0	0
RCHEM	3382	86206012	7025	86206012	whole-rock	M	72.38	0.27	8.25	0	2.58	0.3	0.11	0.7	4.92	4.69	0.13	0.1	0	0	0
RCHEM	3390	86206050	7059	86206050	whole-rock	M	72.82	0.2	13.62	0	1.05	0.67	0.01	0.38	1.16	3.42	5.47	0.04	0	0	0
RCHEM	3402	86206118	7114	86206118	whole-rock	M	67.02	0.5	14.36	0	2.41	2.24	0.04	1.49	2.81	3.47	3.3	0.13	0	0	0
RCHEM	3823	84536106	3219	84536106	whole-rock	M	69.81	0.42	14.6	0	0.96	2.23	0.03	0.67	1.59	3.63	4.67	0.23	0.47	0.14	0.06
RCHEM	3885	78531371	39126	78531371	whole-rock	M	67.3	0.58	14.7	0	1.94	2.05	0.04	0.86	2.62	3.93	4.52	0.15	0.82	0.21	0.05
RCHEM	3895	78530012	3254	78530012	whole-rock	M	48.2	0.81	13.9	0	1.39	8.73	0.18	9.53	13.5	1.58	0.23	0.05	1.46	0.15	0.16
RCHEM	3903	78531714	41765	78531714	whole-rock	M	71.3	0.33	13.4	0	1.67	1.23	0.02	0.67	1.28	3.26	4.78	0.09	0.74	0.22	0.48
RCHEM	3939	78534374	2934	78534374	whole-rock	M	69.4	0.34	15.1	0	0.06	1.6	0.01	0.94	2.44	6.9	0.86	0.11	0.81	0.14	1.05
RCHEM	3945	84536115	3226	84536115	whole-rock	M	72.98	0.27	13.58	0	1.54	0.58	0.01	0.72	1.66	5.37	0.84	0.08	0.69	0.39	0.56
RCHEM	3961	69200025	3099	69200025	whole-rock	M	63.7	0.46	12.65	0	0.47	0	-0.01	0.53	0.39	3.51	4.1	0.13	6.89	0	-0.05
RCHEM	3982	78531669	39141	78531669	whole-rock	M	72.7	0.21	13.6	0	1.84	0.84	0.04	0.44	1.05	7.06	0.83	0.18	0.53	0.12	0.1
RCHEM	3990	78530494	2922	78530494	whole-rock	M	78.3	0.17	10.2	0	0.82	0.53	0.02	0.19	1.44	5.66	0.28	0.04	0.07	0.14	1.25
RCHEM	4000	78530626	39140	78530626	whole-rock	M	71.2	0.44	13.6	0	0.45	2.37	0.02	0.76	1.83	3.34	4.5	0.13	0.69	0.14	0.3
RCHEM	4129	94531606	87399	94531606	whole-rock	M	66.73	1.37	12.76	5.86	2.48	3.04	0.11	1.04	1.71	0.21	0.95	0.07	0	0	0
RCHEM	4153	94532038	87460	94532038	whole-rock	M	58.19	0.83	19.85	7.96	3.69	3.84	0.08	2.08	0.4	0.31	5.04	0.19	0	0	0
RCHEM	4186	94532020	87458	94532020	whole-rock	M	66.09	0.7	16.08	6.17	3.8	2.13	0.02	1.32	0.37	1.16	3.91	0.22	0	0	0
RCHEM	4206	94531636	87405	94531636	whole-rock	M	75.64	0.58	11.58	3.21	1.71	1.35	0.03	0.97	0.72	1.71	2.49	0.03	0	0	0
RCHEM	4285	93206915	51313	93206915	whole-rock	M	72.53	0.22	13.59	2.32	2.12	0.18	0.02	0.36	0.84	3.68	5.1	0.06	0	0	0
RCHEM	4577	88206018	18861	88206018	whole-rock	M	72.55	0.28	13.68	1.02	0.65	0.33	0.01	0.4	1.44	5.98	3.11	0.07	0	0	0
RCHEM	4619	78534365	2356	78534365	whole-rock	M	49.3	1.43	13.9	0	0.34	11.2	0.24	6.5	11.2	2.66	0.73	0.15	1.41	0.31	-0.05
RCHEM	4711	78531187	2926	78531187	whole-rock	M	70.6	0.32	14.1	0	1.38	1.31	0.04	0.89	2.17	5.42	2.54	0.09	0.68	0.21	0.25
RCHEM	5181	94531828	87432	94531828	whole-rock	M	49.34	1.22	13.32	14.22	6.75	6.72	0.15	5.71	5.78	0.96	1.02	0.1	0	0	0
RCHEM	5211	94532098	87469	94532098	whole-rock	M	65.96	0.63	15.91	7.17	2.65	4.07	0.05	1.64	0.28	1.11	3.84	0.13	0	0	0
RCHEM	5212	94532068	87464	94532068	whole-rock	M	76.91	0.42	9.8	4.98	3.04	1.75	0.03	1.28	0.44	1.56	1.92	0.09	0	0	0
RCHEM	5213	94531648	88465	94531648	whole-rock	M	78.1	0.4	10.58	2.54	1.4	1.03	0.01	0.85	0.75	2.19	0.87	0.02	0	0	0
RCHEM	5283	94531989	87453	94531989	whole-rock	M	78.38	0.42	9.78	2.65	2.06	0.53	0	0.69	0.66	1.57	3.36	0.11	0	0	0
RCHEM	5302	94532146	87475	94532146	whole-rock	M	64.3	0.63	15.52	6.73	2.31	3.98	0.06	2.33	1.23	1.29	3.78	0.14	0	0	0
RCHEM	5337	94532050	87462	94532050	whole-rock	M	73.34	0.39	10.75	5.29	1.71	3.22	0.16	1.69	2.43	1.23	1.9	0.1	0	0	0
RCHEM	5338	94531936	87445	94531936	whole-rock	M	76.59	0.25	10.88	2.3	1.28	0.92	0.03	0.69	1.41	4.77	0.7	0.04	0	0	0

RCHEM	5798	92208004	42746	92208004	whole-rock M	66.28	0.74	12.36	7.24	1.55	5.12	0.23	0.44	2.82	0.78	8.11	0.21	0	0	0
RCHEM	5958	92208013	30793	92208013	whole-rock M	77.94	0.3	11.6	0.89	0.16	0.66	0	0.31	0.38	3.54	4.28	0.05	0	0	0
RCHEM	5959	92208026	30798	92208026	whole-rock M	66.35	0.71	15.11	2.11	2.11	0	0.03	0.07	0.07	0.38	11.7	0.07	0	0	0
RCHEM	7149	86206138	7130	86206138	whole-rock M	70.63	0.41	14.48	0	0.97	2.68	0.11	1.1	1.21	2.27	3.73	0.12	0	0	0
RCHEM	7180	86206129	7123	86206129	whole-rock M	70.52	0.41	13.86	0	1.14	0.98	0.01	0.65	2.3	4.64	3.34	0.12	0	0	0
RCHEM	7204	86206128	7122	86206128	whole-rock M	74.19	0.36	13.97	0	0.34	0.26	-0.01	0.11	1.32	5.92	2.05	0.02	0	0	0
RCHEM	7236	86206087	7087	86206087	whole-rock M	51.39	1.32	14.4	0	3.48	7.54	0.13	5.38	6.73	3.82	2.12	0.54	0	0	0
RCHEM	7348	86206057	7064	86206057	whole-rock M	63.76	0.5	14.11	0	0.98	2.71	0.11	2.86	8.17	5.13	0.68	0.14	0	0	0
RCHEM	7352	85206008	47378	85206008	whole-rock M	68.94	0.59	14.13	0	2.41	1.48	0.01	0.87	1.99	3.91	4.2	0.12	0	0	0
RCHEM	7366	86206002	7017	86206002	whole-rock M	47.46	1.01	16.35	0	2.64	8.3	0.17	6.4	11.26	2.67	0.41	0.08	0	0	0
RCHEM	7367	86206016	7028	86206016	whole-rock M	78.33	0.33	9.84	0	0.88	1.16	0.03	0.26	0.84	2.34	4.6	0.38	0	0	0
RCHEM	7389	86206119	7115	86206119	whole-rock M	71.92	0.13	15.31	0	0.51	0.49	-0.01	0.23	1.56	6	2.24	0.04	0	0	0
RCHEM	7429	86206059	7066	86206059	whole-rock M	72.37	0.17	13.63	0	1.19	0.64	0.01	0.31	1.33	3.4	5.63	0.05	0	0	0
RCHEM	7696	69200052	3313	69200052	whole-rock M	48.56	2.94	12.32	0	6.51	10.6	0.22	4.95	7.95	3.36	0.68	0.16	0.55	0	0.55
RCHEM	7701	69200278	3104	69200278	whole-rock M	58.24	0.61	20.25	0	7.3	0	0.06	1.89	0.18	1.13	4.8	0.16	4.72	0	-0.05
RCHEM	7746	84536107	39193	84536107	whole-rock M	73.51	0.22	13.37	0	1.22	0.55	0.01	0.34	1.04	4.16	4.35	0.07	0.36	0.24	0.12
RCHEM	7750	69200028	39218	69200028	whole-rock M	48.16	1.38	13.76	0	2.67	11.7	0.23	6.77	11.58	1.99	0.26	0.14	0.46	0	-0.05
RCHEM	7764	69200043E	3319	69200043E	whole-rock M	49.2	1.92	17.78	0	3.4	10.9	0.3	3.88	9.13	3.59	0.47	0.1	0.35	0	0.05
RCHEM	7783	78530065F	3255	78530065F	whole-rock M	49.2	2.23	12.1	0	6.01	9.02	0.15	4.96	8.78	3.89	0.81	0.19	1.52	0.22	0.05
RCHEM	7835	69200098	41812	69200098	whole-rock M	49.3	2.1	14.17	0	4.48	11.6	0.15	6.14	8.94	2.08	1.26	0.1	0.97	0	-0.05
RCHEM	7879	78531105	2573	78531105	whole-rock M	67.8	0.67	12.1	0	1.65	4.08	0.26	0.53	2.82	0.77	7.72	0.17	0.43	0.19	0.13
RCHEM	7933	78530361	39139	78530361	whole-rock M	68	0.4	15.1	0	1.3	1.66	0.04	0.85	2.11	4.93	4.26	0.16	0.58	0.2	0.15
RCHEM	8011	94532032	87459	94532032	whole-rock M	71.93	0.57	13.45	4.75	3.34	1.27	0.04	1.26	0.49	0.99	3.43	0.13	0	0	0
RCHEM	8123	94532074	87465	94532074	whole-rock M	67.12	0.64	14.97	6.62	3.62	2.7	0.07	1.69	0.53	1.06	3.7	0.15	0	0	0
RCHEM	8124	94531925	87444	94531925	whole-rock M	68.9	0.55	15.39	3.68	3.19	0.44	0.02	1.61	0.38	1.59	4.27	0.05	0	0	0
RCHEM	8147	94531678	87410	94531678	whole-rock M	48.78	1.27	13.55	18.02	16.61	1.27	0.15	2.17	2.14	1.75	1.06	0.09	0	0	0
RCHEM	8224	94531821	87431	94531821	whole-rock M	69.74	0.52	15.75	2.8	2.42	0.34	0.04	0.8	0.42	2.71	4.07	0.04	0	0	0
RCHEM	8256	93206918	51316	93206918	whole-rock M	76.06	0.14	12.87	0.48	0.28	0.18	0.01	0.1	0.17	3.29	5.71	0.01	0	0	0
RCHEM	8510	GC5	39398	GC5	whole-rock M	49.84	1.73	13.1	0	3.68	11.99	0.17	5.11	8.33	2.78	0.55	0.17	0	0	0
RCHEM	8519	78534405	2839	78534405	whole-rock M	59.3	1.01	14.7	0	4.62	3.9	0.1	2.3	4.74	4.26	2.67	0.39	1.1	0.28	0.25
RCHEM	8942	94532008	87456	94532008	whole-rock M	67.67	0.73	14.7	6.38	4.17	1.99	0.02	1.37	0.44	1.11	3.94	0.2	0	0	0
RCHEM	9002	94531642	87406	94531642	whole-rock M	55.2	1.48	12.18	12.78	3.48	8.37	0.19	4.45	6.38	1.91	0.75	0.08	0	0	0
RCHEM	9056	94532044	87461	94532044	whole-rock M	70.41	0.6	12.66	5.68	3.75	1.74	0.11	1.54	0.94	1.98	2.38	0.12	0	0	0
RCHEM	9057	94531980	87451	94531980	whole-rock M	62.12	0.68	18.77	5.68	2.62	2.75	0.03	1.63	0.69	1.07	5.25	0.13	0	0	0
RCHEM	9058	94531798	87427	94531798	whole-rock M	75.36	0.42	11.69	3.84	3.34	0.45	0.02	0.52	0.33	3.01	2.48	0.03	0	0	0
RCHEM	9082	94531864	87436	94531864	whole-rock M	72.65	0.76	12.66	4.46	3.46	0.9	0.05	0.75	0.44	1.37	3.61	0.07	0	0	0
RCHEM	9083	94531744	88467	94531744	whole-rock M	49.24	1	12.87	13.58	12.1	1.33	0.1	3.53	3.73	2.84	0.74	0.08	0	0	0
RCHEM	9115	94532151	88476	94532151	whole-rock M	68.38	0.58	13.6	5.99	1.5	4.04	0.04	2.3	1.13	1.52	3.2	0.13	0	0	0
RCHEM	9405	93206913	51311	93206913	whole-rock M	70.24	0.3	13.41	4.02	2.65	1.23	0.02	0.56	2.54	6.28	0.65	0.15	0	0	0
RCHEM	9633	92208027	30799	92208027	whole-rock M	45.73	0.17	4.6	38.75	38.75	0	1.79	0.07	0.53	0.29	2.48	0.79	0	0	0
RCHEM	11080	86206132	7126	86206132	whole-rock M	72.69	0.4	13.42	0	0.95	0.54	-0.01	0.69	2.06	6.98	0.51	0.12	0	0	0
RCHEM	11095	86206123	7118	86206123	whole-rock M	71.27	0.15	15.57	0	1.15	0.66	-0.01	0.34	1.83	7.07	0.56	0.06	0	0	0
RCHEM	11129	86206070	7075	86206070	whole-rock M	71.76	0.3	13.73	0	1.54	1.15	0.02	0.43	1.7	3.59	4.81	0.1	0	0	0
RCHEM	11162	86206022	39343	86206022	whole-rock M	71.79	0.32	13.59	0	1.49	1.39	0.02	0.57	1.44	3.47	4.63	0.11	0	0	0
RCHEM	11189	86206067	7072	86206067	whole-rock M	65.3	0.31	15.88	0	1.75	1.12	0.03	0.78	2.54	5.63	5.11	0.16	0	0	0
RCHEM	11215	86206011	7024	86206011	whole-rock M	46.79	1.64	11.66	0	1.89	12.13	0.19	4.93	7.37	2.04	0.33	0.14	0	0	0
RCHEM	11233	86206110	41884	86206110	whole-rock M	50.3	1.62	12.66	0	4.59	10.69	0.64	5.38	8.15	3.28	0.7	0.15	0	0	0
RCHEM	11265	86206005	7019	86206005	whole-rock M	97.45	0.02	0.79	0	0.01	0.11	-0.01	-0.01	-0.01	0.16	0.1	0.01	0	0	0
RCHEM	11281	86206082	7085	86206082	whole-rock M	69.36	0.43	14.26	0	1.89	1.12	0.01	0.66	1.68	4.92	3.85	0.11	0	0	0
RCHEM	11287	GC6	41902	GC6	whole-rock M	48.24	1.66	13.2	0	5.18	9.87	0.25	6.22	9.09	2.31	0.5	0.15	0	0	0
RCHEM	11681	84536113	3224	84536113	whole-rock M	70.74	0.4	13.92	0	1.93	0.73	0.05	0.86	1.93	5.77	1.82	0.11	0.71	0.24	1.14
RCHEM	11697	78530455	2940	78530455	whole-rock M	72	0.35	7.5	0	1.34	4.14	0.41	1.04	9.05	0.86	0.74	0.09	0.74	0.38	0.95
RCHEM	11700	78534226A	2933	78534226A	whole-rock M	74.5	0.17	13.3	0	1.02	0.47	0.03	0.24	0.85	3.67	4.49	0.06	0.52	0.15	-0.05
RCHEM	11711	78534266	39058	78534266	whole-rock M	48.8	1.62	13.7	0	5.26	10	0.21	5.4	8.25	3.77	0.61	0.17	1.26	0.35	-0.05
RCHEM	11740	74205701	3383	74205701	whole-rock M	49.27	3.36	13.05	0	5.06	9.5	0.19	4.21	6.47	2.65	1.87	0.34	2.56	0.16	0.1
RCHEM	11753	78531123	2355	78531123	whole-rock M	46.6	4.85	15.6	0	2.72	11.6	0.2	2.82	8.6	3.6	0.92	0.49	1.13	0.39	-0.05

RCHEM	11792	69200030	3307	69200030	whole-rock	M	47.82	1	17.89	0	1.74	8.45	0.15	6.2	12.65	2	1	0.11	1.04	0	-0.05
RCHEM	11847	69200039	3318	69200039	whole-rock	M	52.1	2.06	13.45	0	2.15	12.2	0.21	5.29	7	4.09	0.23	0.13	0.17	0	0.05
RCHEM	11894	78534226	47377	78534226	whole-rock	M	75.7	0.14	12.4	0	0.68	0.9	0.03	0.19	0.79	3.64	4.59	0.04	0.45	0.22	0.05
RCHEM	12002	94531846	87434	94531846	whole-rock	M	72.34	0.63	12.99	4.08	2.7	1.24	0.06	0.89	0.86	5.33	0.82	0.04	0	0	0
RCHEM	12079	94531714	87415	94531714	whole-rock	M	45.72	0.77	12.91	11.27	2.44	7.95	0.14	7.15	14.02	1.57	0.35	0.04	0	0	0
RCHEM	12080	94531768	87423	94531768	whole-rock	M	48.26	1.27	14.13	14.12	4.27	8.86	0.19	5.9	7.88	1.53	0.83	0.09	0	0	0
RCHEM	12280	94532055	88474	94532055	whole-rock	M	61.47	0.66	18.03	7.89	2.53	4.82	0.24	2.26	0.39	0.66	4.52	0.13	0	0	0
RCHEM	12281	94532002	87455	94532002	whole-rock	M	62.39	1.01	20.15	3.39	2.7	0.62	0.03	0.96	0.35	1.9	6	0.23	0	0	0
RCHEM	12484	86206065	7070	86206065	whole-rock	M	63.24	0.85	15.14	0	3.28	1.96	0.02	1.15	2.76	4.58	4.54	0.24	0	0	0
RCHEM	12497	78534205	2835	78534205	whole-rock	M	73.4	0.12	13.3	0	0.72	1.26	0.02	0.29	0.6	3.45	4.79	0.16	1.07	0.13	-0.05
RCHEM	12888	94532103	87470	94532103	whole-rock	M	74.96	0.45	12.82	3.25	1.21	1.84	0.06	1.14	0.42	2.44	2.6	0.08	0	0	0
RCHEM	12889	94532062	87463	94532062	whole-rock	M	63.12	0.6	16.76	6.89	3.4	3.14	0.07	2.32	0.78	0.86	4.07	0.14	0	0	0
RCHEM	12890	94531774	88468	94531774	whole-rock	M	69.6	0.54	12.41	5.77	4.99	0.7	0.06	1.2	1.13	3.18	1.72	0.04	0	0	0
RCHEM	12908	94532163	87477	94532163	whole-rock	M	66.44	0.77	15.97	6.08	2.66	3.08	0.04	1.86	0.32	1.45	3.69	0.1	0	0	0
RCHEM	12909	94532187	87481	94532187	whole-rock	M	51.4	1.64	12.75	17.92	9.49	7.59	0.11	4.29	2.6	3.02	2.71	0.15	0	0	0
RCHEM	12942	94532200	87483	94532200	whole-rock	M	76.67	0.41	10.77	4.49	2.39	1.89	0.02	1.05	0.2	2.95	1.49	0.08	0	0	0
RCHEM	12986	94531762	87422	94531762	whole-rock	M	42.54	1.15	15.83	14.55	12.17	2.14	0.19	6.02	1.82	0.52	2.29	0.08	0	0	0
RCHEM	13044	94531816	87430	94531816	whole-rock	M	50.58	1.35	12.29	15.14	8.14	6.3	0.15	4.59	4.26	2.16	1.24	0.12	0	0	0
RCHEM	13045	94531631	87404	94531631	whole-rock	M	66.52	0.65	13.19	4.96	3.67	1.16	0.06	1.54	2.26	0.83	3.73	0.09	0	0	0
RCHEM	13139	94531894	87440	94531894	whole-rock	M	70.63	0.47	14.76	3.12	2.65	0.42	0.02	0.65	0.28	3.9	3.46	0.06	0	0	0
RCHEM	13140	94531672	87409	94531672	whole-rock	M	55.41	1.4	11.48	14.6	7.41	6.47	0.17	3.95	5.41	2.22	0.7	0.1	0	0	0
RCHEM	13166	94531971	87450	94531971	whole-rock	M	70.16	0.56	15.68	3.03	1.85	1.06	0.01	1	0.55	2.98	3.18	0.1	0	0	0
RCHEM	13189	94531917	87443	94531917	whole-rock	M	54.24	1.23	13.15	12.5	3.44	8.15	0.13	5.02	6.74	2.87	1.14	0.09	0	0	0
RCHEM	13500	93206917	51315	93206917	whole-rock	M	60.12	0.88	16.63	6.66	2.93	3.36	0.07	1.94	4.07	4.46	2.96	0.24	0	0	0
RCHEM	13709	92208015	30795	92208015	whole-rock	M	76.82	0.33	13.33	0.11	0.11	0	0	0.01	0.44	5.11	3.45	0.06	0	0	0
RCHEM	13842	92208006	30805	92208006	whole-rock	M	87.93	0.17	5.46	2.48	0.65	1.65	0.03	0.43	0.15	1.79	0.99	0.06	0	0	0
RCHEM	15136	86206114	7110	86206114	whole-rock	M	80.18	0.32	8.8	0	0.94	2.03	0.06	0.36	0.57	1.48	3.84	0.1	0	0	0
RCHEM	15180	86206122	39352	86206122	whole-rock	M	65.79	0.69	15.81	0	3.47	1.92	0.04	0.83	2.88	7.32	0.38	0.23	0	0	0
RCHEM	15202	86206013	7026	86206013	whole-rock	M	80.53	0.29	9.05	0	0.95	0.82	0.02	0.34	1.04	4.62	0.41	0.18	0	0	0
RCHEM	15210	86206010	39341	86206010	whole-rock	M	75.08	0.57	14.17	0	0.91	0.12	-0.01	0.57	0.11	0.13	4.62	0.04	0	0	0
RCHEM	15211	86206015	39342	86206015	whole-rock	M	48.39	0.7	14.69	0	1.84	8.01	0.16	8.66	13.98	1.53	0.18	0.03	0	0	0
RCHEM	15212	86206062	47566	86206062	whole-rock	M	64.92	0.88	15.46	0	3.35	1.53	0.01	1.12	2.07	7.06	1.95	0.24	0	0	0
RCHEM	15215	86206112	39351	86206112	whole-rock	M	60.96	1.21	17.45	0	2.23	3.04	0.37	0.25	8.16	3.3	2.41	0.24	0	0	0
RCHEM	15235	86206109	7107	86206109	whole-rock	M	48.21	0.81	12.55	0	2.07	9.54	0.2	9.76	13.07	1.55	0.43	0.06	0	0	0
RCHEM	15258	86206025	7035	86206025	whole-rock	M	54.73	1.87	12.13	0	3.25	11.18	0.29	2.38	7.67	3.75	0.48	0.37	0	0	0
RCHEM	15259	86206125	7120	86206125	whole-rock	M	62.64	0.82	15.82	0	2.35	2.67	0.05	1.33	3.64	4.5	3.6	0.21	0	0	0
RCHEM	15260	86206127	7121	86206127	whole-rock	M	73.47	0.37	13.62	0	0.63	0.7	0.01	0.55	1.95	5.52	1.95	0.09	0	0	0
RCHEM	15302	86206116	7112	86206116	whole-rock	M	73.86	0.12	14.05	0	0.19	0.44	-0.01	0.23	1.21	3.54	4.69	0.02	0	0	0
RCHEM	15309	86206117	7113	86206117	whole-rock	M	68.5	0.52	14.52	0	1.99	2.62	0.04	1.32	2.78	3.4	2.7	0.12	0	0	0
RCHEM	15773	84536117	3228	84536117	whole-rock	M	71.77	0.29	13.65	0	1.17	1.34	0.03	0.52	1.2	3.38	5.31	0.07	0.66	0.3	0.13
RCHEM	15782	78534061	41788	78534061	whole-rock	M	58.6	1.26	14.9	0	6.91	0.76	0.07	2.49	4.75	5.45	2.93	0.42	0.72	0.19	-0.05
RCHEM	15793	78530037E	2571	78530037E	whole-rock	M	66.3	1.11	11.2	0	3.18	4.21	0.07	0.59	11.4	0.45	0.14	0.24	0.52	0.18	0.17
RCHEM	15807	78530599	41781	78530599	whole-rock	M	71.5	0.39	13.2	0	1.34	1.75	0.03	0.66	1.4	3.31	4.81	0.1	0.7	0.17	0.1
RCHEM	15819	78530699	2925	78530699	whole-rock	M	72.6	0.33	13.2	0	1.41	1.14	0.01	0.76	1.5	3.28	4.49	0.1	0.62	0.25	0.05
RCHEM	15851	69200047	3321	69200047	whole-rock	M	45.47	1.93	10.03	0	6.48	13.3	0.35	8.06	10.9	1	0.67	0.18	0.53	-0.05	0
RCHEM	15862	78530263	2920	78530263	whole-rock	M	73.3	0.29	13.7	0	0.66	1.23	0.03	0.51	1.64	3.24	4.53	0.08	0.48	0.29	0.05
RCHEM	15894	78534070	2942	78534070	whole-rock	M	48.9	3.9	12.6	0	1.48	11.7	0.34	3.66	9.4	2.14	3.85	0.46	0.64	0.3	-0.05
RCHEM	15974	94532193	87482	94532193	whole-rock	M	77.06	0.44	11.01	4.17	1.58	2.33	0.04	1.08	0.58	1.88	1.98	0.08	0	0	0
RCHEM	16082	94531858	88470	94531858	whole-rock	M	65.81	0.65	14.14	4.5	3.22	1.15	0.04	1.32	2.49	1.31	4.22	0.05	0	0	0
RCHEM	16100	94531964	88472	94531964	whole-rock	M	50.06	1.38	9.04	12.77	7.86	4.42	0.19	2.6	9.87	1.86	0.47	0.15	0	0	0
RCHEM	16120	94531900	87441	94531900	whole-rock	M	71.24	0.36	14.59	3.27	2.25	0.92	0.01	0.84	0.22	2.79	4.08	0.04	0	0	0
RCHEM	16564	78530516	2832	78530516	whole-rock	M	62.6	0.74	16.2	0	4.75	3.55	0.12	1.04	4.85	3.13	1.38	0.23	1.33	0.19	-0.05
RCHEM	16891	94532079	87466	94532079	whole-rock	M	60.68	0.74	19.45	6.64	2.24	3.96	0.12	1.93	0.34	0.9	5.71	0.15	0	0	0
RCHEM	16916	94532116	87471	94532116	whole-rock	M	62.32	0.75	19	5.56	3.59	1.77	0.06	1.86	0.26	0.62	4.77	0.1	0	0	0
RCHEM	16917	94532133	87473	94532133	whole-rock	M	69.82	0.58	14.54	4.65	2.48	1.95	0.02	1.8	0.27	1.77	3.11	0.08	0	0	0
RCHEM	16918	94531953	87448	94531953	whole-rock	M	43.52	1.5	12.66	15.1	4.24	9.77	0.19	5.18	7.88	2.03	0.15	0.12	0	0	0

RCHEM	16962	94531780	87424	94531780	whole-rock M	65.79	0.4	11.98	6.07	4.13	1.75	0.06	3.1	0.75	0.98	4.7	0.08	0	0	0
RCHEM	16963	94531612	87400	94531612	whole-rock M	77.03	1.03	10.57	3.56	1.98	1.42	0.05	0.66	0.17	0.17	1.81	0.03	0	0	0
RCHEM	16976	94532167	87478	94532167	whole-rock M	88.47	0.16	4.71	2.62	1.16	1.31	0.01	0.63	0.32	1.27	0.58	0.05	0	0	0
RCHEM	16995	94531691	87411	94531691	whole-rock M	43.17	1.64	10.23	13.22	3.99	8.31	0.2	5.4	13.82	2.64	0.37	0.12	0	0	0
RCHEM	17438	93206923	51319	93206923	whole-rock M	71.63	0.35	13.5	2.55	1.51	0.94	0.01	0.75	1.56	4.36	4.1	0.08	0	0	0
RCHEM	17457	93206916	51314	93206916	whole-rock M	75.15	0.22	12.77	1.24	0.4	0.76	0	0.1	0.3	3.13	5.82	0.04	0	0	0
RCHEM	17538	93206914	51312	93206914	whole-rock M	71.85	0.36	13.31	3.19	1.49	1.53	0.04	0.65	1.48	3.43	4.5	0.1	0	0	0
RCHEM	17775	92208016	42747	92208016	whole-rock M	70.29	0.66	12.94	6.34	3.68	2.39	0.04	0.86	1.96	6.16	0.19	0.15	0	0	0
RCHEM	19124	86206028	7038	86206028	whole-rock M	48.14	1.79	12.81	0	2.95	11.65	0.17	6.19	9.81	2.66	0.12	0.14	0	0	0
RCHEM	19125	E2/3040	7668	E2/3040	whole-rock M	48.32	1.81	13	0	4.8	13.55	0.32	4.4	7.65	3.7	0.3	0.14	0	0	0
RCHEM	19131	86206053	39345	86206053	whole-rock M	68.99	0.49	14.29	0	2.15	1.48	0.03	0.82	2.33	3.98	4	0.12	0	0	0
RCHEM	19133	86206083	39348	86206083	whole-rock M	72.7	0.19	13.47	0	0.83	0.42	-0.01	0.23	0.85	4.13	5.77	0.07	0	0	0
RCHEM	19143	86206017	7029	86206017	whole-rock M	86.22	0.26	6.54	0	0.45	1.24	0.05	0.5	1.85	1.43	0.58	0.07	0	0	0
RCHEM	19172	86206004	7018	86206004	whole-rock M	97.83	0.04	0.89	0	0.06	0.14	-0.01	0.02	0.03	0.16	0.18	0.03	0	0	0
RCHEM	19206	E3/3046	7672	E3/3046	whole-rock M	63.78	0.47	18.56	0	0.53	0.1	-0.01	0.03	0.03	0.93	14.21	-0.01	0	0	0
RCHEM	19249	86206024	7034	86206024	whole-rock M	47.19	2.59	12.65	0	4	15.03	0.45	3.91	9.18	2.48	0.4	0.19	0	0	0
RCHEM	19250	86206085	7086	86206085	whole-rock M	72.1	0.24	13.69	0	1.72	0.84	0.01	0.4	0.86	5.01	3.59	0.07	0	0	0
RCHEM	19260	86206019	7031	86206019	whole-rock M	88.87	0.2	5.02	0	0.55	1.3	0.05	0.49	0.99	1.02	0.72	0.07	0	0	0
RCHEM	19310	86206090	7090	86206090	whole-rock M	76.22	0.12	11.96	0	0.74	0.41	-0.01	0.04	0.71	3.23	5.06	0.01	0	0	0
RCHEM	19313	86206027	7037	86206027	whole-rock M	49.54	1.23	13.85	0	1.91	11.15	0.2	6.52	11.17	2.55	0.21	0.09	0	0	0
RCHEM	19315	E2/3041	7669	E2/3041	whole-rock M	55.3	3	15.66	0	3.1	8.35	0.21	1.85	3.97	6.67	0.34	0.22	0	0	0
RCHEM	19716	79205320	2899	79205320	whole-rock M	70.6	0.38	13.8	0	1.62	0.04	1.05	1.66	3.66	4.5	0.1	0.5	0.15	0.15	0.18
RCHEM	19717	78534270E	2944	78534270E	whole-rock M	44.9	2.41	14.4	0	2.31	11.5	0.29	2.37	17.2	2.09	0.78	0.34	0.86	0.3	-0.05
RCHEM	19737	84536105	3218	84536105	whole-rock M	68.72	0.57	14.42	0	1.69	0.77	0.02	0.85	3.04	7.49	0.6	0.17	0.58	0.24	0.4
RCHEM	19740	78530072(	2353	78530072(	whole-rock M	50.1	1.59	12.5	0	7.55	6.65	0.12	5.2	8.8	4.9	1.12	0.18	0.88	0.23	0.05
RCHEM	19766	78534389	2837	78534389	whole-rock M	61	1.54	13.8	0	2.01	6.62	0.13	2.12	4.57	3.79	2.7	0.28	0.84	0.21	0.05
RCHEM	19770	69200043A	3312	69200043A	whole-rock M	53.73	1.09	15.7	0	2.43	7.55	0.22	3.18	6.12	5.47	0.76	0.4	0.42	0	0.05
RCHEM	19796	78534400	2838	78534400	whole-rock M	69.1	0.63	13.6	0	1.8	4.02	0.06	0.7	1.87	3.35	3.28	0.18	0.88	0.21	-0.05
RCHEM	19811	74205676	3379	74205676	whole-rock M	49.99	1.23	14.21	0	3.07	8.35	0.19	7.03	10.31	1.96	1.47	0.11	1.73	0.15	0.05
RCHEM	19845	78531479	2834	78531479	whole-rock M	51.7	1.66	14.2	0	6.25	6.15	0.15	5.3	4.95	3.43	3.56	0.69	1.39	0.26	0.25
RCHEM	19847	78530821	3256	78530821	whole-rock M	50.8	1.42	13.7	0	4.73	7.14	0.47	5.87	8.67	4.12	0.49	0.12	1.16	0.2	0.13
RCHEM	19848	69200035A	3317	69200035A	whole-rock M	49.4	2.18	13.54	0	4.81	13.2	0.41	3.98	8.69	2.09	0.38	0.2	0.57	0	-0.05
RCHEM	19890	84536119	3230	84536119	whole-rock M	70.7	0.35	13.65	0	2.49	1.29	0.03	1.19	0.61	2.12	6.03	0.08	1.27	0.3	0.61
RCHEM	19891	84536120	3231	84536120	whole-rock M	71.29	0.36	13.57	0	2.33	0.81	0.02	0.95	0.65	3.77	4.76	0.08	0.97	0.2	0.45
RCHEM	19900	78530541	2572	78530541	whole-rock M	72.3	0.13	15.5	0	0.73	0.51	0.01	0.27	1.83	5.28	2.13	0.04	0.31	0.09	0.16
RCHEM	19915	74205693	47381	74205693	whole-rock M	50.15	1.76	13.43	0	3.53	7.95	0.19	6.67	8.82	2.27	1.93	0.16	2.36	0.14	0.05
RCHEM	19929	78530593	2924	78530593	whole-rock M	73.9	0.23	13.5	0	0.38	0.61	0.02	0.35	2.05	4.03	3.95	0.09	0.44	0.14	0.25
RCHEM	19986	94531666	87408	94531666	whole-rock M	56.26	1.29	11.82	12.7	4.68	7.22	0.16	4.45	6.12	2.1	0.86	0.07	0	0	0
RCHEM	20043	94531756	87421	94531756	whole-rock M	72.61	0.38	14.07	2.62	2.2	0.38	0.02	1.1	0.62	0.52	3.52	0.02	0	0	0
RCHEM	20081	94532092	87468	94532092	whole-rock M	73.77	0.48	11.27	6.2	5.2	0.9	0.05	1.27	0.2	0.96	2.37	0.08	0	0	0
RCHEM	20934	94532014	87457	94532014	whole-rock M	47.48	2.08	12.2	17.38	7.11	9.24	0.31	3.93	6.52	4.59	1.07	0.17	0	0	0
RCHEM	20935	94531906	87442	94531906	whole-rock M	48	1.41	13.23	15.66	1.88	12.4	0.13	6.98	8.57	2.28	1.09	0.08	0	0	0
RCHEM	20959	94531834	88469	94531834	whole-rock M	68.94	0.54	13.6	5.54	4.96	0.52	0.04	1.11	0.61	1.87	3.49	0.05	0	0	0
RCHEM	20991	94532158	87476	94532158	whole-rock M	66.43	0.64	16.13	6.65	1.67	4.48	0.04	1.78	0.36	1.18	4.02	0.14	0	0	0
RCHEM	21031	94531996	87454	94531996	whole-rock M	72.79	0.48	13.26	3.47	3.06	0.37	0.08	0.81	0.65	2.36	3.14	0.14	0	0	0
RCHEM	21032	94531876	87437	94531876	whole-rock M	68.55	0.57	15.84	3.4	2.51	0.8	0.04	1.36	0.43	2.19	4.21	0.08	0	0	0
RCHEM	21054	94531708	87414	94531708	whole-rock M	48.85	1.06	13.26	12.77	2.2	9.51	0.15	6.91	11.12	2.08	0.34	0.06	0	0	0
RCHEM	21803	92208017	30796	92208017	whole-rock M	56.38	0.91	13.65	14.42	5.8	7.76	0.12	4.04	3.72	4.79	0.85	0.12	0	0	0
RCHEM	22444	88206014	18859	88206014	whole-rock M	72.68	0.27	13.58	1.2	1	0.18	0.02	0.5	1.58	7.74	0.2	0.09	0	0	0
RCHEM	23238	86206066	7071	86206066	whole-rock M	76.24	0.14	13.3	0	0.89	0.28	-0.01	0.02	0.34	6.35	2.17	0.01	0	0	0
RCHEM	23257	86206049	7058	86206049	whole-rock M	74.92	0.18	12.72	0	0.81	0.6	-0.01	0.25	1.03	3.16	5.1	0.03	0	0	0
RCHEM	23259	86206130	7124	86206130	whole-rock M	64.53	0.73	15.3	0	2.75	2.12	0.04	1.26	3.49	5.76	2.49	0.23	0	0	0
RCHEM	23297	86206124	7119	86206124	whole-rock M	67.84	0.31	17.24	0	1.03	1.01	-0.01	0.68	2.36	6.32	1.97	0.1	0	0	0
RCHEM	23318	86206026	7036	86206026	whole-rock M	48.09	0.62	14.61	0	1.84	7.81	0.16	8.85	14.31	1.37	0.17	0.04	0	0	0
RCHEM	23343	86206113	7109	86206113	whole-rock M	74.73	0.43	11.29	0	1.09	3.16	0.07	0.49	1.35	2.5	3.61	0.14	0	0	0
RCHEM	23366	86206018	7030	86206018	whole-rock M	80.15	0.3	9.18	0	0.62	1.94	0.19	0.73	5.8	0.29	0.14	0.12	0	0	0

RCHEM	23367	86206115	7111	86206115	whole-rock M	49.43	1.6	12.99	0	4.6	11.26	0.41	5.53	10.27	0.94	0.86	0.15	0	0	0
RCHEM	23384	86206009	7023	86206009	whole-rock M	20	-0.01	1.36	0	44.84	0.2	0.54	0.22	0.02	0.12	0.32	0.1	0	0	0
RCHEM	23402	86206058	7065	86206058	whole-rock M	69.8	0.38	14.17	0	2.22	1.41	0.02	0.62	1.81	4.06	4.21	0.11	0	0	0
RCHEM	23403	86206061	7068	86206061	whole-rock M	64.68	0.1	18	0	0.76	0.11	-0.01	-0.01	-0.01	0.14	16.06	-0.01	0	0	0
RCHEM	23419	85206009	39305	85206009	whole-rock M	66.61	0.72	15.2	0	3.54	1.77	0.02	1.09	3.41	4.93	1.34	0.17	0	0	0
RCHEM	23823	78534045	41787	78534045	whole-rock M	61	1.42	15.2	0	2.63	1.06	0.05	2.19	6.36	7.3	1.44	0.06	0.51	0.21	0.4
RCHEM	23834	78531234	2927	78531234	whole-rock M	70.1	0.47	14.4	0	1.24	1.43	0.03	0.68	2.06	3.83	4.58	0.12	0.41	0.24	-0.05
RCHEM	23865	78531139	3257	78531139	whole-rock M	51.8	2.03	14.6	0	1.72	8.78	0.16	2.76	15.2	0.97	0.25	0.22	0.51	0.11	0.18
RCHEM	23868	69200045	3320	69200045	whole-rock M	50.6	1.91	13.15	0	4.21	13.7	0.33	4.79	7.08	3.39	0.26	0.19	0.18	0	-0.05
RCHEM	23874	74205699	3382	74205699	whole-rock M	49.55	1.74	13.28	0	3.15	8.3	0.18	6.96	9.9	2.03	1.4	0.15	1.97	0.11	0.05
RCHEM	23880	78534270A	2577	78534270A	whole-rock M	57.3	0.49	9.32	0	2.54	4.74	0.13	6.13	12.1	4.9	0.31	0.01	0.57	0.25	0.63
RCHEM	23885	78531467	2929	78531467	whole-rock M	53.8	1.18	14.9	0	3.81	5.86	0.09	4.34	7.03	4.29	2.27	0.47	0.94	0.23	-0.05
RCHEM	23887	84536116	3227	84536116	whole-rock M	70.71	0.38	13.9	0	1.55	1.65	0.03	0.7	1.56	3.37	4.97	0.09	0.88	0.2	0.17
RCHEM	23941	78530166A	2354	78530166A	whole-rock M	48.3	2.85	12.9	0	0.48	14.1	0.49	5.85	9.1	1.03	1.72	0.3	0.96	1.33	-0.05
RCHEM	23984	78530496	2923	78530496	whole-rock M	75	0.13	13.1	0	0.58	0.28	0.02	0.2	0.6	5.04	4.05	0.05	0.31	0.15	0.35
RCHEM	24021	94531942	87446	94531942	whole-rock M	46.29	1.42	12.77	14.9	5.14	8.78	0.15	6.17	8.49	0.98	0.38	0.1	0	0	0
RCHEM	24118	94531984	87452	94531984	whole-rock M	56.97	0.62	18.18	5.95	4.23	1.55	0.02	2.79	2.37	1.15	5.36	0.13	0	0	0
RCHEM	24119	94531624	87402	94531624	whole-rock M	77.13	0.58	10.23	3.06	1.93	1.02	0.04	0.51	0.88	2.28	0.91	0.04	0	0	0
RCHEM	24179	94531881	87438	94531881	whole-rock M	75.69	0.31	12.74	1.63	1.03	0.54	0.02	0.34	0.19	4.44	3.46	0.05	0	0	0
RCHEM	24241	94531804	87428	94531804	whole-rock M	67.19	0.53	14.89	5.16	4.23	0.84	0.06	1.59	0.3	0.74	5.53	0.07	0	0	0
RCHEM	24501	78534372	39143	78534372	whole-rock M	69.8	0.3	14.7	0	0.57	1.21	0.03	0.8	1.64	5.31	3.52	0.09	1	0.22	0.45
RCHEM	24533	86206054	41882	86206054	whole-rock M	71.78	0.33	13.16	0	1.75	0.92	0.02	0.45	0.85	3.3	5.83	0.05	0	0	0
RCHEM	25005	94531738	87419	94531738	whole-rock M	57.02	1.07	17.77	8.14	5.7	2.2	0.02	3.24	0.6	2.14	3.49	0.03	0	0	0
RCHEM	25006	94531618	87401	94531618	whole-rock M	67.83	0.87	10.22	6.6	2.9	3.33	0.13	1.75	2.88	0.75	1.36	0.05	0	0	0
RCHEM	25026	94531726	87417	94531726	whole-rock M	56.48	1.08	12.27	12.26	6.27	5.39	0.14	4.01	5.05	1.89	0.56	0.07	0	0	0
RCHEM	25042	94531888	87439	94531888	whole-rock M	73	0.34	13.49	2.91	2.19	0.65	0.1	0.63	0.54	3.6	3.05	0.02	0	0	0
RCHEM	25043	94532174	87479	94532174	whole-rock M	41.27	0.42	8.88	4.05	1.73	2.09	0.28	2.67	21.3	1.03	3.27	0.12	0	0	0
RCHEM	25078	94531702	87413	94531702	whole-rock M	49.58	1.84	13.03	15.02	3.57	10.3	0.21	6.45	8.36	3.34	0.36	0.16	0	0	0
RCHEM	25079	94531720	87416	94531720	whole-rock M	56.82	0.99	13.81	10.48	8.11	2.13	0.1	3.73	2.27	3.36	0.48	0.11	0	0	0
RCHEM	25124	94532087	87467	94532087	whole-rock M	78.46	0.43	9.79	4.14	2.2	1.75	0.03	1.04	0.48	1.29	2.36	0.08	0	0	0
RCHEM	25720	92208001	40427	92208001	whole-rock M	80.81	0.39	9.67	1.02	0.31	0.64	0.01	0.11	0.28	2.7	4.14	0.23	0	0	0
RCHEM	25782	92208014	30794	92208014	whole-rock M	79.25	0.28	11.75	0.49	0.08	0.37	0.01	0.14	1.07	5.35	0.95	0.05	0	0	0
RCHEM	27044	86206064	39346	86206064	whole-rock M	62.33	0.54	14.9	0	7.75	0.14	-0.01	0.01	0.01	0.1	13.44	0.05	0	0	0
RCHEM	27046	86206020	7032	86206020	whole-rock M	48.46	1.17	13.03	0	3.87	9.37	0.16	7.68	10.88	2.83	0.4	0.09	0	0	0
RCHEM	27048	86206111	7108	86206111	whole-rock M	69.97	0.64	12.45	0	2.91	3.18	0.15	0.42	3.33	3.5	2.04	0.16	0	0	0
RCHEM	27066	86206120	7116	86206120	whole-rock M	71.4	0.14	15.37	0	1.1	0.79	-0.01	0.26	1.79	6.88	0.64	0.05	0	0	0
RCHEM	27067	F4/3044	7671	F4/3044	whole-rock M	73.11	0.1	15.31	0	0.64	0.23	0.02	0.17	0.91	7.03	1.05	0.03	0	0	0
RCHEM	27101	86206023	7033	86206023	whole-rock M	72.05	0.34	13.25	0	1.53	1.08	0.01	0.41	1.16	4	4.65	0.07	0	0	0
RCHEM	27127	86206021	41881	86206021	whole-rock M	48.27	2.7	12.21	0	3.43	14.4	0.27	4.83	7.62	3.75	0.33	0.25	0	0	0
RCHEM	27130	86206051	7060	86206051	whole-rock M	64.04	0.78	14.36	0	2.92	3.37	0.06	1.87	3.64	3.82	3.32	0.24	0	0	0
RCHEM	27131	86206056	7063	86206056	whole-rock M	62.21	0.49	13.22	0	0.99	3.29	0.14	3.5	9.46	4.96	0.83	0.13	0	0	0
RCHEM	27152	86206052	7061	86206052	whole-rock M	71.2	0.35	13.81	0	1.61	1.04	0.02	0.73	1.85	3.55	4.71	0.09	0	0	0
RCHEM	27178	86206084	47365	86206084	whole-rock M	66.72	0.59	15.13	0	2.55	1.46	0.03	0.96	2.5	5.69	3.31	0.17	0	0	0
RCHEM	27196	86206055	7062	86206055	whole-rock M	72.34	0.33	13.14	0	1.78	0.9	-0.01	0.38	1.2	3.39	5.23	0.05	0	0	0
RCHEM	27208	86206008	7022	86206008	whole-rock M	75.76	0.13	15.96	0	0.52	0.17	-0.01	0.11	0.01	0.19	4.79	-0.01	0	0	0
RCHEM	27237	86206126	39353	86206126	whole-rock M	68.11	0.55	14.82	0	1.75	1.41	0.03	0.71	2.41	4.53	4.18	0.12	0	0	0
RCHEM	27735	69200102	3315	69200102	whole-rock M	47.41	1.74	14.98	0	4.87	11.1	0.21	4.48	8.6	3.29	0.72	0.17	0.24	0	0.2
RCHEM	27744	84536112	3223	84536112	whole-rock M	69.4	0.48	13.95	0	2.34	1.07	0.02	0.99	2.28	6.27	0.94	0.09	0.67	0.15	0.87
RCHEM	27766	84536114	3225	84536114	whole-rock M	70.66	0.41	13.71	0	2.03	1.22	0.02	1.05	1.55	3.28	4.46	0.1	0.71	0.1	0.11
RCHEM	27808	69200058E	3322	69200058E	whole-rock M	45.9	1.23	13.17	0	3.23	11.9	0.33	6.42	10.67	2.17	0.86	0.13	0.6	0	0.65
RCHEM	27878	78531458	2928	78531458	whole-rock M	70.3	0.45	13.6	0	1.06	0.73	0.02	0.87	2.54	7.3	1.46	0.85	0.25	0.27	0.15
RCHEM	27881	78531315	2574	78531315	whole-rock M	71.7	0.36	13.9	0	0.49	0.52	0.02	1.11	2.3	4.87	2.88	0.1	0.52	0.19	0.27
RCHEM	28168	94531786	87425	94531786	whole-rock M	69.72	0.5	14.78	3.56	2.93	0.57	0.08	1.52	0.43	0.88	4.33	0.05	0	0	0
RCHEM	28186	94531750	87420	94531750	whole-rock M	66.43	0.52	17.66	3.94	3.43	0.46	0.02	1.12	0.18	0.15	5.25	0.05	0	0	0
RCHEM	28203	94531696	87412	94531696	whole-rock M	48.92	2.07	12.37	16.05	3.67	11.14	0.22	5.45	8.87	3.35	0.35	0.18	0	0	0
RCHEM	28548	86206060	7067	86206060	whole-rock M	66.64	0.85	15.91	0	1.29	0.93	0.02	1.07	3	8.62	0.74	0.24	0	0	0

RCHEM	28920	94531685	88466	94531685	whole-rock M	51.71	1.08	13.04	12.48	2.27	9.19	0.17	6.69	9.88	2.27	0.54	0.06	0	0	0
RCHEM	28940	94532140	87474	94532140	whole-rock M	67.67	0.61	14.66	6.9	1.39	4.96	0.07	1.88	0.59	1.27	3.58	0.13	0	0	0
RCHEM	29021	94531810	87429	94531810	whole-rock M	70.04	0.54	12.9	5.08	4.42	0.59	0.03	1.12	0.43	1.33	4.64	0.04	0	0	0
RCHEM	29068	94531852	87435	94531852	whole-rock M	50.14	1.49	12.91	14.94	3.83	10	0.17	6.1	7.19	3.18	0.61	0.11	0	0	0
RCHEM	29667	92208002	30790	92208002	whole-rock M	84.1	0.31	6.79	3.37	1.41	1.76	0.05	0.47	0.89	0.96	2.38	0.13	0	0	0
RCHEM	29686	92208018	30792	92208018	whole-rock M	85.99	0.23	8.25	0.1	0.1	0	0	0.04	0.15	4.01	0.43	0.09	0	0	0
RCHEM	29702	92208003	30791	92208003	whole-rock M	67.25	0.55	14.31	5.38	2.35	2.73	0.05	1.76	3.01	3	3.33	0.15	0	0	0
RCHEM	30292	88206019	39636	88206019	whole-rock M	64.37	0.2	16.76	2.21	2.04	0.15	0.01	0.04	0.03	0.17	14.92	0.06	0	0	0
RCHEM	30319	88206016	39635	88206016	whole-rock M	79.05	0.34	9.84	1.23	1.09	0.13	0.02	0.13	0.25	1.1	7.04	0.09	0	0	0
RCHEM	31020	86206006	7020	86206006	whole-rock M	90.79	0.19	5	0	0.09	0.12	-0.01	0.05	0.07	2.78	0.16	0.03	0	0	0
RCHEM	31024	86206007	7021	86206007	whole-rock M	72.08	0.14	15.11	0	0.27	0.1	0.02	0.11	1.87	8.4	0.1	0.03	0	0	0
RCHEM	31030	86206081	7084	86206081	whole-rock M	52.22	1.63	15.55	0	4.82	5.69	0.14	3.69	6.39	4.7	2.52	0.63	0	0	0
RCHEM	31065	86206091	7091	86206091	whole-rock M	60.55	1.36	20.81	0	1.53	1.48	0.03	0.11	4.02	7	1.72	0.06	0	0	0
RCHEM	31084	86206003	39340	86206003	whole-rock M	47.54	1.04	14.1	0	2.1	9.7	0.19	8.43	10.95	2.28	0.36	0.08	0	0	0
RCHEM	31085	86206086	47366	86206086	whole-rock M	74.91	0.21	13.76	0	0.65	0.34	-0.01	0.46	0.56	7.73	0.09	0.07	0	0	0
RCHEM	31144	86206121	7117	86206121	whole-rock M	71.97	0.17	15.02	0	0.76	0.53	-0.01	0.27	1.73	6.81	0.54	0.05	0	0	0
RCHEM	31166	86206139	7131	86206139	whole-rock M	68.64	0.47	15.47	0	1.02	3.31	0.07	1.25	0.73	1.56	4.29	0.14	0	0	0
RCHEM	31174	86206068	7073	86206068	whole-rock M	76.92	0.02	13.35	0	0.11	0.09	-0.01	-0.01	0.01	0.08	4.97	0.02	0	0	0
RCHEM	31175	86206089	7089	86206089	whole-rock M	75.64	0.18	12.63	0	1	0.47	-0.01	0.09	0.83	3.73	4.68	0.02	0	0	0
RCHEM	31201	86206131	7125	86206131	whole-rock M	10.06	1.02	0.26	0	73.86	11.52	0.04	0.4	0.02	0.02	0.02	0.08	0	0	0
RCHEM	31619	69200026	3316	69200026	whole-rock M	52.32	0.9	12.26	0	5.47	6.1	0.05	6.33	8.32	4.65	0.38	0.11	0.58	0	0.5
RCHEM	31648	69200031A	3308	69200031A	whole-rock M	47.56	2.89	12.57	0	5.4	12.9	0.3	4.79	8.78	2.89	0.59	0.28	0.26	0	-0.05
RCHEM	31679	69200032A	3309	69200032A	whole-rock M	46.1	2.64	12.06	0	4.22	13.5	0.33	4.92	7.16	2.16	2.57	0.26	0.49	0	1.25
RCHEM	31741	84536108	3220	84536108	whole-rock M	71.22	0.37	13.8	0	1.86	1.64	0.04	0.56	1.57	3.87	3.87	0.1	0.47	0.1	0.07
RCHEM	31837	78534387	2836	78534387	whole-rock M	67.3	0.68	13.3	0	2.91	3.46	0.06	0.76	2.02	3.75	4.6	0.21	0.63	0.24	0.25
RCHEM	31873	78530270	2939	78530270	whole-rock M	57.6	0.6	8.6	0	1.69	4.98	0.12	6.5	13	4.75	0.58	0.06	0.44	0.47	0.1
RCHEM	31883	78530903	2833	78530903	whole-rock M	70.2	0.4	13.8	0	1.95	1.5	0.02	1.15	1.68	3.58	4.65	0.12	0.74	0.2	0.3
RCHEM	31903	78531139A	2941	78531139A	whole-rock M	68.7	1.28	11.9	0	0.52	3.44	0.07	1.29	10.2	0.96	0.4	0.36	0.18	0.25	0.05
RCHEM	31907	78531103	39106	78531103	whole-rock M	74.7	0.1	13.1	0	0.89	0.17	0.01	0.44	0.4	3.97	4.65	0.04	0.3	0.2	0.11
RCHEM	31920	78534387A	39127	78534387A	whole-rock M	63.7	1.14	13.2	0	2.34	6.18	0.11	1.22	2.63	3.67	4.02	0.33	0.76	0.25	0.25

LOI	REST	TOTAL	AG	ARS	AU	B	BA	BE	BI	CD	CE	CL	CO	CR	CS	CU	DY	ER	EU	F	GA
2.8	0.18	99.93	0.5	6.5	0	0	495	3	-2	0	93	0	24	116	-3	23	0	0	0	0	19
4.16	-0.15	97.36	-0.5	6.5	0	0	1118	2.5	-2	0	91	0	14	73	5	45	0	0	0	0	21
7.28	0.11	99.42	-0.5	9.5	0	0	539	3	-2	0	97	0	16	60	-3	57	0	0	0	0	17
9.68	0.15	100.26	-0.5	23.5	0	0	168	0.5	-2	0	25	0	44	101	3	71	0	0	0	0	21
2.74	0.16	100.23	-0.5	7.5	0	0	284	1	-2	0	50	0	13	178	-3	36	0	0	0	0	18
0.95	0.19	99.54	2	-0.5	0	0	593	5	-2	0	114	0	6	11	-3	22	0	0	0	0	19
5.24	0	100.13	0	2	0	0	4	3	-1	0	43	0	35	48	-5	-1	0	0	0	0	17
0	0	99.61	0	-1	0	0	637	0	0	0	186	0	0	7	0	20	0	0	0	1600	16
4.08	0.2	100.06	0.5	70.5	0	0	450	2.5	-2	0	91	0	46	173	-3	103	0	0	0	0	23
1.85	0.17	100.07	-0.5	4.5	0	0	406	2	-2	0	79	0	10	112	4	14	0	0	0	0	16
4.03	0.22	99.83	-0.5	15	0	0	587	2.5	-2	0	113	0	9	72	3	88	0	0	0	0	25
8.17	-0.22	97.11	-0.5	10	0	0	468	2.5	-2	0	112	0	18	69	4	93	0	0	0	0	18
8.88	0.15	99.87	-0.5	21	0	0	18	1	-2	0	30	0	41	136	-3	33	0	0	0	0	18
4.03	0.25	99.54	-0.5	194.5	0	0	544	3	-2	0	90	0	19	132	4	211	0	0	0	0	32
2.47	0.13	100.01	-0.5	4.5	0	0	263	2.5	-2	0	82	0	15	92	-3	39	0	0	0	0	16
0.81	0.11	99.97	-1	0	0	0	271	1	-2	0	52	0	7	-1	-3	17	0	0	0	0	18
0.81	0.29	99.91	2	2	1.18	0	1539	1	-2	0	83	0	0	4	6	0	0	0	0	0	15
0.87	0.17	99.9	1	-0.5	0	0	580	2	-2	0	64	0	0	3	-5	0	0	0	0	0	17
0.59	0.18	100.06	1	1	-1	0	507	2	-2	0	106	0	0	5	0	17	0	0	0	0	20
1.35	0	99.85	0	0.5	2.65	0	1295	4	-2	0	302	1025	9	4	14	11	0	0	0	800	22
0.84	0	99.97	0	1.5	1.65	0	1665	-1	-2	0	107	300	3	4	0	3	0	0	0	300	5
0.89	0	99.24	0	1	0	0	657	6	-2	0	97	634	5	2	6	7	0	0	0	700	20
1.77	0	99.92	0	2.5	0	0	11	2	-2	0	22	499	49	134	-4	131	0	0	0	-200	20
5.55	0	99.98	0	15	11.2	0	17	-1	-2	0	59	315	46	17	-5	4	0	0	0	-200	9
0.86	0	99.7	0	0.5	0	0	490	5	-2	0	120	346	6	4	0	7	0	0	0	700	19
1.34	0	99.11	0	1	0	0	670	6	-2	0	137	540	13	35	10	7	0	0	0	800	21
0	0	99.51	0	0.5	3.78	0	880	2	-2	0	141	362	8	2	0	9	0	0	0	900	19
0	0	99.77	0	1	0	0	1040	0	0	0	151	0	5	11	0	10	0	0	0	0	17
0	0	99.87	0	0	0	0	50	0	0	0	15	0	0	309	0	158	0	0	0	0	0
0	0	99.47	0	0	0	0	470	0	0	0	160	0	0	10	0	16	0	0	0	0	0
0	0	99.76	0	-1	0	0	156	0	0	0	68	0	0	13	0	5	0	0	0	0	17
0	0	99.27	0	-0.5	-1	0	259	6	-2	0	53	192	4	5	0	67	0	0	0	400	18
0	0	92.77	0	0	0	0	640	0	0	0	0	0	-8	60	0	26	0	0	0	0	0
0	0	99.54	0	0	0	0	80	0	0	0	40	0	0	7	0	33	0	0	0	200	0
0	0	99.11	0	1	0	0	24	0	0	0	180	0	0	14	0	5	0	0	0	0	24
0	0	99.77	0	1	0	0	777	0	0	0	128	0	0	10	0	7	0	0	0	0	17
8.63	0.08	99.18	-0.5	5.5	0	0	179	2	-2	0	51	0	41	208	-3	74	0	0	0	0	18
5.03	0.21	99.74	-0.5	17.5	0	0	558	4	-2	0	126	0	18	134	-3	29	0	0	0	0	29
3.89	0.18	99.87	-0.5	18	0	0	427	4	-2	0	82	0	14	133	-3	13	0	0	0	0	24
2.9	0.13	99.84	-0.5	1.5	0	0	429	2.5	-2	0	64	0	7	143	-3	28	0	0	0	0	15
0.87	0.24	99.81	-1	0	0	0	694	3	-2	0	180	0	8	3	-3	53	0	0	0	0	20
1.25	0.14	99.89	1	-0.5	-1	0	288	4	-2	0	76	0	0	3	6	5	0	0	0	0	19
0	0	99.32	0	0	0	0	100	0	0	0	20	0	0	0	0	100	0	0	0	0	0
0	0	100	0	1	0	0	382	0	0	0	52	0	0	33	0	12	0	0	0	200	13
8.87	0.21	100.15	-0.5	12	0	0	214	1	-2	0	36	0	43	160	3	110	0	0	0	0	17
3.52	0.19	99.98	-0.5	4.5	0	0	482	3.5	-2	0	93	0	11	137	9	5	0	0	0	0	22
2.76	0.13	100.13	-0.5	12	0	0	214	2	-2	0	76	0	11	136	6	11	0	0	0	0	13
3.64	0.09	99.93	-0.5	1.5	0	0	162	1.5	-2	0	98	0	10	90	-3	16	0	0	0	0	11
2.34	0.21	100.11	-0.5	6	0	0	655	1.5	-2	0	72	0	19	124	-3	87	0	0	0	0	10
4.4	0.17	100.14	-0.5	6	0	0	430	3	-2	0	108	0	17	145	3	66	0	0	0	0	23
3	0.14	100.06	-0.5	8.5	0	0	213	2.5	-2	0	70	0	9	162	6	19	0	0	0	0	12
2.25	0.1	99.91	-0.5	3.5	0	0	157	1.5	-2	0	60	0	4	137	-3	15	0	0	0	0	8

1.33	0.3	100.27	2	2.5	0	0	1345	3	-2	0	63	0	0	20	-3	31	0	0	0	0	22
0.48	0.2	99.9	1	-0.5	0	0	1108	2	-2	0	17	0	0	19	-3	6	0	0	0	0	6
2.87	0.55	100.02	2	37.5	0	0	3301	2	-2	0	38	0	0	65	-3	80	0	0	0	0	14
2.1	0	99.81	0	7	0	0	391	3	2	0	64	143	9	44	-5	45	0	0	0	400	18
1.04	0	99.01	0	0.5	0	0	909	5	-2	0	93	647	5	4	-6	5	0	0	0	500	18
0.68	0	99.21	0	1	1.52	0	302	10	-2	0	89	370	2	6	-6	3	0	0	0	200	21
2.62	0	99.47	0	0.5	0	0	709	4	2	0	145	2071	41	143	8	55	0	0	0	1100	20
0.89	0	100.04	0	1.5	0	0	43	11	-2	0	107	448	8	49	0	4	0	0	0	1000	21
1.19	0	99.84	0	0.5	2.99	0	1362	4	-2	0	157	267	6	-2	0	17	0	0	0	0	19
3.23	0	99.98	0	1	0	0	95	1	2	0	13	363	43	203	-3	94	0	0	0	-200	18
1.14	0	100.13	0	2	0	0	641	-1	-2	0	52	73	4	35	-5	-2	0	0	0	500	6
1.02	0	99.44	0	1	0	0	614	3	-2	0	42	330	3	-2	-4	13	0	0	0	-200	21
0.8	0	99.53	0	0.5	1.17	0	663	4	-2	0	133	826	5	-2	8	9	0	0	0	500	19
0	0	99.35	0	0	0	0	280	0	0	0	0	0	41	13	0	36	0	0	0	0	0
0	0	99.29	0	0	0	0	1150	0	0	0	0	0	27	120	0	27	0	0	0	0	0
0	0	99.56	0	0.5	2.58	0	405	5	-2	0	108	183	4	2	0	9	0	0	0	700	20
0	0	99.05	0	0	0	0	100	0	0	0	0	0	62	87	0	130	0	0	0	0	0
0	0	101.07	0	0	0	0	185	0	0	0	0	0	35	11	0	20	0	0	0	0	0
0	0	99.13	0	0	0	0	410	0	0	0	60	0	0	36	0	42	0	0	0	0	0
0	0	101.24	0	0	0	0	410	0	0	0	0	0	54	35	0	130	0	0	0	0	0
0	0	99.32	0	0	0	0	1100	0	0	0	60	0	0	22	0	13	0	0	0	0	0
0	0	99.74	0	-1	0	0	778	0	0	0	91	0	0	3	0	12	0	0	0	0	16
3.11	0.19	100.2	-0.5	32	0	0	377	2	-2	0	100	0	16	173	5	63	0	0	0	0	19
3.62	0.22	100.09	-0.5	6.5	0	0	434	3	-2	0	124	0	16	137	6	48	0	0	0	0	20
3.59	0.2	100.18	-0.5	48.5	0	0	429	4	-2	0	127	0	16	63	4	83	0	0	0	0	20
10.46	0.19	99.49	-0.5	24.5	0	0	346	1.5	-2	0	42	0	47	127	5	171	0	0	0	0	21
2.98	0.22	100.05	-0.5	27	0	0	748	3.5	-2	0	91	0	14	76	-3	52	0	0	0	0	22
0.9	0.16	99.88	-1	0	0	0	698	-1	-2	0	25	0	7	3	-3	8	0	0	0	0	15
1.84	0	99.29	0	0.5	0	0	68	-1	-1	0	19	0	0	25	-4	66	0	0	0	0	22
0	0	99.62	0	1	0	0	991	0	0	0	111	0	10	18	0	20	0	0	0	0	18
3.64	0.2	100.18	-0.5	10.5	0	0	461	3	-2	0	84	0	11	130	7	73	0	0	0	0	23
5.23	0.2	99.9	-0.5	1	0	0	195	0.5	-2	0	39	0	37	218	-3	70	0	0	0	0	17
3.65	0.18	100.06	-0.5	16	0	0	309	2.5	-2	0	94	0	12	165	4	33	0	0	0	0	16
3.79	0.25	99.78	-0.5	5.5	0	0	990	3.5	-2	0	98	0	9	102	7	30	0	0	0	0	27
2.37	0.16	100.18	-0.5	6	0	0	547	1.5	-2	0	46	0	9	109	-3	50	0	0	0	0	12
3.1	0.22	100.04	-0.5	11	0	0	774	3	-2	0	89	0	9	115	-3	17	0	0	0	0	18
12.31	0.2	100.07	-0.5	18	0	0	149	1	-2	0	44	0	46	134	3	281	0	0	0	0	19
3.51	0.15	100.08	-0.5	11.5	0	0	365	3	-2	0	87	0	13	149	4	35	0	0	0	0	18
1.68	0.16	99.87	-1	0	0	0	108	2	-2	0	104	0	8	5	-3	18	0	0	0	0	21
2.33	1.94	99.47	9	86	0	0	13678	6	-2	0	55	0	0	27	-3	188	0	0	0	0	5
1.12	0	99.47	0	2	0	0	108	4	-2	0	132	413	6	10	0	11	0	0	0	-200	17
0.86	0	99.51	0	-0.5	0	0	139	3	-2	0	49	441	4	3	-5	3	0	0	0	600	23
0.81	0	99.94	0	0.5	1.24	0	771	5	-2	0	250	680	6	2	0	5	0	0	0	900	20
0.88	0	99.7	0	1.5	1.45	0	620	7	-2	0	124	279	5	4	0	9	0	0	0	1600	21
0.77	0	99.38	0	1.5	1.43	0	1462	3	-2	0	150	635	6	2	8	7	0	0	0	-200	20
10.89	0	100	0	14	0	0	49	-1	-2	0	15	829	33	52	-4	109	0	0	0	400	18
1.58	0	99.74	0	5	0	0	230	2	-2	0	20	187	47	33	-4	10	0	0	0	-200	20
0.58	0	99.2	0	1	0	0	28	-1	-2	0	8	200	2	4	-3	2	0	0	0	-200	-1
1.1	0	99.39	0	2	1.61	0	981	4	-2	0	151	647	8	6	0	10	0	0	0	1200	20
2.4	0	99.07	0	0.5	0	0	349	1	1	0	21	0	0	76	-4	29	0	0	0	0	22
0	0	100.35	0	0.5	3.45	0	509	3	-2	0	109	191	10	-2	0	93	0	0	0	400	17
0	0	99.59	0	0	0	0	65	0	0	0	75	0	0	0	0	50	0	0	0	0	0
0	0	99.42	0	1	0	0	158	0	0	0	70	0	0	6	0	4	0	0	0	1600	20
0	0	99.35	0	0	0	0	140	0	0	0	20	0	0	0	0	5	0	0	0	0	0
0	0	98.79	0	4	0	0	387	0	0	0	76	487	0	65	0	360	0	0	0	0	0
0	0	99.47	0	0	0	0	80	0	0	0	-10	0	0	0	0	28	0	0	0	0	0

0	0	100	0	0	0	0	210	0	0	0	0	0	48	120	0	50	0	0	0	0	0
0	0	99.13	0	0	0	0	88	0	0	0	0	0	41	13	0	31	0	0	0	0	0
0	0	99.82	0	2	0	0	120	0	0	0	63	0	-5	5	0	6	0	0	0	0	20
1.7	0.13	99.73	-0.5	6	0	0	148	2	-2	0	68	0	10	108	-3	18	0	0	0	0	15
6.53	0.17	99.76	-0.5	1	0	0	148	-0.5	-2	0	9	0	50	161	-3	146	0	0	0	0	13
6.68	0.2	100.09	-0.5	4.5	0	0	199	1	-2	0	24	0	41	162	3	172	0	0	0	0	19
4.09	0.18	99.98	-0.5	7.5	0	0	508	3	-2	0	65	0	14	137	5	12	0	0	0	0	26
3.33	0.3	99.97	-0.5	28	0	0	798	4	-2	0	111	0	15	167	-3	128	0	0	0	0	41
1.25	0	99.01	0	1.5	1.98	0	1501	4	2	0	197	1031	9	3	10	20	0	0	0	1700	22
0	0	99.26	0	1	0	0	179	0	0	0	47	0	-5	7	0	7	0	0	0	0	18
1.96	0.17	100.15	-0.5	4	0	0	453	1.5	-2	0	77	0	8	77	4	7	0	0	0	0	16
4.57	0.2	100.03	-0.5	10.5	0	0	454	3	-2	0	112	0	14	131	7	17	0	0	0	0	23
4.41	0.19	100.17	-0.5	9.5	0	0	543	2	-2	0	97	0	13	72	3	32	0	0	0	0	15
3.57	0.19	100.14	-0.5	55.5	0	0	434	3	-2	0	96	0	55	107	5	54	0	0	0	0	22
4.24	0.34	100.33	-0.5	2	0	0	505	2	2	0	40	0	69	115	13	663	0	0	0	0	23
1.96	0.12	100	-0.5	11.5	0	0	167	1.5	-2	0	64	0	15	139	3	35	0	0	0	0	14
15.09	0.24	100.08	-0.5	10	0	0	386	2	-2	0	30	0	53	231	16	42	0	0	0	0	29
8.66	0.2	100.04	-0.5	9	0	0	220	1	-2	0	46	0	80	88	8	131	0	0	0	0	19
4.98	0.03	98.71	-0.5	4.5	0	0	684	2	-2	0	83	0	12	113	-3	29	0	0	0	0	19
2.59	0.21	100.1	-0.5	61	0	0	564	3	-2	0	158	0	26	85	-3	32	0	0	0	0	19
5.17	0.2	100.09	-0.5	9	0	0	215	1	2	0	34	0	34	139	-3	31	0	0	0	0	17
2.55	0.2	99.88	-0.5	8	0	0	626	2.5	-2	0	76	0	4	134	-3	154	0	0	0	0	22
3.52	0.21	99.93	-0.5	2.5	0	0	324	1	-2	0	67	0	42	98	-3	120	0	0	0	0	17
1.87	0.37	99.9	-1	0	0	0	1050	1	-2	0	104	0	18	26	-3	21	0	0	0	0	25
0.27	0.04	99.97	1	1	0	0	0	1	-2	0	0	0	0	0	0	1	0	0	0	0	9
0.58	0.07	99.96	1	1	0	0	117	1	-2	0	38	0	0	15	5	7	0	0	0	0	3
0.73	0	99.41	0	1	0	0	1279	2	-2	0	56	185	7	54	9	26	0	0	0	300	11
0.53	0	99.89	0	0.5	0	0	112	3	-2	0	56	133	9	6	-5	2	0	0	0	400	24
1.49	0	99.74	0	3	3.14	0	94	1	-2	0	42	176	8	29	-4	7	0	0	0	200	8
3.38	0	99.69	0	6	0	0	305	3	-2	0	103	93	3	60	0	16	0	0	0	1000	18
1.92	0	100.09	0	2	0	0	21	-1	-2	0	4	383	51	263	-3	150	0	0	0	-200	15
0.88	0	99.47	0	2.5	0	0	420	4	-2	0	197	323	13	4	0	28	0	0	0	900	22
0.58	0	100.2	0	2	0	0	1136	3	2	0	120	270	16	11	9	14	0	0	0	-200	24
1.77	0	100.02	0	1	0	0	83	-1	-2	0	8	858	52	406	4	54	0	0	0	-200	15
1.88	0	99.98	0	1	0	0	88	2	-2	0	43	1199	19	-2	-5	7	0	0	0	400	27
1.49	0	99.12	0	1.5	8.14	0	1566	3	-2	0	155	1031	11	8	9	9	0	0	0	1300	22
0.86	0	99.72	0	0.5	1.31	0	333	7	-2	0	102	386	4	6	0	5	0	0	0	600	19
0.8	0	99.14	0	0.5	0	0	1361	3	-2	0	21	240	3	-2	-4	13	0	0	0	200	19
1.16	0	99.67	0	1	0	0	708	6	-2	0	116	651	10	24	8	32	0	0	0	700	19
0	0	99.82	0	0.5	0	0	855	3	-2	0	188	332	5	2	0	2	0	0	0	800	16
0	0	99.4	0	1	0	0	716	0	0	0	146	0	0	11	0	35	0	0	0	0	19
0	0	99.76	0	0	0	0	180	0	0	0	55	0	0	35	0	8	0	0	0	0	0
0	0	99.46	0	1	0	0	692	0	0	0	103	0	5	8	0	11	0	0	0	0	16
0	0	99.74	0	0	0	0	660	0	0	0	140	0	0	11	0	32	0	0	0	0	0
0	0	98.85	0	0	0	0	92	0	0	0	0	0	58	100	0	15	0	0	0	0	0
0	0	100.03	0	-1	0	0	481	0	0	0	142	0	0	6	0	7	0	0	0	0	16
0	0	99.32	0	0	0	0	1550	0	0	0	45	0	0	0	0	10	0	0	0	0	0
1.85	0.14	100.05	-0.5	12	0	0	231	2	-2	0	82	0	12	133	6	24	0	0	0	0	14
5.26	0.2	99.86	-0.5	6.5	0	0	645	3	2	0	88	0	9	105	-3	25	0	0	0	0	19
11.85	0.2	99.95	-0.5	6.5	0	0	164	1	-2	0	53	0	29	56	5	137	0	0	0	0	12
2.25	0.2	99.79	-0.5	9	0	0	802	3.5	-2	0	103	0	5	60	-3	12	0	0	0	0	19
0	0	100.06	0	1	0	0	289	0	0	0	60	0	8	10	0	8	0	0	0	0	18
3.58	0.24	100.04	-0.5	12.5	0	0	667	3	-2	0	132	0	14	142	7	9	0	0	0	0	29
4.62	0.24	99.96	-0.5	21	0	0	823	3	-2	0	87	0	15	126	-3	24	0	0	0	0	27
3.44	0.16	100.02	-0.5	10.5	0	0	395	2.5	-2	0	77	0	10	115	-3	16	0	0	0	0	20
12.3	0.17	99.71	1	10	0	0	45	-0.5	-2	0	24	0	48	110	-3	137	0	0	0	0	18

6.1	0.21	100.03	-0.5	26	0	0	784	2	-2	0	70	0	17	70	3	18	0	0	0	0	17
4.23	0.08	99.23	-0.5	19	0	0	363	1.5	-2	0	76	0	16	177	-3	29	0	0	0	0	16
1.22	0.08	99.97	-0.5	29.5	0	0	107	1	-2	0	24	0	21	174	-3	52	0	0	0	0	5
9.74	0.2	99.83	-0.5	1	0	0	143	0.5	-2	0	21	0	41	172	4	78	0	0	0	0	16
0.9	0.2	99.89	-1	0	0	0	529	2	-2	0	113	0	8	11	-3	22	0	0	0	0	20
0.77	0.25	99.71	-1	0	0	0	1035	2	-2	0	83	0	6	1	-3	10	0	0	0	0	16
1.06	0.26	100.06	-1	0	0	0	530	3	-2	0	166	0	8	7	-3	6	0	0	0	0	20
0.46	0.1	99.88	1	-0.5	0	0	40	2	-2	0	111	0	0	21	4	2	0	0	0	0	17
3.09	0	99.52	0	4	0	0	29	2	-2	0	19	362	48	45	-4	105	0	0	0	400	19
1.86	0	99.85	0	0.5	0	0	22	2	-1	0	24	3031	0	40	-4	4	0	0	0	0	20
1.24	0	99.92	0	1	-1	0	718	4	-2	0	164	644	11	5	0	25	0	0	0	1400	20
1	0	99.65	0	1	0	0	416	3	-2	0	59	550	4	2	5	6	0	0	0	-200	21
0.81	0	100	0	1	0	0	131	2	-2	0	49	259	10	40	5	6	0	0	0	300	8
0.55	0	99.92	0	2	0	0	30	-1	-2	0	15	203	4	3	-4	11	0	0	0	-200	1
1	0	99.62	0	-0.5	0	0	690	1	1	0	11	224	0	23	-3	5	0	0	0	0	15
1.92	0	99.99	0	1	0	0	55	2	-2	0	34	1420	39	-2	5	6	0	0	0	400	27
1	0	99.53	0	1.5	1.62	0	301	8	-2	0	149	532	5	2	0	6	0	0	0	300	22
0.61	0	99.89	0	2	0	0	104	2	-2	0	50	68	8	32	-5	3	0	0	0	300	6
0.84	0	99.33	0	0.5	1.72	0	253	1	-2	0	161	1031	4	-2	0	16	0	0	0	200	17
1.83	0	100.25	0	1.5	0	0	71	2	-2	0	16	881	52	110	-4	134	0	0	0	-200	18
1.41	0	100.08	0	2	0	0	42	1	1	0	60	2089	0	-2	-5	8	0	0	0	0	17
0	0	98.39	0	0	0	0	640	0	0	0	110	0	0	0	0	30	0	0	0	1100	0
0	0	99.7	0	0	0	0	85	0	0	0	25	0	0	0	0	2	0	0	0	0	0
0	0	99.56	0	0.5	0	0	136	4	-2	0	136	3483	5	3	0	10	0	0	0	300	19
0	0	99.87	0	0	0	0	150	0	0	0	75	0	0	0	0	22	0	0	0	0	0
0	0	99.66	0	-1	0	0	614	0	0	0	148	0	12	32	0	18	0	0	0	0	19
0	0	97.12	0	0	0	0	180	0	0	0	0	0	28	17	0	14	0	0	0	0	0
0	0	99.63	0	1	0	0	874	0	0	0	136	0	8	9	0	3	0	0	0	0	19
0	0	99.85	0	1.5	0	0	156	0	0	0	20	505	0	245	0	175	0	0	0	0	0
0	0	99.94	0	-1	0	0	1611	0	0	0	203	0	30	105	0	32	0	0	0	0	17
0	0	99.02	0	0	0	0	780	0	0	0	50	0	0	116	0	11	0	0	0	0	0
0	0	99.4	0	0	0	0	290	0	0	0	0	0	82	36	0	90	0	0	0	0	0
0	0	100.72	0	0.5	2.68	0	592	4	-2	0	130	519	9	-2	0	63	0	0	0	800	19
0	0	100.21	0	0.5	3.07	0	637	3	-2	0	191	235	9	2	0	28	0	0	0	500	18
0	0	99.29	0	-1	0	0	580	0	0	0	50	0	0	5	0	9	0	0	0	0	16
0	0	99.41	0	1.5	0	0	497	0	0	0	32	236	0	175	0	177	0	0	0	0	0
0	0	99.94	0	-1	0	0	583	0	0	0	42	0	0	6	0	4	0	0	0	0	16
4.64	0.19	99.86	-0.5	2	0	0	240	0.5	-2	0	27	0	40	130	-3	99	0	0	0	0	17
4.22	0.23	99.89	-0.5	1.5	0	0	876	3.5	-2	0	107	0	5	42	6	16	0	0	0	0	18
3.43	0.16	100.14	-0.5	6.5	0	0	310	2	-2	0	86	0	11	130	7	67	0	0	0	0	16
5	0.21	99.91	-0.5	15.5	0	0	190	1	-2	0	31	0	45	70	10	87	0	0	0	0	22
3.92	0.19	100.16	-0.5	29	0	0	122	0.5	-2	0	13	0	53	150	3	55	0	0	0	0	20
4.2	0.19	100.12	-0.5	11.5	0	0	518	2.5	-2	0	69	0	11	91	-3	48	0	0	0	0	18
3.14	0.18	100.19	-0.5	11.5	0	0	424	3.5	-2	0	87	0	15	149	5	43	0	0	0	0	22
2.66	0.16	99.96	-0.5	10	0	0	570	2	-2	0	60	0	12	97	-3	19	0	0	0	0	18
3.27	0.21	100.06	-0.5	9.5	0	0	657	3.5	-2	0	72	0	6	87	3	40	0	0	0	0	23
3.68	0.18	99.4	-0.5	1	0	0	91	-0.5	-2	0	18	0	49	165	-3	151	0	0	0	0	17
1.49	0.19	99.82	2	-0.5	0	0	154	3	-2	0	51	0	0	102	5	16	0	0	0	0	21
1.65	0.09	99.58	1	1	1.57	0	30	4	-2	0	84	0	0	4	-6	2	0	0	0	0	22
0.25	0	99.98	0	1	2.9	0	72	7	-2	0	83	118	2	-2	-6	4	0	0	0	-200	21
0.67	0	99.46	0	1	0	0	324	4	-2	0	86	174	5	2	-6	6	0	0	0	400	16
1.04	0	99.74	0	1.5	0	0	884	3	-2	0	245	944	10	8	13	11	0	0	0	1000	21
1.11	0	99.96	0	0.5	0	0	657	4	-2	0	48	505	6	7	-5	2	0	0	0	600	22
2.09	0	99.96	0	3.5	0	0	22	1	2	0	7	265	52	289	-3	107	0	0	0	-200	15
0.86	0	99.72	0	0.5	0	0	725	3	-2	0	75	254	8	75	9	-2	0	0	0	600	13
0.74	0	100.2	0	3.5	0	0	55	3	-2	0	50	45	11	46	-5	13	0	0	0	200	12

2	0	100.04	0	1	0	0	54	3	6	0	21	1134	47	65	-4	17	0	0	0	-200	21
13.2	0	80.91	0	20255	0	0	115	-1	10	0	56	327	140	-2	-5	0	0	0	0	600	1
1.03	0	99.84	0	1.5	0	0	678	5	-2	0	157	540	7	5	0	11	0	0	0	1100	22
0.58	0	100.39	0	1	0	0	2281	-1	-2	0	31	107	4	-2	-4	-2	0	0	0	-200	12
1.21	0	100.01	0	0.5	1.6	0	366	6	-2	0	97	394	9	-2	0	7	0	0	0	0	21
0	0	99.83	0	1	0	0	261	0	0	0	216	0	0	7	0	3	0	0	0	500	18
0	0	99.54	0	-1	0	0	837	0	0	0	226	0	0	9	0	5	0	0	0	1300	16
0	0	99.29	0	0	0	0	20	0	0	0	60	0	0	7	0	7	0	0	0	0	0
0	0	99.74	0	0	0	0	90	0	0	0	0	0	40	39	0	29	0	0	0	0	0
0	0	98.77	0	1.5	0	0	215	0	0	0	30	571	0	265	0	197	0	0	0	0	0
0	0	99.42	0	0	0	0	15	0	0	0	90	0	0	58	0	11	0	0	0	0	0
0	0	99.16	0	-1	0	0	1454	0	0	0	137	0	0	46	0	58	0	0	0	0	17
0	0	100.16	0	0.5	2.75	0	840	5	-2	0	151	336	7	3	0	6	0	0	0	900	18
0	0	99.36	0	0	0	0	200	0	0	0	20	0	0	0	0	5	0	0	0	0	0
0	0	99.86	0	-1	0	0	294	0	0	0	21	0	0	13	0	4	0	0	0	0	15
9.08	0.2	99.95	-0.5	46.5	0	0	63	0.5	2	0	24	0	52	246	-3	85	0	0	0	0	19
6.57	0.22	100.16	-0.5	1.5	0	0	684	3	-2	0	95	0	11	102	10	48	0	0	0	0	26
3.52	0.04	99.11	-0.5	3	0	0	203	1.5	-2	0	117	0	10	131	-3	27	0	0	0	0	12
0.95	0.21	99.97	-0.5	3	0	0	921	2	-2	0	81	0	3	123	-3	20	0	0	0	0	10
3.99	0.23	100.19	-0.5	9	0	0	843	4.5	-2	0	85	0	17	70	6	55	0	0	0	0	19
0	0	99.64	0	0	0	0	700	0	0	0	50	0	0	0	0	5	0	0	0	0	0
1.11	0	99.55	0	2	1.39	0	705	6	-2	0	317	304	7	-2	0	6	0	0	0	1700	21
6.52	0.21	100.01	-0.5	1.5	0	0	280	3.5	2	0	68	0	33	89	13	153	0	0	0	0	24
7.23	0.11	99.41	-0.5	5.5	0	0	303	1.5	-2	0	49	0	23	148	4	35	0	0	0	0	15
6.21	0.13	99.55	-0.5	9.5	0	0	220	1	-2	0	44	0	34	152	-3	87	0	0	0	0	16
2.16	0.21	99.98	-0.5	8.5	0	0	772	3.5	-2	0	110	0	5	60	3	13	0	0	0	0	19
15.93	0.25	99.24	0.5	4	0	0	1226	1.5	-2	0	65	0	17	74	4	158	0	0	0	0	12
2.65	0.22	100.07	-0.5	2.5	0	0	275	1	-2	0	27	0	46	169	-3	80	0	0	0	0	20
7.81	0.21	99.93	-0.5	15	0	0	195	1.5	-2	0	65	0	37	136	5	171	0	0	0	0	20
2.01	0.16	100.08	-0.5	7	0	0	304	2	-2	0	81	0	10	148	6	24	0	0	0	0	12
0.34	0.15	99.78	1	13	0	0	586	1	-2	0	50	0	0	41	4	1	0	0	0	0	8
0.39	0.17	99.86	1	-0.5	0	0	922	1	-2	0	71	0	0	9	-3	2	0	0	0	0	7
0.98	0	100.24	0	1	3.4	0	2291	-1	-2	0	107	76	3	44	0	5	0	0	0	-200	7
2.1	0	100.04	0	3.5	0	0	82	2	-2	0	12	2225	47	162	3	77	0	0	0	-200	17
0.93	0	99.68	0	2	0	0	826	3	-2	0	90	475	11	15	-6	10	0	0	0	300	19
0.85	0	99.26	0	1	0	0	167	3	-2	0	15	230	3	2	-4	7	0	0	0	500	22
1.42	0	100.02	0	6	2.81	0	157	3	-1	0	6	529	0	-2	-3	120	0	0	0	0	23
0.86	0	99.41	0	1.5	0	0	595	7	-2	0	219	326	4	-2	11	16	0	0	0	1700	21
1.94	0	100	0	11	0	0	13	2	-2	0	30	2181	46	-2	4	8	0	0	0	300	23
1.35	0	99.77	0	1.5	1.9	0	841	4	-2	0	169	780	16	29	9	36	0	0	0	1200	21
0.79	0	100.01	0	1.5	0	0	57	12	-2	0	105	383	14	51	0	4	0	0	0	400	19
1.11	0	100.07	0	1	1.62	0	570	4	-2	0	103	447	8	9	0	8	0	0	0	1300	19
1.05	0	100.16	0	4	0	0	966	21	2	0	198	901	9	5	19	16	0	0	0	1200	24
0.92	0	99.65	0	1	3.12	0	468	3	-2	0	194	311	7	-2	0	9	0	0	0	900	19
2.52	0	100.14	0	3	1.47	0	353	3	-2	0	9	571	2	4	-3	5	0	0	0	600	26
1.08	0	99.7	0	0.5	0	0	1201	5	-2	0	229	691	8	2	0	8	0	0	0	1000	19
0	0	98.01	0	0	0	0	105	0	0	0	0	0	40	26	0	14	0	0	0	0	0
0	0	99.52	0	0.5	2.3	0	189	3	-2	0	115	236	9	2	0	37	0	0	0	200	18
0	0	99.41	0	0.5	2.22	0	665	3	-2	0	128	180	8	9	0	20	0	0	0	900	18
0	0	97.26	0	550	0	0	120	0	0	0	0	0	57	170	0	14	0	0	0	0	0
0	0	99.85	0	1	0	0	229	0	0	0	230	0	0	12	0	8	0	0	0	800	19
0	0	99.23	0	1	0	0	370	0	0	0	170	0	0	14	0	23	0	0	0	0	17
3.81	0.19	99.79	-0.5	12.5	0	0	498	3	-2	0	117	0	14	66	5	116	0	0	0	0	19
4.31	0.26	99.84	-0.5	1	0	0	915	3.5	-2	0	109	0	12	64	9	70	0	0	0	0	22
3.3	0.23	100.12	-0.5	-0.5	0	0	119	0.5	-2	0	24	0	44	149	7	93	0	0	0	0	21
0.74	0	100.05	0	1.5	1.49	0	133	5	-2	0	189	352	7	3	0	15	0	0	0	300	23

2.6	0.18	99.68	-0.5	2	0	0	143	0.5	-2	0	19	0	53	126	-3	162	0	0	0	0	16
2.95	0.17	99.93	-0.5	19	0	0	340	3.5	-2	0	107	0	16	156	10	27	0	0	0	0	20
3.84	0.2	100.12	-0.5	9	0	0	688	3	-2	0	60	0	8	87	-3	59	0	0	0	0	17
3.92	0.21	99.86	-0.5	4	0	0	245	0.5	-2	0	26	0	49	133	-3	102	0	0	0	0	19
0.77	0.14	100.16	1	-0.5	0	0	432	2	-2	0	65	0	0	53	4	28	0	0	0	0	7
0.46	0.06	99.81	1	12.5	0	0	24	1	-2	0	51	0	0	30	-3	10	0	0	0	0	5
1.06	0.25	99.8	1	-0.5	0	0	771	3	-2	0	155	0	0	42	11	9	0	0	0	0	21
0.93	0.38	100.06	2	1	-1	0	2177	1	-2	0	107	0	0	1	0	1	0	0	0	0	10
0.64	0.28	100	1	2	1.09	0	1446	4	-2	0	91	0	0	4	-6	0	0	0	0	0	5
0.47	0	99.74	0	1.5	0	0	47	-1	-2	0	75	148	3	16	-6	4	0	0	0	-200	3
1.78	0	100.01	0	3	1.29	0	51	2	-2	0	-3	201	6	5	-3	-2	0	0	0	-200	20
1.51	0	99.49	0	1.5	1.3	0	813	4	-2	0	166	1640	29	33	9	29	0	0	0	1600	24
0.89	0	99.56	0	1	0	0	466	5	-2	0	41	497	6	4	-4	2	0	0	0	-200	27
3.38	0	100.15	0	3.5	0	0	122	1	-2	0	9	203	52	263	3	97	0	0	0	-200	16
0.68	0	99.45	0	0.5	-1	0	11	5	-2	0	66	234	3	3	-5	4	0	0	0	300	20
1.54	0	99.38	0	-0.5	0	0	95	4	-2	0	33	197	5	2	-4	7	0	0	0	600	20
2.49	0	99.44	0	5	0	0	423	3	-2	0	64	254	10	51	-5	23	0	0	0	500	18
4.43	0	99.98	0	1	-1	0	79	2	-2	0	105	358	2	11	0	3	0	0	0	-200	31
0.68	0	99.94	0	1.5	-1	0	383	6	-2	0	76	500	4	-2	-6	9	0	0	0	-200	20
2.36	0	99.66	0	3.5	2.15	0	29	-1	-2	0	15	55	44	-2	9	38	0	0	0	-200	30
0	0	97.97	0	0	0	0	250	0	0	0	0	0	26	135	0	82	0	0	0	0	0
0	0	99.16	0	0	0	0	160	0	0	0	0	0	50	36	0	22	0	0	0	0	0
0	0	97.66	0	0	0	0	970	0	0	0	0	0	62	90	0	170	0	0	0	0	0
0	0	99.54	0	0.5	3.23	0	495	5	-2	0	159	400	9	3	0	2	0	0	0	1400	20
0	0	100.17	0	1	0	0	636	0	0	0	152	0	5	10	0	11	0	0	0	0	20
0	0	99.49	0	0	0	0	40	0	0	0	55	0	0	0	0	15	0	0	0	0	0
0	0	100.29	0	-1	0	0	646	0	0	0	109	0	5	13	0	30	0	0	0	0	15
0	0	99.6	0	0	0	0	20	0	0	0	30	0	0	7	0	7	0	0	0	0	0
0	0	99.08	0	-1	0	0	120	0	0	0	60	0	0	5	0	13	0	0	0	0	15
0	0	99.8	0	1	0	0	468	0	0	0	55	0	12	17	0	7	0	0	0	0	21

GD	GE	HF	HG	HO	IN	IR	LA	LI	LU	MO	NB	ND	NI	OS	P	PB	PD	PR	PT	RB	S
0	1	5	0	0	0	0	46	18	0	-2	15	40	24	0	0	20	0	9	0	172	720
0	1.5	6	0	0	0	0	48	28	0	3	19	38	18	0	0	11	0	11	0	209	16440
0	0.5	5	0	0	0	0	45	17	0	4	15	41	35	0	0	9	0	11	0	128	3850
0	-0.5	2	0	0	0	0	-2	9	0	-2	5	15	63	0	0	-2	0	3	0	23	-10
0	1.5	3	0	0	0	0	24	10	0	3	10	20	21	0	0	12	0	6	0	48	310
0	2.5	7	0	0	0	0	65	9	0	5	28	36	7	0	0	10	0	10	0	192	600
0	0	0	0	0	0	0	20	5	0	-3	10	19	16	0	0	4	0	4	0	3	0
0	0	0	0	0	0	0	110	4	0	0	21	66	1	0	0	6	0	0	0	204	0
0	1	4	0	0	0	0	43	6	0	2	14	38	30	0	0	2	0	11	0	167	230
0	1	6	0	0	0	0	42	14	0	-2	12	32	16	0	0	28	0	7	0	125	170
0	1	7	0	0	0	0	54	14	0	-2	23	45	10	0	0	10	0	10	0	216	80
0	1	4	0	0	0	0	59	47	0	4	16	45	14	0	0	10	0	7	0	163	16800
0	1	4	0	0	0	0	-2	15	0	3	11	18	50	0	0	-2	0	5	0	6	1150
0	1.5	6	0	0	0	0	42	37	0	-2	21	37	14	0	0	9	0	8	0	153	690
0	2	6	0	0	0	0	38	7	0	-2	13	34	24	0	0	6	0	9	0	131	600
0	4	2	0	0	0	0	17	1	0	-2	7	28	4	0	0	8	0	6	0	24	50
0	-0.5	7	0	0	0	0	32	2	0	-2	30	39	3	0	0	5	1.09	8	0.78	324	-3
0	-0.5	6	0	0	0	0	21	4	0	-2	29	30	1	0	0	4	0	8	0	176	-3
0	-0.5	8	0	0	0	0	57	0	0	-2	21	50	1	0	0	8	-0.5	12	-0.5	81	-3
0	0	0	0	0	0	0	170	5	0	3	27	86	4	0	0	11	0.61	26	-0.5	164	48
0	0	0	0	0	0	0	49	3	0	-3	32	45	3	0	0	3	1.06	13	1.22	204	45
0	0	0	0	0	0	0	54	3	0	-3	18	32	2	0	0	11	0	9	0	229	33
0	0	0	0	0	0	0	7	4	0	5	6	11	67	0	0	4	0	-3	0	2	522
0	0	0	0	0	0	0	31	1	0	-3	6	24	10	0	0	3	0.63	7	0.8	6	57
0	0	0	0	0	0	0	87	6	0	-3	17	21	4	0	0	9	0	8	0	238	65
0	0	0	0	0	0	0	76	17	0	-3	18	42	29	0	0	10	0	12	0	190	91
0	0	0	0	0	0	0	81	15	0	-3	14	36	2	0	0	11	0.73	0	0.51	205	29
0	0	0	0	0	0	0	90	9	0	0	24	56	5	0	0	6	0	0	0	155	0
0	0	0	0	0	0	0	-10	0	0	0	12	0	133	0	0	24	0	0	0	4	0
0	0	0	0	0	0	0	100	0	0	0	40	0	3	0	0	24	0	0	0	280	0
0	0	0	0	0	0	0	53	3	0	0	8	15	10	0	0	4	0	0	0	30	0
0	0	0	0	0	0	0	19	10	0	-3	26	27	-2	0	0	5	-0.5	0	-0.5	61	99
0	0	0	0	0	0	0	65	0	0	0	0	0	9	0	0	5	0	0	0	90	1150
0	0	0	0	0	0	0	20	1	0	0	44	0	3	0	0	8	0	0	0	22	0
0	0	0	0	0	0	0	98	1	0	0	35	84	2	0	0	-2	0	0	0	4	0
0	0	0	0	0	0	0	80	13	0	0	24	46	4	0	0	8	0	0	0	233	0
0	1.5	4	0	0	0	0	25	45	0	-2	12	21	84	0	0	12	0	4	0	37	5220
0	2	2	0	0	0	0	54	13	0	-2	21	52	45	0	0	4	0	13	0	222	300
0	1	4	0	0	0	0	30	9	0	-2	17	34	28	0	0	2	0	8	0	179	20
0	0.5	5	0	0	0	0	27	16	0	2	15	25	11	0	0	6	0	6	0	96	1630
0	4	6	0	0	0	0	108	4	0	2	31	52	2	0	0	11	0	15	0	233	80
0	1	8	0	0	0	0	26	-1	0	-2	30	39	0	0	0	9	0.6	8	0.51	84	-3
0	0	0	0	0	0	0	-20	0	0	0	5	0	0	0	0	-2	0	0	0	20	0
0	0	0	0	0	0	0	40	3	0	0	7	17	21	0	0	5	0	0	0	64	0
0	0.5	-2	0	0	0	0	12	23	0	-2	7	16	76	0	0	7	0	4	0	67	40
0	1	5	0	0	0	0	45	18	0	-2	19	39	34	0	0	8	0	8	0	171	90
0	1	4	0	0	0	0	36	10	0	-2	12	28	26	0	0	4	0	9	0	112	20
0	0.5	5	0	0	0	0	49	23	0	-2	16	41	7	0	0	7	0	11	0	40	1370
0	0.5	13	0	0	0	0	33	3	0	-2	10	29	13	0	0	12	0	7	0	100	20
0	1	4	0	0	0	0	51	13	0	-2	17	43	36	0	0	15	0	10	0	200	1330
0	1	4	0	0	0	0	36	12	0	2	11	31	23	0	0	5	0	7	0	157	110
0	0.5	4	0	0	0	0	30	5	0	-2	12	25	6	0	0	11	0	8	0	26	20

0	2	9	0	0	0	0	31	10	0	4	15	28	9	0	0	31	0	7	0	280	290
0	1.5	6	0	0	0	0	7	3	0	-2	12	4	3	0	0	6	0	3	0	97	110
0	1.5	7	0	0	0	0	23	3	0	7	15	19	9	0	0	175	0	3	0	248	240
0	0	0	0	0	0	0	30	15	0	-3	12	25	18	0	0	229	0	7	0	173	232
0	0	0	0	0	0	0	47	4	0	-3	18	32	3	0	0	6	0	10	0	80	94
0	0	0	0	0	0	0	30	3	0	-3	42	37	2	0	0	10	0.63	10	0.5	55	65
0	0	0	0	0	0	0	71	12	0	5	30	55	69	0	0	7	0	13	0	75	990
0	0	0	0	0	0	0	41	9	0	3	51	43	17	0	0	9	0	11	0	17	22
0	0	0	0	0	0	0	92	17	0	-2	32	59	4	0	0	6	-0.5	17	0.51	163	319
0	0	0	0	0	0	0	10	19	0	5	4	8	67	0	0	5	0	-3	0	19	1542
0	0	0	0	0	0	0	24	3	0	-3	7	21	7	0	0	14	0	6	0	67	23
0	0	0	0	0	0	0	22	5	0	-3	3	14	2	0	0	16	0	4	0	51	166
0	0	0	0	0	0	0	89	6	0	3	17	28	3	0	0	13	-0.5	9	-0.5	264	50
0	0	0	0	0	0	0	64	0	0	0	0	0	25	0	0	5	0	0	0	-10	450
0	0	0	0	0	0	0	185	0	0	0	0	0	52	0	0	20	0	0	0	120	450
0	0	0	0	0	0	0	60	5	0	-3	25	31	2	0	0	17	0.62	0	0.58	211	180
0	0	0	0	0	0	0	64	0	0	0	0	0	80	0	0	5	0	0	0	10	300
0	0	0	0	0	0	0	89	0	0	0	0	0	33	0	0	5	0	0	0	-10	250
0	0	0	0	0	0	0	25	0	0	0	16	0	35	0	0	36	0	0	0	26	0
0	0	0	0	0	0	0	-60	0	0	0	0	0	37	0	0	10	0	0	0	50	300
0	0	0	0	0	0	0	30	0	0	0	22	0	10	0	0	50	0	0	0	280	0
0	0	0	0	0	0	0	58	13	0	0	20	34	3	0	0	6	0	0	0	193	0
0	1	6	0	0	0	0	48	8	0	-2	16	39	24	0	0	6	0	10	0	164	30
0	1	7	0	0	0	0	53	14	0	-2	18	50	40	0	0	8	0	13	0	217	30
0	1.5	5	0	0	0	0	58	20	0	5	24	48	15	0	0	6	0	14	0	220	40
0	1	5	0	0	0	0	17	48	0	5	10	23	67	0	0	8	0	7	0	54	3200
0	1	6	0	0	0	0	45	12	0	-2	21	38	11	0	0	6	0	10	0	146	50
0	3	4	0	0	0	0	16	1	0	3	-2	9	3	0	0	-2	0	3	0	136	130
0	0	0	0	0	0	0	8	8	0	7	8	13	31	0	0	4	0	-3	0	24	0
0	0	0	0	0	0	0	66	6	0	0	15	49	15	0	0	8	0	0	0	110	0
0	1	5	0	0	0	0	42	10	0	-2	14	37	31	0	0	5	0	10	0	191	10
0	-0.5	3	0	0	0	0	15	15	0	3	10	18	60	0	0	9	0	9	0	31	260
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0	1	4	0	0	0	0	45	7	0	-2	21	41	29	0	0	4	0	12	0	254	30
0	0.5	4	0	0	0	0	18	6	0	-2	12	21	12	0	0	9	0	5	0	69	120
0	1	6	0	0	0	0	44	12	0	-2	20	36	13	0	0	5	0	10	0	132	10
0	1	-2	0	0	0	0	13	16	0	-2	8	22	57	0	0	13	0	6	0	50	120
0	1	5	0	0	0	0	41	14	0	-2	16	37	31	0	0	5	0	7	0	161	810
0	3	7	0	0	0	0	35	2	0	-2	34	52	5	0	0	5	0	13	0	16	190
0	9	-2	0	0	0	0	34	1	0	48	7	26	58	0	0	1914	0	8	0	129	150
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0	0	0	0	0	0	0	135	12	0	3	36	73	2	0	0	21	-0.5	22	0.71	282	36
0	0	0	0	0	0	0	66	17	0	-3	31	37	4	0	0	13	0.51	10	0.53	244	339
0	0	0	0	0	0	0	86	2	0	-3	18	62	3	0	0	5	0.68	16	0.51	124	87
0	0	0	0	0	0	0	8	12	0	5	6	10	39	0	0	2	0	-3	0	16	51
0	0	0	0	0	0	0	12	13	0	6	6	15	42	0	0	243	0	4	0	7	68
0	0	0	0	0	0	0	5	-1	0	-3	1	3	3	0	0	4	0	-3	0	4	159
0	0	0	0	0	0	0	78	4	0	-3	25	48	6	0	0	14	0.71	13	0.61	146	330
0	0	0	0	0	0	0	10	12	0	6	6	16	56	0	0	4	0	3	0	9	0
0	0	0	0	0	0	0	38	10	0	-3	26	48	5	0	0	7	1.04	0	0.57	73	126
0	0	0	0	0	0	0	20	0	0	0	8	0	0	0	0	-2	0	0	0	12	0
0	0	0	0	0	0	0	36	7	0	0	46	25	1	0	0	18	0	0	0	336	0
0	0	0	0	0	0	0	-20	0	0	0	5	0	0	0	0	-2	0	0	0	16	0
0	0	0	0	0	0	0	33	0	0	0	18	36	70	0	0	22	0	0	0	68	838
0	0	0	0	0	0	0	30	0	0	0	24	0	0	0	0	-2	0	0	0	13	0

0	0	0	0	0	0	0	-60	0	0	0	0	0	78	0	0	15	0	0	0	30	850
0	0	0	0	0	0	0	62	0	0	0	0	0	23	0	0	5	0	0	0	10	250
0	0	0	0	0	0	0	33	7	0	0	40	22	1	0	0	17	0	0	0	315	0
0	0.5	6	0	0	0	0	30	5	0	3	17	31	33	0	0	4	0	9	0	37	20
0	-0.5	-2	0	0	0	0	3	9	0	5	3	8	86	0	0	-2	0	2	0	17	100
0	0.5	2	0	0	0	0	7	24	0	-2	5	14	70	0	0	6	0	3	0	53	610
0	1.5	3	0	0	0	0	28	18	0	-2	17	24	40	0	0	5	0	7	0	197	240
0	1	11	0	0	0	0	49	9	0	-2	23	47	26	0	0	6	0	10	0	233	20
0	0	0	0	0	0	0	100	4	0	-3	41	74	3	0	0	9	0.5	19	0.51	140	69
0	0	0	0	0	0	0	28	12	0	0	20	22	3	0	0	17	0	0	0	383	0
0	1	7	0	0	0	0	37	13	0	-2	13	32	15	0	0	11	0	8	0	130	20
0	0.5	5	0	0	0	0	57	16	0	-2	18	46	34	0	0	8	0	10	0	211	20
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0	2	5	0	0	0	0	45	13	0	-2	18	38	31	0	0	5	0	12	0	191	140
0	1	-2	0	0	0	0	22	13	0	7	6	18	65	0	0	5	0	4	0	289	180
0	0.5	6	0	0	0	0	30	8	0	2	12	24	26	0	0	4	0	5	0	77	30
0	1	-2	0	0	0	0	9	33	0	-2	6	12	80	0	0	7	0	3	0	264	30
0	0.5	4	0	0	0	0	14	22	0	3	6	26	54	0	0	5	0	4	0	99	470
0	0.5	5	0	0	0	0	39	31	0	3	18	33	16	0	0	11	0	11	0	152	7760
0	0.5	5	0	0	0	0	76	10	0	-2	22	64	9	0	0	10	0	16	0	126	50
0	1	4	0	0	0	0	12	12	0	4	8	17	46	0	0	9	0	9	0	25	170
0	0.5	4	0	0	0	0	38	7	0	-2	16	32	21	0	0	2	0	8	0	136	10
0	1	3	0	0	0	0	25	10	0	-2	8	26	59	0	0	6	0	3	0	41	350
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0	0	0	0	0	0	0	81	6	0	0	25	66	4	0	0	10	0	0	0	233	0
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0	0	0	0	0	0	0	73	7	0	0	21	39	6	0	0	6	0	0	0	183	0
0	0	0	0	0	0	0	40	0	0	0	9	0	9	0	0	-2	0	0	0	5	0
0	0	0	0	0	0	0	30	0	0	-3	12	8	2	0	0	55	0	0	0	200	0
0	0	0	0	0	0	0	19	8	0	0	41	54	8	0	0	8	0	0	0	265	0

SB	SC	SE	SM	SN	SR	TA	TB	TE	TH	TL	TM	U	V	W	Y	YB	ZN	ZR
0	10	-1	0	2	73	-2	0	0	21	0	0	6	63	0	33	0	34	216
0	10	-1	0	3	22	-2	0	0	21	0	0	7	64	0	35	0	78	170
0	9	2	0	2	48	-2	0	0	19	0	0	16	171	0	34	0	11	172
0	47	-1	0	-1	38	-2	0	0	-2	0	0	2	269	0	22	0	29	82
0	8	-1	0	5	45	-2	0	0	14	0	0	4	177	0	22	0	160	116
0	7	-1	0	4	159	-2	0	0	50	0	0	18.5	41	4	42	0	9	224
0	15	0	0	3	9	0	0	0	14	0	0	4	58	0	24	0	9	169
0	4	0	0	-2	60	0	0	0	38	0	0	12	5	0	47	0	11	171
0	16	3	0	3	28	-2	0	0	21	0	0	12.5	87	0	41	0	5	166
0	8	-1	0	2	104	-2	0	0	17	0	0	4.5	44	0	25	0	35	259
0	11	-1	0	4	49	-2	0	0	22	0	0	6	81	0	48	0	31	283
0	13	-1	0	2	59	-2	0	0	16	0	0	6	63	0	42	0	45	199
0	45	-1	0	2	32	-2	0	0	2	0	0	1.5	467	0	36	0	67	132
0	13	7	0	5	12	-2	0	0	19	0	0	5.5	135	0	37	0	37	232
0	9	-1	0	2	59	-2	0	0	18	0	0	5.5	55	0	25	0	17	203
0	3	-1	0	-2	231	-2	0	0	6	0	0	38	7	0	46	0	14	65
0	5	-1	0	3	11	6	0	0	68	0	0	7	17	0	44	0	2	234
0	4	-1	0	7	13	4	0	0	69	0	0	3	23	0	40	0	2	238
0	5	-1	0	2	65	5	0	0	69	0	0	16	25	0	42	0	6	304
0	10	0	0	-2	166	0	0	0	58	0	0	5.5	37	3	49	0	22	518
0	6	0	0	2	18	0	0	0	27	0	0	13	24	5	43	0	3	464
0	9	0	0	2	106	0	0	0	50	0	0	13	10	4	49	0	11	194
0	50	0	0	-2	157	0	0	0	1	0	0	-0.5	402	-2	24	0	91	90
0	16	0	0	2	29	0	0	0	7	0	0	1	26	37	10	0	4	236
0	5	0	0	-2	114	0	0	0	62	0	0	13	15	2	19	0	9	110
0	11	0	0	3	112	0	0	0	59	0	0	6.5	63	2	26	0	27	252
0	5	0	0	3	129	0	0	0	19	0	0	4.5	32	5	19	0	18	280
0	5	0	0	3	239	0	0	0	40	0	0	10	39	0	47	0	21	343
0	0	0	0	0	140	0	0	0	0	0	0	0	0	0	11	0	90	40
0	0	0	0	0	85	0	0	0	0	0	0	0	0	0	50	0	15	250
0	4	0	0	-2	177	0	0	0	35	0	0	9	36	0	7	0	5	173
0	7	0	0	5	157	0	0	0	58	0	0	11	13	6	47	0	10	186
0	0	0	0	0	47	0	0	0	0	0	0	0	80	0	19	0	5	145
0	0	0	0	6	60	0	0	0	65	0	0	55	30	0	26	0	23	160
0	-2	0	0	6	17	0	0	0	38	0	0	5	-2	0	139	0	4	582
0	4	0	0	-2	150	0	0	0	53	0	0	11	36	0	45	0	13	268
0	32	-1	0	1	39	-2	0	0	6	0	0	3.5	288	0	27	0	132	162
0	17	-1	0	5	24	-2	0	0	37	0	0	9.5	101	0	51	0	17	147
0	14	-1	0	3	26	2	0	0	18	0	0	6.5	109	0	30	0	9	163
0	9	-1	0	2	38	-2	0	0	16	0	0	4.5	78	0	32	0	39	199
0	5	-1	0	4	97	4	0	0	61	0	0	17	17	0	50	0	7	183
0	5	-1	0	3	38	3	0	0	70	0	0	19	15	0	48	0	2	244
0	0	0	0	-2	150	0	0	0	-4	0	0	4	140	0	18	0	30	95
0	4	0	0	-2	95	0	0	0	35	0	0	9	36	0	21	0	10	161
0	42	-1	0	2	105	-2	0	0	3	0	0	1	333	0	29	0	84	86
0	12	-1	0	4	39	-2	0	0	24	0	0	6	79	0	35	0	39	180
0	7	-1	0	2	26	-2	0	0	19	0	0	5.5	54	0	25	0	17	150
0	8	-1	0	-1	37	-2	0	0	15	0	0	5	42	0	34	0	24	206
0	6	-1	0	1	38	-2	0	0	14	0	0	5	40	0	20	0	13	392
0	12	-1	0	4	52	-2	0	0	23	0	0	7.5	95	0	40	0	41	165
0	9	-1	0	2	60	3	0	0	19	0	0	3.5	51	0	31	0	22	164
0	5	-1	0	-1	45	-2	0	0	17	0	0	3.5	21	0	33	0	30	162

0	17	-1	0	4	44	-2	0	0	17	0	0	5	34	0	45	0	62	237
0	4	-1	0	-2	64	-2	0	0	12	0	0	4.5	22	0	19	0	4	201
0	11	1	0	2	128	2	0	0	10	0	0	5.5	119	0	17	0	44	172
0	9	0	0	-2	52	0	0	0	17	0	0	4.5	42	3	25	0	429	170
0	9	0	0	-2	205	0	0	0	25	0	0	4.5	36	3	34	0	8	149
0	3	0	0	6	97	0	0	0	75	0	0	21	15	5	50	0	7	219
0	28	0	0	2	299	0	0	0	16	0	0	3	210	2	41	0	71	289
0	16	0	0	8	77	0	0	0	40	0	0	12	63	6	75	0	22	145
0	8	-1	0	3	147	0	0	0	41	0	0	9	37	5	60	0	14	404
0	47	0	0	-2	269	0	0	0	1	0	0	-0.5	316	-2	18	0	76	56
0	3	0	0	-2	30	0	0	0	10	0	0	4	18	4	14	0	12	336
0	3	0	0	-2	490	0	0	0	10	0	0	6	9	-2	5	0	21	108
0	6	0	0	2	88	0	0	0	93	0	0	16	16	4	32	0	7	190
0	48	0	0	0	84	0	0	0	0	0	0	0	700	0	40	0	25	120
0	0	0	0	0	60	0	0	0	0	0	0	0	100	0	52	0	45	155
0	3	0	0	3	58	0	0	0	68	0	0	27	13	4	36	0	16	182
0	44	0	0	0	220	0	0	0	0	0	0	0	310	0	32	0	25	-100
0	33	0	0	0	170	0	0	0	0	0	0	0	530	0	35	0	40	-100
0	0	0	0	0	120	0	0	0	0	0	0	0	0	0	34	0	33	150
0	47	0	0	0	98	0	0	0	0	0	0	0	540	0	33	0	10	100
0	0	0	0	0	46	0	0	0	0	0	0	0	0	0	36	0	124	210
0	2	0	0	-2	221	0	0	0	35	0	0	10	29	0	35	0	22	184
0	8	-1	0	3	23	2	0	0	22	0	0	7	71	0	29	0	7	207
0	12	-1	0	3	38	-2	0	0	30	0	0	9.5	92	0	37	0	44	253
0	8	-1	0	3	27	-2	0	0	21	0	0	6	56	0	51	0	15	236
0	40	-1	0	1	69	-2	0	0	11	0	0	6	409	0	36	0	183	141
0	9	-1	0	3	42	-2	0	0	20	0	0	6	79	0	43	0	12	232
0	-1	-1	0	-2	107	-2	0	0	14	0	0	2	10	0	45	0	13	128
0	47	0	0	2	113	0	0	0	-1	0	0	1	504	0	41	0	20	89
0	15	0	0	3	381	0	0	0	21	0	0	3	141	0	37	0	53	240
0	16	-1	0	3	24	-2	0	0	19	0	0	7	107	0	31	0	9	214
0	35	-1	0	-1	102	-2	0	0	9	0	0	2	293	0	27	0	129	140
0	10	-1	0	3	41	-2	0	0	22	0	0	6.5	90	0	33	0	17	230
0	15	-1	0	4	22	-2	0	0	25	0	0	9	80	0	45	0	8	168
0	8	-1	0	1	51	-2	0	0	13	0	0	4.5	78	0	25	0	13	163
0	9	-1	0	4	25	-2	0	0	19	0	0	5	78	0	58	0	18	232
0	33	-1	0	-1	81	-2	0	0	7	0	0	2.5	284	0	28	0	49	118
0	10	-1	0	3	42	-2	0	0	22	0	0	8	75	0	34	0	15	177
0	7	-1	0	3	150	4	0	0	60	0	0	9	30	0	68	0	6	239
0	5	2	0	-2	67	4	0	0	6	0	0	11	176	0	26	0	506	-1
0	8	0	0	-2	98	0	0	0	75	0	0	9	25	4	51	0	4	221
0	3	0	0	-2	505	0	0	0	6	0	0	2.5	22	-2	6	0	10	119
0	5	0	0	-2	99	0	0	0	92	0	0	25	20	2	27	0	19	250
0	6	0	0	4	90	0	0	0	61	0	0	16	25	3	42	0	14	238
0	10	0	0	3	129	0	0	0	23	0	0	4.5	15	4	64	0	19	214
0	46	0	0	-2	43	0	0	0	1	0	0	-0.5	468	-2	33	0	32	102
0	50	0	0	-2	65	0	0	0	1	0	0	0.5	475	-2	31	0	317	97
0	-3	0	0	-2	3	0	0	0	3	0	0	-0.5	-2	4	7	0	7	34
0	7	0	0	-2	119	0	0	0	77	0	0	8.5	34	3	38	0	13	360
0	46	0	0	-2	113	0	0	0	-1	0	0	0.5	423	0	35	0	61	91
0	6	0	0	2	112	0	0	0	44	0	0	9	36	5	47	0	17	254
0	0	0	0	5	50	0	0	0	4	0	0	16	-20	0	26	0	75	190
0	-2	0	0	-2	32	0	0	0	69	0	0	27	5	0	33	0	15	132
0	0	0	0	22	60	0	0	0	-4	0	0	6	290	0	36	0	18	120
0	34	0	0	0	207	0	0	0	6	0	0	2.5	395	0	44	0	250	240
0	0	0	0	-2	100	0	0	0	-4	0	0	4	290	0	65	0	12	330

0	38	0	0	0	230	0	0	0	0	0	0	0	260	0	27	0	20	-100
0	43	0	0	0	-30	0	0	0	0	0	0	0	450	0	37	0	25	100
0	-2	0	0	-2	28	0	0	0	71	0	0	31	7	0	34	0	16	131
0	10	-1	0	-1	28	-2	0	0	17	0	0	4	85	0	41	0	19	213
0	48	-1	0	-1	116	-2	0	0	-2	0	0	2	292	0	17	0	77	47
0	42	-1	0	1	110	-2	0	0	-2	0	0	1.5	380	0	29	0	91	84
0	13	-1	0	4	20	-2	0	0	23	0	0	6.5	89	0	53	0	25	136
0	25	-1	0	5	25	-2	0	0	31	0	0	9	146	0	49	0	11	367
0	15	0	0	-2	206	0	0	0	38	0	0	9	62	2	68	0	12	610
0	-2	0	0	5	21	0	0	0	26	0	0	16	8	0	28	0	14	71
0	6	-1	0	2	50	-2	0	0	18	0	0	3.5	41	0	24	0	35	253
0	13	-1	0	4	44	-2	0	0	27	0	0	5.5	80	0	39	0	33	154
0	12	-1	0	2	80	-2	0	0	15	0	0	4	127	0	41	0	30	222
0	12	-1	0	3	35	-2	0	0	22	0	0	6	81	0	32	0	11	152
0	43	-1	0	5	62	-2	0	0	-2	0	0	8	460	0	40	0	26	89
0	7	-1	0	2	29	-2	0	0	17	0	0	4.5	53	0	21	0	13	166
0	43	-1	0	2	69	2	0	0	2	0	0	3	313	0	24	0	74	63
0	39	-1	0	2	76	-2	0	0	4	0	0	3	353	0	33	0	62	106
0	12	-1	0	2	56	-2	0	0	26	0	0	5.5	97	0	37	0	58	213
0	11	-1	0	2	47	-2	0	0	24	0	0	6	63	0	67	0	17	200
0	33	1	0	1	77	-2	0	0	10	0	0	3	415	0	32	0	65	166
0	11	-1	0	3	28	-2	0	0	23	0	0	5.5	77	0	33	0	7	177
0	36	-1	0	1	119	-2	0	0	6	0	0	1.5	331	0	35	0	81	121
0	14	1	0	4	322	-2	0	0	20	0	0	4	99	0	43	0	47	356
0	0	-1	0	-2	29	-2	0	0	16	0	0	3	0	0	35	0	-1	190
0	2	-1	0	-2	14	-2	0	0	13	0	0	1	13	0	15	0	16	167
0	5	0	0	-2	73	0	0	0	19	0	0	3	45	2	19	0	87	170
0	10	0	0	-2	100	0	0	0	9	0	0	0.5	15	4	64	0	10	225
0	5	0	0	-2	43	0	0	0	9	0	0	2.5	22	17	15	0	13	361
0	10	0	0	-2	7	0	0	0	16	0	0	19	176	7	34	0	3	192
0	58	0	0	-2	112	0	0	0	1	0	0	-0.5	218	-2	14	0	61	36
0	13	0	0	4	76	0	0	0	39	0	0	11	71	6	96	0	5	604
0	27	0	0	4	165	0	0	0	18	0	0	3.5	88	5	49	0	68	230
0	59	0	0	-2	106	0	0	0	-1	0	0	0.5	329	-2	16	0	87	42
0	39	0	0	3	33	0	0	0	3	0	0	0.5	29	3	79	0	158	242
0	16	0	0	-2	332	0	0	0	11	0	0	1.5	63	4	50	0	30	503
0	8	0	0	6	100	0	0	0	79	0	0	20	25	3	51	0	8	221
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0	7	0	0	2	112	0	0	0	65	0	0	14	21	3	44	0	23	221
0	14	0	0	2	181	0	0	0	32	0	0	8	150	0	50	0	32	352
0	0	0	0	0	620	0	0	0	0	0	0	0	0	0	50	0	35	270
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0	0	0	0	-2	120	0	0	0	50	0	0	18	50	0	42	0	8	260
0	62	0	0	0	-30	0	0	0	0	0	0	0	540	0	41	0	70	125
0	2	0	0	2	106	0	0	0	80	0	0	16	12	0	22	0	21	216
0	0	0	0	-2	180	0	0	0	4	0	0	-4	50	0	60	0	22	280
0	8	-1	0	3	50	-2	0	0	21	0	0	5.5	57	0	25	0	12	172
0	12	-1	0	3	40	-2	0	0	19	0	0	3.5	83	0	49	0	18	214
0	29	-1	0	2	56	-2	0	0	4	0	0	4.5	407	0	50	0	126	144
0	6	-1	0	3	50	-2	0	0	22	0	0	5.5	42	0	44	0	8	167
0	18	0	0	2	144	0	0	0	8	0	0	1	15	0	40	0	51	215
0	15	-1	0	6	29	-2	0	0	31	0	0	7	97	0	46	0	33	169
0	15	-1	0	3	49	2	0	0	20	0	0	7.5	105	0	38	0	42	159
0	10	-1	0	2	32	-2	0	0	19	0	0	6	63	0	28	0	14	195
0	47	-1	0	1	39	-2	0	0	-2	0	0	0.5	461	0	31	0	75	88

0	8	-1	0	2	52	-2	0	0	12	0	0	5	78	0	30	0	35	170
0	9	-1	0	2	33	-2	0	0	11	0	0	6	106	0	30	0	213	167
0	2	-1	0	-1	31	-2	0	0	9	0	0	3.5	21	0	9	0	8	89
0	41	-1	0	1	122	-2	0	0	3	0	0	2	396	0	32	0	70	122
0	6	-1	0	3	109	9	0	0	66	0	0	13	37	0	49	0	3	228
0	2	-1	0	6	115	-2	0	0	135	0	0	10	14	0	62	0	12	237
0	7	-1	0	5	87	4	0	0	44	0	0	15	25	0	63	0	16	253
0	17	-1	0	-2	41	-2	0	0	18	0	0	1.5	41	0	59	0	17	248
0	49	0	0	2	167	0	0	0	3	0	0	-0.5	464	-2	30	0	107	106
0	41	-0.5	0	-2	29	0	0	0	-1	0	0	0.5	486	-2	47	0	49	101
0	9	0	0	2	171	0	0	0	52	0	0	6.5	40	4	54	0	19	329
0	5	0	0	-2	27	0	0	0	70	0	0	25	14	3	33	0	-2	159
0	6	0	0	-2	36	0	0	0	15	0	0	3	24	4	17	0	9	161
0	-3	0	0	-2	2	0	0	0	3	0	0	1.5	2	3	9	0	21	59
0	2	-0.5	0	-2	11	0	0	0	32	0	0	3	27	13	8	0	3	227
0	55	0	0	2	37	0	0	0	1	0	0	-0.5	566	2	53	0	218	131
0	3	0	0	3	38	0	0	0	67	0	0	23	17	3	30	0	6	193
0	4	0	0	-2	21	0	0	0	13	0	0	2	21	2	15	0	24	139
0	-3	0	0	-2	39	0	0	0	68	0	0	5	-3	2	14	0	6	101
0	54	0	0	-2	154	0	0	0	-1	0	0	-0.5	381	-2	25	0	83	69
0	28	-0.5	0	-2	29	0	0	0	2	0	0	1	254	9	41	0	33	129
0	0	0	0	-2	160	0	0	0	46	0	0	16	50	0	34	0	8	270
0	0	0	0	7	540	0	0	0	-4	0	0	4	40	0	48	0	18	220
0	-2	0	0	5	196	0	0	0	53	0	0	10	59	5	53	0	7	323
0	0	0	0	8	95	0	0	0	-4	0	0	4	360	0	28	0	15	140
0	13	0	0	4	133	0	0	0	21	0	0	2	124	0	52	0	82	256
0	22	0	0	0	120	0	0	0	0	0	0	0	210	0	30	0	30	230
0	9	0	0	6	87	0	0	0	27	0	0	6	30	0	37	0	44	420
0	47	0	0	0	180	0	0	0	2	0	0	1.5	295	0	21	0	112	70
0	20	0	0	-2	533	0	0	0	19	0	0	3	253	0	38	0	73	321
0	0	0	0	0	300	0	0	0	0	0	0	0	0	0	26	0	196	80
0	43	0	0	0	86	0	0	0	0	0	0	0	540	0	41	0	100	120
0	7	0	0	3	40	0	0	0	54	0	0	18	31	7	50	0	4	218
0	7	0	0	2	74	0	0	0	49	0	0	18	28	5	41	0	5	216
0	-2	0	0	-2	660	0	0	0	6	0	0	1	6	0	6	0	11	100
0	39	0	0	0	225	0	0	0	3	0	0	0.5	380	0	26	0	98	116
0	3	0	0	-2	134	0	0	0	72	0	0	19	15	0	38	0	10	168
0	38	-1	0	1	101	-2	0	0	8	0	0	2	316	0	28	0	70	128
0	7	-1	0	3	38	-2	0	0	22	0	0	5.5	32	0	59	0	40	257
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0	41	-1	0	2	39	-2	0	0	-2	0	0	3	526	0	45	0	197	130
0	43	-1	0	1	89	-2	0	0	-2	0	0	2	399	0	30	0	64	75
0	10	-1	0	3	34	-2	0	0	16	0	0	4.5	137	0	38	0	19	218
0	10	-1	0	4	33	-2	0	0	24	0	0	7	87	0	38	0	19	172
0	7	-1	0	2	32	-2	0	0	12	0	0	3.5	58	0	24	0	14	178
0	12	-1	0	3	34	-2	0	0	22	0	0	6	66	0	51	0	8	260
0	50	-1	0	-1	130	-2	0	0	-2	0	0	-0.5	348	0	23	0	91	64
0	34	-1	0	5	49	-2	0	0	9	0	0	3.5	205	0	40	0	156	149
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0	-3	0	0	3	12	0	0	0	76	0	0	19	4	3	27	0	2	189
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0	13	0	0	-2	281	0	0	0	41	0	0	5	65	2	51	0	20	335
0	4	0	0	-2	681	0	0	0	9	0	0	2.5	27	-2	6	0	12	174
0	58	0	0	-2	112	0	0	0	1	0	0	-0.5	275	-2	12	0	66	30
0	8	0	0	3	67	0	0	0	19	0	0	3.5	51	2	23	0	59	190
0	11	0	0	2	53	0	0	0	15	0	0	3	36	2	22	0	26	160

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0	10	-1	0	3	35	-2	0	0	19	0	0	3	81	0	39	0	26	223
0	0	0	0	-2	130	0	0	0	32	0	0	8	30	0	12	0	8	170
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0	44	-1	0	1	131	-2	0	0	3	0	0	1.5	434	0	30	0	83	116
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0	5	-1	0	-2	41	-2	0	0	14	0	0	3.5	17	0	27	0	6	210
0	6	0	0	-2	15	0	0	0	29	0	0	6	38	6	41	0	2	306
0	53	0	0	-2	307	0	0	0	2	0	0	-0.5	363	-2	21	0	53	70
0	9	0	0	3	145	0	0	0	20	0	0	4	30	5	47	0	81	254
0	3	0	0	-2	489	0	0	0	6	0	0	48	27	-2	4	0	7	115
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0	5	0	0	5	86	0	0	0	90	0	0	13	20	4	47	0	8	267
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0	18	0	0	8	73	0	0	0	38	0	0	11	74	5	67	0	26	145
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0	11	0	0	8	131	0	0	0	44	0	0	9	49	4	57	0	13	417
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0	-3	0	0	-2	13	0	0	0	2	0	0	0.5	14	3	9	0	3	67
0	9	0	0	-2	214	0	0	0	90	0	0	5	36	4	64	0	16	331
0	47	0	0	0	105	0	0	0	0	0	0	0	490	0	34	0	10	160
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0	7	0	0	3	154	0	0	0	54	0	0	16	39	3	43	0	10	206
0	44	0	0	0	420	0	0	0	0	0	0	0	320	0	30	0	25	100
0	4	0	0	-2	74	0	0	0	116	0	0	8	41	0	58	0	5	419
0	5	0	0	2	120	0	0	0	67	0	0	10	10	0	40	0	11	270
0	8	-1	0	2	30	-2	0	0	18	0	0	6.5	64	0	38	0	15	259
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0	43	-1	0	1	148	-2	0	0	-2	0	0	-0.5	496	0	39	0	162	129
0	11	0	0	5	61	0	0	0	34	0	0	7	41	4	79	0	4	596

0	47	-1	0	-1	119	-2	0	0	6	0	0	2.5	343	0	24	0	104	80
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0	12	-1	0	2	51	-2	0	0	14	0	0	3.5	104	0	36	0	18	202
0	40	-1	0	1	154	-2	0	0	3	0	0	1.5	382	0	28	0	99	91
0	5	-1	0	-2	48	-2	0	0	21	0	0	3	45	0	16	0	14	162
0	3	-1	0	-2	15	-2	0	0	15	0	0	2.5	14	0	17	0	-1	171
0	9	-1	0	3	120	-2	0	0	64	0	0	4	67	0	28	0	24	284
0	1	-1	0	2	14	6	0	0	97	0	0	7	12	0	46	0	1	190
0	6	-1	0	3	7	6	0	0	78	0	0	6	15	0	47	0	2	243
0	-3	0	0	-2	17	0	0	0	9	0	0	3.5	8	7	19	0	20	408
0	4	0	0	-2	59	0	0	0	2	0	0	2	15	2	3	0	3	73
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0	6	0	0	-2	372	0	0	0	14	0	0	5	28	2	11	0	13	886
0	48	0	0	-2	169	0	0	0	1	0	0	-0.5	320	-2	18	0	81	56
0	7	0	0	3	10	0	0	0	66	0	0	16	13	2	53	0	2	182
0	4	0	0	-2	359	0	0	0	9	0	0	4.5	15	-2	5	0	2	115
0	10	0	0	4	36	0	0	0	17	0	0	3	51	-2	23	0	396	157
0	6	0	0	-2	27	0	0	0	46	0	0	8	3	4	35	0	3	202
0	-3	0	0	-2	63	0	0	0	97	0	0	16	7	3	41	0	9	161
0	-3	0	0	-2	-1	0	0	0	-1	0	0	4	469	10	4	0	12	4
0	33	0	0	0	130	0	0	0	0	0	0	0	260	0	26	0	5	-100
0	43	0	0	0	100	0	0	0	0	0	0	0	540	0	46	0	50	190
0	43	0	0	0	130	0	0	0	0	0	0	0	650	0	41	0	100	160
0	7	0	0	2	88	0	0	0	54	0	0	5.5	26	4	30	0	26	240
0	6	0	0	5	69	0	0	0	44	0	0	8	45	0	45	0	41	292
0	0	0	0	10	46	0	0	0	4	0	0	16	30	0	36	0	5	210
0	5	0	0	4	157	0	0	0	57	0	0	10	35	0	35	0	10	171
0	0	0	0	10	380	0	0	0	4	0	0	6	70	0	28	0	51	330
0	-2	0	0	2	30	0	0	0	79	0	0	18	3	0	12	0	18	150
0	10	0	0	7	55	0	0	0	29	0	0	5	81	0	72	0	74	458

Appendix III

Chapter 3 Reworked - Published in Precambrian Research

(Oliver et al, 2008. Oliver:50%, Butera:45%, Others:5%)