GEOCHRONOLOGY OF THE TECTONIC, STRATIGRAPHIC, AND MAGMATIC EVOLUTION OF NEOPROTEROZOIC TO EARLY PALEOZOIC, NORTH AMERICAN CORDILLERA AND CRYOGENIAN GLACIATION

by

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DEDICATION

For my wife

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ABSTRACT

Neoproterozoic sedimentary successions contain evidence for some of the most extreme climate fluctuations, breakup of the paleo-supercontinent Rodina, multiple low-latitude global glaciations, and the resultant evolution and radiation of complex life. The stratigraphic record of these events are found on all major continents and have been associated with, in part, global 'Snowball Earth' events. However, the understanding and integration of these, and related phenomenon, are limited by disparate and imprecise age constraints that prohibit clear correlation between locations.

This research focused on high-precision geochronology within an integrated framework of sedimentology, stratigraphy, and geochemistry to resolve the timing and duration of Neoproterozoic Rodinian rifting and 'Snowball Earth' glaciation recorded in rock units across Idaho. A tandem approach to U-Pb zircon geochronology and geochemistry, combining laser ablation-inductively coupled plasma mass spectrometry (LA-ICPMS) and high-precision U-Pb chemical abrasion-isotope dilution thermal ionization mass spectrometry (CA-IDTIMS), was used to establish a high-fidelity record of pre-, syn-, and post-Rodinian rift sediments, glacigenic sediments, and rift-related magmatism across Idaho.

Results from this research have: 1) documented prolonged pre-to-post Rodinian rifting and basin subsidence; 2) provided the first geochronologic evidence of Cambrian – Ordovician strata in central Idaho; 3) placed firm age constraints on long-duration Sturtian glaciation; 4) provided evidence of Marinoan glaciation; 5) documented duration

and pulse of regional rift-related magmatism; 6) showed the need for *in situ* and isotope dilution analytical techniques to establish clear age constraints in this time and place.

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CHAPTER ONE

LA-ICPMS and CA-IDTIMS age constraints for late-Mesoproterozoic to early-Paleozoic strata in the Edwardsburg – Stibnite area, central Idaho

Abstract

Detrital zircon data have been obtained from 18 samples of metasedimentary roof pendants in the Edwardsburg-Stibnite area of central Idaho. LA-ICPMS data presented here indicate sediment was supplied from multiple source areas, documenting prolonged pre-to-post Rodinian rifting and basin subsidence. Youngest CA-IDTIMS ages of ~693 and 692 Ma place the lower portion of the Edwardsburg Formation within the early Cryogenian (Sturtian) Period. Youngest CA-IDTIMS age of ~653 Ma low in the overlying Moores Station Formation 1 – post-dates the ~717-660 Ma Sturtian timeframe, 2 – likely records rift-related sedimentation of locally uplifted plutonic rocks, and 3 – indicates a significant unconformity in the Edwardsburg area. Similarly, in the Stibnite area, youngest ~668 and 667 Ma dates are also likely locally sourced from exhumed plutons. Additionally, ~503 Ma CA-IDTIMS dates provide the first geochronologic evidence of Cambrian – Ordovician strata in this part of central Idaho.

1. Introduction

The Mesoproterozoic to early Paleozoic was a time of immense change on Earth, including the formation, breakup, and dispersal of the supercontinent Rodinia, global-scale glaciation, and ultimately the appearance of complex life (e.g., Knoll and Walter, 1992; Hoffman et al., 1998; Hoffman and Schrag, 2002). Thick successions of sedimentary and volcanic rocks in the Canadian and U.S. Cordillera preserve more than half a billion years of this Earth history along the western margin of Laurentia (Ross, 1991). Exposures of these deposits are widespread and coherent across much of the northern Cordillera, but occur as structurally dispersed fragments in the Sevier belt and Basin and Range of the central and southern Cordillera (Figure 1).

In central Idaho, stratigraphic and geochronologic studies by Lund et al. (2003; 2010) characterized a northwest-trending series of discontinuous roof pendants as recording pre-, syn-, and post-Rodinian rifting. The roof pendants – composed largely of metasedimentary strata, with minor metavolcanics – form a composite section that may span the late Mesoproterozoic to early Paleozoic rock record. Radioisotopic dating of interbedded volcanic rocks led to correlation of some of the detrital units with the Neoproterozoic Windermere Supergroup, thus providing a link to northern and southern segments of the rifted margin (Lund et al, 2003; 2010). This conclusion was further supported by the discovery of extensive Neoproterozoic through Archean inheritance in the Idaho batholith by Gaschnig et al. (2013). More recently, Ma et al., (2016) recognized Cambrian and Ordovician roof pendants to the south in the Sawtooth Mountains. However, Neoproterozoic and Cretaceous greenschist to amphibolite facies metamorphism, along with Cretaceous and Eocene magmatism, still limits the regional correlation and the determination of a temporal context for these units (e.g., Lund et al., 2003; Gaschnig et al., 2009; Nesheim et al., 2012; Ma et al, 2016).

Recent detailed geologic mapping of the Edwardsburg-Stibnite area of central Idaho (Lewis, Stewart, and Stewart, 2012; Stewart et al., 2013; Stewart et al., 2016), in conjunction with laser ablation-inductively coupled plasma mass spectrometry (LA-ICPMS) and chemical abrasion-thermal ionization mass spectrometry (CA-IDTIMS) detrital zircon (DZ) age results reported here, build on earlier studies by Lund et al. (2003, 2010). We present new U-Pb zircon results from 18 detrital samples to constrain maximum depositional ages of Mesoproterozoic to lower Paleozoic strata in central Idaho, establish detrital reference spectra for comparison with previously reported zircon ages from potentially equivalent units, and speculate on their detrital provenance. Additionally, this study illustrates the need for a significant number of samples, at least in this time period and place, to characterize a composite stratigraphic section, and the utility of tandem in situ and isotope dilution geochronology on the same grains to refine stratigraphic age and provenance models.

2. Geologic Setting

The rock record in the Canadian and U.S. Cordillera preserve the complex evolution of western Laurentia. This history includes the formation and accretion of Archean to Paleoproterozoic basement terranes, Mesoproterozoic rifting, Neoproterozoic rifting and transition to passive margin, Cretaceous through Paleogene contractional deformation and associated volcanism, and Neogene Basin and Range extensional deformation (e.g., DeCelles, 2004; Whitmeyer and Karlstrom, 2007).

2.1. Basement Terranes

The history of early Laurentian craton assembly has been summarized in several papers (e.g., Hoffman, 1988; Percival et al., 2004; Whitmeyer and Karlstrom, 2007; Li et al., 2008). These basement terranes in Laurentia are composed of various blocks that influenced later rift patterns and were sediment sources for younger strata. Importantly, these basement terranes and blocks possess unique age signatures important for establishing potential detrital sources for the strata of the Edwardsburg – Stibnite area (Figure 2). Regional basement rocks include: ~2500-3500 Ma gneissic, plutonic and supracrustal rock of the Wyoming Province (e.g., Mogk, Mueller, and Wooden, 1992;

Frost et al., 1998; Chamberlain et al., 2003; Mueller et al., 2004; Frost et al., 2006a; Frost et al., 2006b); ~1600-2700 Ma metasedimentary and plutonic rock of the Farmington complex (e.g., Mueller et al., 2011; Nelson, Hart, and Frost, 2011); ~2500-2600 Ma metasedimentary and plutonic rock of the Grouse Creek block (Strickland, Miller, and Wooden, 2011; Isakson, 2012); and limited exposures of ~1600-2400, 1840-1880, and 2600-3300 Ma rock from the greater Priest River – Clearwater/Medicine Hat block and bordering Monashee complex and Great Falls tectonic zone (e.g., Ross and Bowring, 1991; Villeneuve et al., 1993; Doughty, Price, and Parrish, 1998; Crowley, 1999; Mueller et al., 2002; Foster et al., 2006; Vervoort et al., 2016).

To the north, these basement terranes are generally adjacent to the ~2000-2400 Ma Wopmay orogen (Bowring and Podosek 1989; Ross, 2002), the ~2000-2100 Ma Peace River Arch region (e.g., Gehrels and Ross, 1998; Gehrels and Pecha, 2014), and the ~1800-2700 Ma and 2000-2600 Ma Rae-Hearn Province to the north and east. Their eastern limit is bounded by the ~1800-2000 and 2400-3200 Ma Trans-Hudson orogen and the dominantly Archean Sask craton and Superior province (e.g., Hoffman, 1988; Bickford et al., 1990; Ansdell et al., 1995; Chiarenzelli et al., 1998; Hollings and Ansdell, 2002; Ross and Villeneuve, 2003; St-Onge, Wodicka, and Ijewliw, 2007; Whitmeyer and Karlstrom, 2007).

Exposures to the south and east of the region possess a wider range of ages. To the south, the Mojave and Yavapai-Mazatzal provinces contain ~1700-2700 and 1600-1800 Ma rocks respectively (Bickford et al., 2008; Shufeldt et al., 2010; Strickland et al., 2013). Additional sediment sources in the southeast include the mid-continent A-type granitic province with ~1300-1500 Ma plutons (Bickford, Van Schmus, and Zietz, 1986) and the ~1000-1300 Ma Grenville province to the east (e.g., Eriksson et al., 2003; Grower and Krogh, 2001; McLelland et al., 2001). A-type granite with ages of 1350-1380 Ma are also present nearby, both to the east near Salmon, Idaho, and to the north, near Elk City Idaho (Evans and Zartman, 1990; Doughty and Chamberlain, 1996).

2.2. Tectonic Setting

The western portion of Laurentia was tectonically active during the Mesoproterozoic through the Neoproterozoic and experienced a prolonged history of rifting and basin formation. This resulted in successive stacked intercontinental rift and passive-margin detrital sequences along the western Laurentian margin, namely the Mesoproterozoic Belt-Purcell Supergroup and Neoproterozoic Windermere Supergroup, along with lesser accumulations of younger deposits following the Paleozoic subsidence of the miogeocline (Hoffman, 1988; Winston and Link, 1993; Thompson , Mercier, and Roots, 1987; Ross, 1991; Lund et al, 2003; Pyle and Barnes, 2003; Lund, 2008; Lewis et al., 2010; Yonkee et al., 2014).

The Mesoproterozoic Belt-Purcell Supergroup is composed of a ~15-20 km thick sequence of metamorphosed siliciclastic and carbonate rocks in southeastern British Columbia, northeastern Washington, western Montana and northern to central Idaho. Preserved sedimentary structures have been used to suggest the rocks represent a rapidly filled, intracratonic rift basin (Winston and Link, 1993). U-Pb ages of syn-sedimentary sills and rare volcanic rocks within Belt-Purcell Supergroup rocks confine sedimentation to ~1470-1400 Ma (Anderson and Davis, 1995; Sears, Chamberlain, and Buckley,1998; Evans et al., 2000). In contrast, the Neoproterozoic Windermere Supergroup represents a widespread assemblage of 3-9 km thick, metamorphosed continental margin deposits that generally extend from northwestern Mexico northward, along the North American Cordillera, into the Yukon-Alaskan border region (Ross, 1991) (Figure 1).

The Windermere Supergroup and subsequent Paleozoic shelf deposits were deposited at a time that coincides with the breakup and dispersal of the supercontinent Rodinia, itself diachronously assembled between ~1300 and 900 Ma (e.g., Meert and Torsvik, 2003; Ross and Arnott, 2006; Li et al., 2008). The assembly of Rodinia likely entailed the accretion of continental blocks around the margin of Laurentia, which, after complete assembly, lasted about 150 million years before breakup began (Torsvik, 2003; Li et al., 2008). Like the assembly, the fragmentation of Rodinia occurred diachronously and is thought to be accompanied by widespread, “snowball Earth” glaciation (Hoffman et al., 1998; Li et al., 2008). Geologic evidence suggests the onset of rifting along the western margin of Laurentia occurred from ~780-700 Ma (e.g., Karlstrom et al., 2000; Colpron, Logan, and Mortensen, 2002; Harlan et al., 2003; Li et al., 2008; Macdonald et al., 2010). Deposition of syn- and post-glacial and marine sedimentary rocks, along with interbedded rift-related volcanic rocks, mark the ensuing transition to drift and associated thermal subsidence along the passive Laurentian margin from the late Neoproterozoic through Cambrian time (e.g., Bond et al., 1985; Levy and Christi-Blick, 1991; Ross, 1991; Colpron et al., 2002; Balgord et al., 2013; Yonkee et al., 2014).

2.3. Regional Stratigraphy

A complex sequence of Windermere-equivalent, metamorphosed roof pendants is dispersed in a northwest-southeast trending belt across central Idaho (Lund et al., 2003; 2010) (Figure 3). The roof pendants consist of sedimentary and volcanic rocks of differing metamorphic grade, mainly greenschist to amphibolite facies, resulting from late-Proterozoic and Jurassic to Cretaceous metamorphic events (DeCelles, 2004; Nesheim et al., 2012; Ma et al., 2016). The strata are displaced by thrust faults, complexly folded, and further isolated within the relatively nondeformed Cretaceous Idaho batholith; more recently they have been displaced by Cretaceous to Tertiary normal faulting. Nevertheless, these deposits form a composite of regionally traceable strata spanning the formation of and final rifting of Rodinia. For most strata in the Edwardsburg area we follow similar terminology and the general framework established in Lund et al. (2003) and Lund (2004), with differences noted in recent mapping efforts by Lewis et al. (2012), Stewart et al., (2013), and in the following sections. To the south at Stibnite, the work of Smitherman (1985) was used extensively by the present authors and many of his unit names are utilized by Stewart et al. (2016) and this study.

2.4. Stratigraphy of Edwardsburg Area

We estimate that over 6,000 m of Neoproterozoic to lower Paleozoic Windermere-equivalent and younger strata are preserved within the Edwardsburg and Stibnite areas of central Idaho (Figure 4). The oldest strata are exposed near Edwardsburg, where the Mesoproterozoic Belt-Purcell Supergroup deposits (Apple Creek Formation) is overlain by a thick (~1,350 m) quartzite unit (Square Mountain Formation) that rests unconformably on the Apple Creek (Figure 5). Lund (2004) shows the base of the Square Mountain Formation as a fault, but deformation along the contact appears to be limited to a minor amount of breccia. The Square Mountain Formation differs significantly from Belt quartzite in that it lacks appreciable feldspar and is poorly sorted. Overlying strata of the Anchor Meadows Formation consist largely of tremolite marble, calc-silicate rocks, and dark siltite, totaling about 970 m. Age constraints on these two units are poor, and it is not clear if they are part of the Windermere Supergroup or an older stratigraphic sequence. Up section, a thin (~75 m) feldspar-poor quartzite of the lower Wind River Meadows Member of the Edwardsburg Formation is in turn overlain by a distinctive matrix-supported conglomerate (diamictite) of the upper Wind River Meadows Member. Clasts in this unit, which is ~135 m thick, are quartzite, siltite, and calc-silicate rocks 1-4 cm across within a calc-silicate or, locally, calcitic matrix; These rocks are in turn overlain by a very thin (~5 m) calc-silicate quartzite at the base of the Gold Cup Member of the Edwardsburg Formation. Most of the Gold Cup Member consists of amphibolite, once mafic volcanic flows but now metamorphosed, along with subordinate fine-grained volcaniclastic rocks. Local plagioclase phenocrysts are preserved, as are calcite-filled vesicles. The upper part of the Edwardsburg Formation is a matrix-supported conglomerate (Placer Creek Member diamictite), ~20 m thick, containing spectacular stretched clasts in a mafic matrix. The clasts are typically 2-8 cm in length and highly varied, consisting of mafic volcanic rocks, quartzite, siltite, and calc-silicate rocks. Above the diamictite is ~100 m of quartzite of the Moores Station Formation. The bulk of the Moores Station Formation is phyllite that contains lenses of marble. The upper part of the formation is intruded by Cretaceous granitic rocks. Lund (2004) distinguished the Goldman Cut Formation from the underlying Moores Station, but our mapping indicated that the difference was more metamorphic than sedimentary and we have included these more schistose rocks in the Moores Station Formation.

The presence of diamictite above and below the mafic flows has drawn comparison to glaciogenic deposits elsewhere in the Windermere Supergroup (Lund et al., 2003). While the diamictites may be reworked glacial material, the small clast size differs significantly from the boulder-bearing diamictites in Windermere strata in northern Utah that seem much more likely to have formed as glacial deposits (Yonkee et al., 2014). Also critical is the presence near Edwardsburg of locally derived mafic volcanic clasts (in the upper diamictite) indicating that these are not distal dropstones. The lack of striations on the clasts near Edwardsburg, the mafic matrix of the upper diamictite, along with presence of carbonate and calc-silicate matrix in the lower diamictite, are also suggestive of a non-glaciogenic origin.

2.5. Stratigraphy of Stibnite Area

Fifteen kilometers to the south of Edwardsburg, and up section, sampled strata from the Stibnite area span the late Neoproterozoic and extend into the early Paleozoic (Stewart et al., 2016). The stratigraphic link between Stibnite and Edwardsburg is tenuous because of intervening Cretaceous intrusive rocks of the Idaho batholith, faulting, and Eocene volcanic cover. The most continuous and most studied part of the section is east of Stibnite, where the lowermost unit defined by Smitherman (1985) is quartzite and schist (Figures 4 and 6). The base of this unit is obscured by intrusion of granitic rocks of the Idaho batholith, but it is overlain by calc-silicate rocks and a locally discontinuous dolomitic carbonate unit (Fern marble). These rocks are in turn overlain by matrix-supported quartz pebble conglomerate that locally contains interbedded schist layers. A relatively thick (~180 m) feldspar-poor quartzite overlies the conglomerate and it itself contains thin conglomerate and granule beds. This conglomeratic and quartzitic interval above the Fern marble was assigned to the Neoproterozoic to Cambrian Umbrella Butte Formation by Lund (2004), an assignment that parallels our present stratigraphic interpretation. Above the quartzite are calc-silicate rocks (upper calc-silicate unit of

Smitherman, 1985), followed in turn by gray marble that is massive to locally ribbon laminated. This marble contains local thin quartzite intervals and is overlain by the thin (~80 m) relatively fine-grained and poorly sorted middle quartzite unit of Smitherman (1985). Above this quartzite is a dolomitic marble (Hermes marble) that is in turn overlain by about 400 m of feldspar-poor fine- to coarse-grained quartzite (upper quartzite). For reasons discussed below, we believe the quartzite is Ordovician in age (Kinnikinic or Eureka equivalent). A thin calc-silicate unit overlies the quartzite, stratigraphically above which a fault repeats some of the older units.

Some of the same stratigraphic sequence outline above is exposed north of Stibnite near Sugar Mountain where the Tamarack Creek anticline repeats the section (Figure 6) and on Missouri Ridge where the middle marble and interbedded quartzite is well exposed. South of Sugar Mountain, the Sugar Mountain fault places younger strata on the north against older strata (Edwardsburg and Moores Station formations) to the south. Our present interpretation is that this fault is an overturned thrust, as discussed in more detail by Stewart et al. (2016).

Less well understood is the relationship of strata northwest of Stibnite, where thick, feldspathic quartzite (quartzite of Profile Creek; >500 m) previously assigned to the Mesoproterozoic Gunsight Formation of the Belt Supergroup (Lund, 2004) is in fault contact with structurally overlying schist and calc-silicate rocks of the Moores Station Formation (Whiskey Creek fault; Figure 6). As shown below, this quartzite contains abundant 1100 Ma zircon grains and is thus younger than the ~1450 Ma Belt Supergroup. The quartzite of Profile Creek contains significant amounts of biotite and is thus darker colored than the other quartzite units in the area. At least some of the feldspar is interstitial and in veinlets and thus is secondary. Both minerals may be reflecting influence of the nearby Idaho batholith, and perhaps a greater degree of metamorphism. The Whiskey Creek fault is marked by well-foliated rocks, but the style of faulting is uncertain. Tentatively, it is thought to be a thrust fault (Stewart et al., 2016).

3. U-Pb Geochronology Methods

Zircon grains were isolated from the 18 samples using standard gravimetric and magnetic separation techniques at the University of Idaho, Washington State University and Boise State University. Grains were randomly selected from the separates of each sample to minimize the population bias then mounted in epoxy disks. The disks were polished to expose the center of zircons, carbon-coated, and imaged by cathodoluminescence (CL). The images were used to identify internal zircon features and morphological traits to determine preferred spot locations for laser ablation. All laser ablation-inductively coupled plasma mass spectrometry (LA-ICPMS) and chemical abrasion-isotope dilution thermal ionization mass spectrometry (CA-IDTIMS) U-Pb analyses were conducted at Washington State University and Boise State University.

LA-ICPMS U-Pb analyses conducted at Washington State University used a New Wave Nd:YAG UV 213-nm laser coupled with a ThermoFinnigan Element 2 single collector, double-focusing, magnetic sector ICP-MS. Operating procedures, parameters, and data reduction are detailed in Chang et al. (2006) and discussed in the Supplemental Data. LA-ICPMS U-Pb analyses conducted at Boise State University used a similar laser ablation system coupled to a ThermoElectron X-Series II quadropole ICPMS. In-house analytical protocols, standard materials, and data reduction are outlined in the Supplemental Data as well.

U-Pb dates were also obtained by the CA-IDTIMS method from select single zircon grains based upon their young LA-ICPMS dates and morphological traits in CL. Zircons were removed from the epoxy mounts and subjected to a modified version of the chemical abrasion method of Mattinson (2005) comprising a single step with concentrated HF at 190°C for 12 hours. U and Pb isotopic measurements were made on an IsotopX Isoprobe-T multicollector thermal ionization mass spectrometer equipped with an ion-counting Daly detector and nine Faraday cups. Method and parameters are outlined in the Supplemental Data.

4. Results

4.1. LA-ICPMS and CA-IDTIMS

Location, lithologic information, and maximum depositional ages are summarized in Table 1. Compiled U-Pb results are graphically illustrated on Figures 7-17. Individual results are listed in Table 1 in Appendix 1A-1E. Dates used in LA-ICPMS probability histograms use only analysis that are within a 10% discordance threshold, positive or negative, based on calculated $^{206}Pb/^{238}U$ and $^{207}Pb/^{206}Pb$ ages. The ages illustrated on these plots are $^{206}Pb/^{238}U$ if the calculated age is <1.0 Ga and $^{207}Pb/^{206}Pb$ if the calculated age is >1.0 Ga.

Select few grains from the youngest LA-ICPMS populations in several samples were chosen for additional CA-IDTIMS analysis in an attempt to more tightly resolve maximum depositional ages. Despite chemical abrasion, nearly all crystals yielded variably discordant CA-IDTIMS dates that form chords with unequal lower intercepts, generally indicative of Mesozoic-Cenozoic Pb-loss or new growth events(s). Multiple, or continuous, periods of Pb-loss complicates primary age interpretation because the upper intercepts always moves toward the origin.

Gaschnig et al. (2010) documented an early plutonic event associated with the Idaho batholith of central Idaho from ~98-85 Ma, followed by more voluminous magmatism between ~80-67 Ma, and two final pulses from ~66-54 Ma. More recently, in the Sawtooth metamorphic complex, Ma et al. (2016) documented ~92 and ~89 Ma metamorphic overgrowths consistent with the early phase of Idaho batholith magmatism. Thus, it is possible that deposits analyzed for this study have experienced multiple thermal episodes potentially contributing to the ubiquitous discordance noted.

Interpreted CA-IDTIMS ages reported here are based on upper intercept dates that are anchored at 94.28 ±0.22 Ma, based on an upper age constraint for local granodiorite associated with the Idaho batholith near Stibnite (sample 14VG8-4B, personal communication with Virginia Gillerman, Idaho Geological Survey). The ~94 Ma date is comparable to those reported by Gaschnig et al. (2010) and Ma et al. (2016) and may reflect the upper limit for the most local event(s) potentially contributing to open system behavior in the samples.

<u>4.1.1. Edwardsburg Area</u>

Two quartzite samples were obtained from the lower and upper portion of the Square Mountain Formation (10RL775 and 10RL774 respectively). Sample 10RL775 is a fine-grained, biotite quartzite collected near the contact with the underlying Belt-Purcell Supergroup, north of the Edwardsburg (Figure 5). Eighty of 117 analyses are ≤10% discordant. Most are ~1600-1800 Ma, with a lesser number at ~1450 Ma and the youngest dates are centered at ~1330 Ma (Figure 7A). Sample 10RL774 is a clean, mostly fine-grained quartzite obtained higher in the section, from southeast of Edwardsburg (Figure 5). Similar to the lower 10RL775 sample, 78 of 123 analyses yielded ≤10% discordant dates. The majority of the dates are within the same ~1600-1800 Ma range, however, eight analyses are younger than 1600 Ma (Figure 7B).

One quartzite (BC14-01) and two diamictite (BC14-02 and BC14-03) samples were obtained from the Wind River Meadows Member of the Edwardsburg Formation, northwest of Edwardsburg (Figure 5). Sample BC14-01 is a fine-grained, white quartzite from the lower part of the Wind River Meadows Member. Ninety-nine of 206 analyses are ≤10% discordant (Figure 8A). They are primarily ~1000-1260 Ma, forming a peak at ~1120 Ma, and others form a lesser peak at ~1300-1500 Ma. The youngest are at ~970 Ma.

Sample BC14-02 is a matrix-supported diamictite containing pebble to small cobble quartzite clasts in a calc-silicate matrix and sample BC14-03 is a more siliceous, matrix-supported diamictite from the upper part of the Wind River Meadows Member. BC14-02 has 103 of 142 analyses that are ≤10% discordant and BC14-03 has 100 of 150 analyses that are ≤10% discordant. Most dates from both samples are ~1000-1500 Ma, with a dominant ~1120-1140 Ma peak equivalent to the underlying Wind River Meadows quartzite, along with minor peaks between ~1600 and 1950 Ma and a few late Archean grains (Figure 8B and 8D). The youngest dates from these diamictite samples are ~672, 757, 860, 892 and 907 Ma. The youngest grains were selected for CA-IDTIMS analysis. The ~672 Ma grain from BC14-02 was split into two pieces that yielded a 692.0 ±6.2 Ma upper intercept (Figure 8C). The four youngest grains (~757, 860, 892 and 907 Ma) from

BC14-03 yielded an upper intercept of 693 ±23 Ma and a spread in older intercepts of ~763, 899, and 916 Ma (Figure 8E).

Sample BC14-04, from the lower-most portion of the Golden Cup Member, is interpreted as a calc-silicate quartzite. It contains abundant plagioclase and amphibole and is unlike any of the underlying diamictite samples. Eighty-five of 158 analyses are ≤10% discordant. They are almost exclusively Archean, with dominant peaks at ~2570, 2950, and 3150 Ma (Figure 9). Within the overlying Placer Creek Member, sample BC14-05 is a matrix-supported, but relatively more clast-rich, diamictite collected northwest of Edwardsburg (Figure 5). Fifty-one of 78 analyses are ≤10% discordant. There is a dominant peak at ~1600-1850 Ma (similar to the Square Mountain Formation quartzite samples), a lesser peak at ~1450 Ma that trends down to a single youngest date at ~1315 Ma, along with a few late Archean dates (Figure 10A). Sixty-five of 104 dates are ≤10% discordant from a fine-grained quartzite from the overlying Moores Station Formation (10RL878). There is a dominant peak at ~1600-1850 Ma a ~1450 Ma peak, a minor ~1320-1390 Ma peak, and two dates at ~609 and ~652 Ma (Figure 10B). These two young grains were split into two pieces each that yielded a CA-IDTIMS upper intercept of 653.2 ± 2.0 Ma and a reversely discordant date (Figure 10C).

4.1.2. Stibnite area

Sample 10RL893 is a medium-gray, coarse-grained, biotite-plagioclase quartzite obtained from a roadcut along Profile Creek, northwest of Stibnite (Figure 6). Seventy-two of 105 dates are ≤10% discordant. Most of them are ~1000-1700 Ma, with peaks at ~1100 and ~1450 Ma, and a few analyses at ~624 and ~770 Ma (Figure 11A). The two youngest grains yielded CA-IDTIMS upper intercepts of 768 ±74 Ma, from two analyses of a split grain, and 786.2 ± 2.0 Ma from a single grain (Figure 11B). Sample 14RL011a, a light-gray, medium-grained quartzite, was taken from the quartzite and schist unit north-northeast of Stibnite (Figure 6) tentatively thought to be slightly younger than the quartzite of Profile Creek. One hundred thirteen of 119 dates are ≤10% discordant. Most form three peaks between ~950 and 1450 Ma, with lesser peaks in the Proterozoic and Archean, and a youngest peak at ~650 Ma (Figure 11C). The four youngest (~635, 653, 653, and 656 Ma) grains yielded a range of CA-IDTIMS upper intercept dates, with the most confident, youngest upper intercept at 668.4 ± 1.2 Ma from a split grain (Figure 11D). The unit could be as young as ~657 Ma, as evidenced by one essentially concordant analysis. However, a geologically implausible, unanchored, lower intercept age results when combined with the other fragment form the same grain.

Up section and residing unconformably over the Fern marble, sample QPC is a poorly sorted, medium- to coarse-grained, matrix-supported quartz pebble conglomerate, obtained from an outcrop north of Stibnite (Figure 6). Eighty-six of 166 dates are ≤10% discordant. Most form three broad peaks between ~1000 and 1900 Ma, with a relatively narrow Archean peak at ~2550 Ma and three dates at ~600 and 650 Ma (Figure 11E). The two youngest QPC grains yielded a CA-IDTIMS upper intercept date of 667.2 ± 1.5 Ma and a slightly older one at 681.5 ± 1.3 Ma (Figure 11F).

Samples 12DS24, 12DS19, and 10RL888 are from variably sorted and locally feldspathic lower quartzite from the east side of Sugar Mountain, northeast of Stibnite and from north of Stibnite, respectively (Figure 6). Dates with ≤10% discordant were obtained from 56 of 131 analyses from sample 12DS24, 49 of 109 analyses from 12DS19, 24 of 137 analyses from 10RL888. All three samples have principle peaks between ~1750 and ~1850 Ma, with minor Paleoproterozoic and Archean contributions and sample12DS24 has a single youngest date at ~1459 Ma (Figures 12 A, B, and C).

One sample from the quartzite within the middle marble was obtained from Missouri Ridge (14DS12), roughly 11 km north-northwest of Stibnite, and the second from southeast of Sugar Mountain (12DS33) (Figure 6). Seventy-four of 121 dates from sample 14DS12 are ≤10% discordant. Most form a dominant peak at ~495 Ma, with a lesser peak at ~1650-1850 Ma, and a few scattered dates up to ~2650 Ma (Figure 13A). Sixty-three of 131 dates from 12DS33 are ≤10% discordant. Most are dispersed between ~1100 and 1800 Ma, forming a large peak at ~1700-1800 Ma, and a comparable dominant youngest peak at ~495 Ma (Figure 13C). Sixteen total zircons from these samples were selected CA-IDTIMS. These dates are variably discordant, yielding $^{206}Pb/^{238}U$ dates from ~447 to ~495 Ma. However, most of the whole grain analyses from both samples plot on similar chords indicative of a single, equivalent upper intercept at 503.3 ± 3.3 Ma from 12DS33 and 502.72 ± 0.99 Ma from 14DS12 (Figures 13 B and D).

Middle quartzite sample 12DS16, positioned stratigraphically above the middle marble, is a medium- to fine-grained quartzite obtained northeast of Stibnite (Figure 6). One hundred eight of 121 dates are ≤10% discordant. The dominant peak is ~1680-1875 Ma, with a few minor peaks at ~1150 and ~1450 Ma and a few late Proterozoic and Archean dates (Figure 14). Upper quartzite sample 12DS14, separated from the middle quartzite by the Hermes marble, was also collected northeast of Stibnite. One hundred two of 110 dates are ≤10% discordant. The principle peak is at ~1830 Ma, with lesser peaks at ~1920, 2100, and 2700 Ma, along with a few at ~1110 and ~1150 Ma (Figure 15).

5. Discussion

5.1. Maximum depositional ages

Detrital zircon (DZ) spectra and maximum depositional ages presented here clearly illustrate that the more than 4000 meters of strata preserved in the Edwardsburg – Stibnite areas of central Idaho span the Cryogenian to Ordovician (Figures 16 and 17). These data document the prolonged evolution and changing sediment sources of the western Laurentian margin, from pre-to-post Rodinian rifting and basin-subsidence. Importantly, this time period also includes what is thought by some to include worldwide glaciation as part of the 'Snowball Earth' hypothesis (e.g., Kirschvink, 1992; Hoffman et al., 1998; Hoffman and Schrag, 2002). As such, it is vital to establish a highly accurate depositional age model.

Fine-scale variability and low n-numbers in young dates determined here increase uncertainty for depositional age models for analyzed samples. Microbeam ages typically rely upon some form of averaging high-n (10-20+ analyses) datasets of relatively imprecise (precision typically 1-4% for $^{206}Pb/^{238}U$ date) determinations. The precision inherent to *in situ* techniques may not be sufficient to clearly determine an age if a sample has experienced some form of open system behavior, yielding varying degrees of discordant data. Discordance results from open system behavior (Pb-loss) or mixing different age domains and yields $^{206}Pb/^{238}U$ dates that are younger than the primary crystallization age; if unrecognized, the young date may be misinterpreted. This is especially likely in rocks that are known to have experienced significant thermal overprints, such as those in roof pendants of large plutons, like the metasedimentary rocks analyzed in this study. It is less of a concern in rocks that were not thermally overprinted.

Where higher-precision time constraints are required, it is possible to date the youngest few zircons identified by relatively imprecise *in situ* techniques by CA-IDTIMS (precision often <0.1%) to better constrain the maximum depositional age. Samples in this study yield LA-ICPMS dates with varying degrees of discordance. Additionally, most young populations determined by LA-ICPMS include a small number of grains. In an attempt to establish robust maximum depositional ages and minimize discordance, select grains underwent chemical abrasion as part of the CA-IDTIMS analysis.

Chemical abrasion dissolves radiation-damaged or altered domains that yield discordant results, thereby significantly reducing, if not eliminating, open system effects that resulted in interpreted depositional ages that are younger than the true age. Chemical abrasion does not typically remove domains that grew during younger events, as was found to be the case in nearly all CA-IDTIMS analyses from this study. However, the relatively high precision of the dates greatly reduces uncertainty when calculating intercept dates. High-precision analyses yield particularly robust upper intercept ages when anchored by geologically reasonable and precise lower intercept dates. Despite chemical abrasion, nearly all crystals yielded discordant CA-IDTIMS results, thus, ages reported are based on upper intercept dates. CA-IDTIMS maximum depositional ages reported here are anchored at ~94 Ma, a local age for potential source of metamorphism that potentially contributed to discordance via recrystallization or new growth.

In the Edwardsburg area, ~693 and 692 Ma upper intercept dates clearly place the Wind River Meadows Member within the early Cryogenian (Sturtian) (Figure 16). The youngest, ~653 Ma intercept age for the Moores Station Formation not only post-dates the Sturtian glaciation (~717-660 Ma), but also likely records rift-related sedimentation of uplifted local Cryogenian plutonic rocks (~650 Ma, Lund et al, 2010). Importantly, the lack of a ~685 Ma signal from the proximal Hogback Rhyolite (Lund et al., 2003) and the incorporation of the young (~653 Ma) grains indicates there must be a significant unconformity between the top of the Edwardsburg Formation and the Moores Station Formation.

Similar to the Moores Station Formation, in the Stibnite area, young grains (~668 and 667 Ma) from the ‘quartzite and schist’ and ‘quartz pebble conglomerate’ units are also likely sourced from exhumed ~665 plutons (Lund et al., 2010) (Figure 17). Higher in the section, ~503 Ma maximum depositional ages clearly place the quartzite of middle marble as Paleozoic to the Late Cambrian, and possibly to the Early Ordovician.

5.2. DZ patterns

In addition to determining maximum depositional age, U-Pb dates of DZ grains are often used to determine provenance by characterizing a spectra of dates that is indicative of possible source regions (e.g., Gehrels, 2000; Fedo, Sircombe, and Rainbird, 2003; Gehrels and Pecha, 2014; Yonkee et al., 2014). In the following discussion, possible original provenance for the samples are hypothesized by comparison with ages of dominant sources of basement rocks throughout North Amerca of the ≤10% discordant data are shown on compiled in the stacked plot (Figures 16 and 17) to facilitate such comparisons.

It is important to recognize that comparisons such as these provide information about where the grain may have originated. We recognize that erosion and recycling of a dominant, local source may be the simplest origination for a detrital zircon, however, most of the grains in this study have likely been cycled through several sedimentary units prior to final deposition into the samples that were taken for analysis. The following discussion is intended to emphasize the changes in sources through time, possible original source location, and possible dispersal history prior to final deposition.

For discussion purposes, the DZ data have been grouped into nine categories based on strata of similar age with similar age patterns (Figures 16 and 17). Four age patterns are evident in the Edwardsburg area (E1-E4) and five age patterns are evident in the Stibnite area (S1-S5). These results are evaluated below from oldest strata to youngest strata.

5.2.1. Edwardsburg Area

U-Pb zircon analyses from the Square Mountain Formation (E1, samples 10RL775 and 10RL774) possess DZ patterns similar to those found in younger Belt-Purcell Supergroup deposits such as those in the Salmon, Idaho area east of Stibnite (Link et al., 2016). Characteristics include a peak population younger than ~1800 Ma, a small population within the North American magmatic gap (~1610-1490 Ma; Ross, Parrish, and Winston, 1992), and a significant syn-Belt peak in the 1470-1430 Ma range. However, sample 10RL775 also possesses enough <1380 Ma analyses to be considered post Belt-Purcell Supergroup (~1470-1400 Ma). The lack of a Grenvillian signature, combined with the maximum depositional age of ~1330 Ma, implies the Square Mountain Formation might predate the Windermere Supergroup and represent a previously unrecognized stratigraphic interval in this region. Potential zircon sources may include distal areas to the south within the Yavapai-Mazatzal Province (Jones III, Daniel and Doe, 2015) or may be reworked from the more local Belt-Purcell strata; the abundance of syn-Belt grains is more indicative of the latter.

Up section within the Edwardsburg Formation, the grouped Wind River Meadow Member samples (E2) represent a marked switch in provenance. The lower Wind River Meadows Member quartzite (sample BC14-01) has a dominant Grenville (1000-1300 Ma) and a smaller A-type granite (~1300-1500 Ma) signature with a shift away from the reworked Belt-Purcell provenance of the underlying Square Mountain Formation quartzite. Most dates from the Wind River Meadows Member diamictite (samples BC14-02 and BC14-03) are broadly similar to the underlying quartzite. The ~1840-1900 Ma peak in the diamictite may indicate a more northerly influence, possibly from the Monashee, Priest River, and Clearwater complexes – although these domains may still have been buried at this time – or the more distal Trans-Hudson orogenic region to the northeast. The youngest grains (CA-IDTIMS intercepts at ~692 and ~693 Ma) document volcanic influences from the earliest Rodinian rifting.

The sample from the overlying Golden Cup Member of the Edwardsburg Formation (14BC-04, E3) continues the trends of distinct shift in DZ provenance. The almost exclusively Archean DZ signature is enigmatic; the Archean signature is broadly similar to dates reported within the Grouse Creek block and Wyoming Province, and may represent a punctuated shift in major provenance. Alternatively, this sample may be simply oversampling local Archean clasts within the diamictite, which have effectively diluted away younger Proterozoic detritus. This sample highlights the unique challenges posed by diamictite facies for DZ provenance analysis.

A shift back to a younger trend (E4) within the Placer Creek Member and lower Moores Station Formation is generally similar to that of the lower Square Mountain quartzite samples (10RL775 and 10RL774) and likely the result of reworked Belt-Purcell Supergroup. The overlying Moores Station Formation quartzite (10RL878) also contains the youngest ~653 Ma CA-IDTIMS upper intercept date for strata in the Edwardsburg area. The age of this grain is comparable to a portion of a nearby syenite-diorite suite of plutonic rocks (Lund et al., 2010). Thus, not only does the Moores Station Formation post-date the Sturtian glaciation, but it also records rift-related sedimentation of uplifted Cryogenian plutonic rocks.

5.2.2. Stibnite Area

The lower two quartzite units east of Stibnite (lower quartzite and schist unit, 14RL011a) and the unconformably overlying quartz-pebble conglomerate (QPC), mark a shift back to a more Grenville and A-type granite DZ pattern (S1). Similarly, the quartzite of Profile Creek (10RL893), which is less constrained stratigraphically but thought to be similar age, shares this same age distribution. Subtle changes in their respective Grenvillian DZ patterns up-section, from narrowly defined ~1100 Ma peak to bi-modal peaks at ~980 and ~1160 Ma to a relatively broad 1000-1300 Ma range, along with lessening A-type granite (~1300-1500 Ma) influence, an increasing abundance of Yavapai-Mazatzal (1600-1800 Ma) and late-Archean (Grouse Creek/southern Wyoming?) grains suggest a more westward progression in provenance up section. These results are similar to those from the Neoproterozoic strata (Blackrock Canyon to lower Camelback Mountain Formations) of southeast Idaho (Yonkee et al., 2014). Similar to the Moores Station Formation quartzite, the few youngest zircons are likely locally sourced from exhumed ~665 Ma plutons (Lund et al., 2010).

The three samples of the overlying ‘lower quartzite’ (12DS24, 12DS19 and 10RL888) have patterns (S2) that again show a marked shift in provenance. The unit possesses a dominant, youngest age peak that just borders the upper Yavapai-Mazatzal range and lacks any A-type granite, Grenvillian, or more local ~650-685 Ma grains. This provenance may be interpreted as reflecting a more westward Mojave province DZ pattern, but it lacks the expected accompanying strong Archean influence. Alternatively, the pattern is strikingly similar to other, more northern, localities, such as the Horsethief Creek and Hamill Groups in southern British Columbia (Gehrels and Pecha, 2014), the Addy Quartzite in northeastern Washington (Linde et al., 2014), the Gold Creek quartzite in northern Idaho (Lewis et al., 2010), the Clayton Mine Quartzite of central Idaho (Baar, 2009; Krohe, 2016) and possibly the Gibbson Jack Formation of southeastern Idaho (Yonkee et al., 2014). The lack of any Grenvillian or Mesoproterozoic granite DZ signature, shown in more southern samples, also supports a likely northward shift in source region.

The two quartzites from within the middle marble (samples 14DS12 and 12DS33) mark yet another sharp transition in provenance (S3). The major ~500 Ma DZ peaks near the Cambrian-Ordovician boundary and relatively minor older peaks indicate the unit may have had a relatively local, eastern or southeastern source from the Late Cambrian and Early Ordovician (485-500 Ma) plutons described by Lund et al. (2010), one of which is located about 60 km east of Stibnite (Figure 3). The abundance of ~500 Ma grains within these samples is similar to the pattern in the Cambrian Worm Creek

Member of the St. Charles Formation in southeast Idaho (Todt, 2014) and some found in the Sawtooth metamorphic complex in south-central Idaho (Ma et al., 2016). The sample from Missouri Ridge (14DS12; Figure 6) is important in that it provides direct age constraints on the Missouri Ridge Formation, previously thought to be Neoproterozoic (Lund et al., 2003; Lund 2004). Although it is clearly younger, we suggest here that the name be retained. We also propose that the formation encompass the following informal lithologic units from Smitheman (1985) and Stewart et al. (2016) in the Stibnite area: 1) upper calc-silicate; 2) middle marble; and 3) quartzite of middle marble.

The middle quartzite sample (12DS16) possesses a unique shift in provenance, most notable in the multiple ~1700-2090 Ma peaks, that bear similarities to the upper Syringa metamorphic sequence (Wall Point and Smith Creek quartzites) and Cambrian Gold Creek Quartzite (Lakeview quartzite) deposits to the north (Lewis et al., 2010). The middle quartzite contains minor Grenvillian and Mesoproterozoic granite peaks and abundant ~1730, ~1800, and ~1830 Ma peaks. The pattern closely resembles those determined for samples of the Syringa sequence, minus the few mid-600 Ma grains, thought to be the continuation of the uppermost Windermere unit to the north of the study area (Lund et al, 2003; Lewis et al, 2010).

In contrast to the middle quartzite, the upper quartzite (sample 12DS14) possesses no analysis younger than ~1815 Ma, save for a two Grenvillian analyses, with major peaks at ~1840 Ma, 1920 Ma, a lesser one at ~2070 Ma and another notable one between ~2650-2750 Ma. This pattern of older ages bears strong resemblance to patterns found in the mid-Ordovician, Kinnikinic Quartzite in the Clayton area 100 km to the southeastern Idaho (Figure 3; Baar, 2009; Beranek, Link, and Fanning, 2016). Potential sources are likely from provinces to the north and northeast where a similar sequence of dates are found in the greater Priest River – Clearwater/Medicine Hat block and the Peace River Arch region, as well as the Great Falls Tectonic Zone, Rae-Hearn Province and the Trans-Hudson orogen to the northeast.

5.3. Rift Chronology

Neoproterozoic to Cambrian marine sedimentary rocks, glacial deposits, interbedded mafic volcanic rocks, and carbonates provide evidence for active extension and rifting along Laurentia's western margin (e.g., Bond et al., 1985; Lund, 2008; Yonkee et al., 2014). New data presented here illustrate that the deposits in the Edwardsburg – Stibnite area represent pre- to post-Rodinian rift sedimentation. DZ patterns presented here broadly correlate with a recent regional Neoproterozoic to Cambrian tectono-stratigraphic stage model put forth by Yonkee et al. (2014) (Figures 16 and 17). The following discussion generally compares the deposits in the Edwardsburg – Stibnite area to this stage model.

5.3.1. Pre-to-Stage 1 – basal siliciclastic package

Pre-Rodinian rift, Stage 1 strata are generally fluvial to shallow-marine type deposits that range in maturity, and possess dominant Grenville DZ signatures with relatively minor older influences and rare 760-740 Ma grains (Yonkee et al., 2014). The Square Mountain Formation samples (10RL775 and 10RL774) may predate or represent very early Stage 1 strata. Neither Square Mountain sample yielded significant Grenville-aged or younger analyses, despite being relatively mature samples. While the ~1330 Ma maximum depositional age does not preclude the samples from being younger, the lack of a Grenville signature with a A-type granite signature indicates the Square Mountain

Formation may predate the fully developed transcontinental river system of the Uinta Mountain Group (Dehler et al., 2010) and be a previously unrecognized stratigraphic interval or to have originated from a conjugate margin that is no longer present.

5.3.2. Stage 2 – early rift, diamictite-bearing and volcanic package

Stage 2 strata are subdivided into three general categories that record early rifting through the onset of regional subsidence from ~720-660 Ma (Yonkee et al., 2014), and thus comprise a range of lithologies. Early stage 2 patterns generally lack young grains related to felsic volcanism and are typically dominated by Grenville dates. Syn-rift patterns typically contain young (~700-670 Ma) grains followed by variable influences from Grenville through Yavapai-Mazatzal material, and a relatively large late Archean signal; later stage 2 patterns typically lack young grains, and are usually dominated by Grenville to Yavapai-Mazatzal dates with variable Archean influences. Within the Edwardsburg Formation, the DZ pattern from the lower Wind River Meadows quartzite (BC14-01) compares well with both stage 1 and early stage 2 patterns and may represent a transition between the two stages. The two matrix-supported diamictite samples (BC14-01 and BC14-02) do resemble syn-rift stage 2 patterns, although young grains are very sparse.

The solely Archean DZ pattern from the Golden Cup Member (BC14-04) of the Edwardsburg Formation, while problematic, is not entirely unique for the region. A few regional samples, including the greywacke member of the Dutch Peak Formation in the Sheeprock Mountains section in north-central Utah, also display similar, dominantly Archean DZ patterns later in stage 2 (Yonkee et al, 2014). The diamictite sample from the Placer Creek Member (BC14-05) is more difficult to place into context. The sample is dominated by a Yavapai DZ signal, with a lesser A-type granite peak, but lacks the predicted Grenville or younger peak. While this pattern does strongly resemble the mid-stage 2, Trout Creek sample (41PL09) of Yonkee et al. (2014), it does not generally correlate well with other later stage 2 patterns. The pattern most closely resembles that of the underlying Square Mountain Formation (10RL774) and may simply represent reworking from local uplifted strata. The presence of amphibolite clasts likely derived from the underlying unit, and the mafic composition of the matrix also supports local contributions.

5.3.3. Stage 3 – post-rift, early extension, mature siliciclastic package

Stage 3 strata generally reflect early extensional deposition following rifting and broad thermal subsidence from ~660-580 Ma (Yonkee et al, 2014). Post-Rodinian rift, Stage 2 strata are generally mature with variable amounts of Grenville to Yavapai-Mazatzal DZ patterns and rare young grains. The Moores Station Formation (10RL878) is included in this stage as it overlies the diamictite and volcanic-bearing Edwardsburg Formation, and possesses a ~30 My younger maximum depositional age (~653 Ma). Incorporation of these young ~650-660 Ma grains requires rift-related exhumation of regional shallow plutons during late Stage 2. There must also be a significant unconformity and hiatus between the top of the Edwardsburg Formation (~685 Ma Hogback Rhyolite) and the overlying Moores Station Formation.

In the Stibnite area, the overlying quartzite of Profile Creek (10RL893), quartzite and schist (14RL011a), and quartz pebble conglomerate unit possess patterns in accordance with other regional stage 2-3 deposits to the south (e.g., Sheeprock-San Francisco, Perry Canyon-Fremont Island, Pocatello-Oxford Mountain, and Deep Creek areas); characterized by subequal Greneville and A-type granite, and subordinate Yavapai-Mazatzal signals. The progressive transition toward an increasingly older provenance up section may mark the transition to renewed rifting in stage 4.

5.3.4. Stage 4 – later rifting, transition to drift

Stage 4 strata generally record a transition from distally sourced provenances to more localized as rifting is renewed from ~570-540 Ma before the transition to drift (Yonkee et al., 2014). Stage 4 patterns vary by location, but are generally dominated by A-type granite and Yavapai-Mazatzal signals with little to no Grenville or younger influences, having been cut off during thermal uplift. The lower quartzite samples (12DS24, 12DS19, and 10RL888) are similarly patterned as relatively local Yavapai-Mojave age grains dominate them with rare to no younger influence.

5.3.5. Stage 5 – thermal subsidence, passive margin sedimentation

Carbonate-rich, with lesser siliciclastic, stage 5 strata are likely the result of an overall sea level rise during the Sauk transgressive sequence (Bush, Thomas, and Pope, 2012). Stage 5 patterns display a dominant late-Cambrian peak and a shift to much older material in the Middle Ordovician (Yonkee et al., 2014). Late Cambrian patterns are dominated by ~500 Ma grains, likely sourced from shallow intrusions or volcanic material derived from the Lemhi arch, with subordinate Yavapai-Mazatzal peaks and few older grains. Patterns from the quartzite within middle marble (14DS12 and 12DS33) possess similar, ~500 Ma age spectra that compare well with late Cambrian, stage 5 deposits of Yonkee et al. (2014).

Later stage 5, Middle Ordovician DZ spectra are mostly composed of 2100-1800 Ma age grains, likely from the greater Trans-Hudson area, and generally lack younger grains (Yonkee et al., 2014). DZ pattern from the middle quartzite (12DS16) appears intermediate between late Cambrian and Middle Ordovician patterns, with the same ~1700 Ma peak as seen in late Cambrian quartzites, but disappearance of the prominent ~500 Ma population. This sample thus may represent an Early Ordovician(?) transitional depositional phase. The pattern within the upper quartzite (12DS14) however, can be clearly correlated with similar middle Ordovician stage 5 spectra, with a northerly to northeasterly influence as evidenced by a ~2070 Ma peak sourced from the Peace River arch region in Canada.

6. Conclusions

Data from roof pendants in the Edwardsburg-Stibnite area better constrain the Neoproterozoic stratigraphic framework established by Lund et al. (2003; 2010) and provide the first geochronologic evidence of Cambrian and Ordovician strata in this part of central Idaho. Our results confirm speculation by early workers (Currier, 1935; Shenon and Ross, 1936; and White, 1941) that some of the strata near Stibnite are Paleozoic, and requires re-assignment of the Missouri Ridge Formation to the Cambrian and possible Early Ordovician.

Detrital zircon data presented here document the prolonged evolution and changing sediment sources, from pre-to-post Rodinian rifting and basin-subsidence, of the western Laurentian margin. Additionally, this time period is thought to include panglacial episodes as part of the ‘Snowball Earth’ hypothesis; thus a highly accurate depositional age model is needed. However, the great majority of the zircons from samples analyzed in this study are hundreds of million years older than their respective ages of deposition. The relatively small number of available young zircons, combined with limited precision inherent to the LA-ICPMS system, restricts creation of robust depositional timelines. These new data highlight the need for a tandem approach of *in situ* and high-precision CA-IDTIMS analytic techniques to identify and accurately date small zircon populations from Neoproterozoic strata.

Low in the Edwardsburg Formation, the CA-IDTIMS ~692 and ~693 Ma maximum depositional ages for the Wind River Meadows Member clearly places the units within the early Cryogenian (Sturtian) Period. The ~653 Ma age determined for the overlying Moores Station Formation post-dates the ~717-660 Ma Sturtian timeframe. Additionally, this ~653 Ma date likely records rift-related sedimentation from uplifted ~650 Ma plutonic rocks (Lund et al., 2010), indicating a significant unconformity between the top of the ~685 Ma Edwardsburg Formation (Lund et al., 2003) and the Moores Station Formation.

Similarly, young ~668 Ma and 667 Ma CA-IDTIMS results low in the Stibnite area are also likely sourced from exhumed, local ~665 Ma plutons (Lund et al., 2010). Up section, robust ~503 maximum depositional ages place the ‘quartzite of middle marble’ as clearly Late Cambrian, and possibly as Early Ordovician in age.

The non-systematic shifting of DZ patterns up section highlights the complex sourcing and depositional environments of these deposits. Shifting ages and patterns may be due to some unroofing and mixing of proximal sources, but most variation likely reflects major sedimentation changes in source areas over time related to diachronous Rodinian rifting. This variability in DZ patterns highlights the need for significant number of samples, at least for strata of this time period and place, to fully characterize a section. The results presented here generally compare with Neoproterozoic to Cambrian rocks in Utah, Nevada, and Idaho (Yonkee et al., 2014), and are interpreted to record: 1 – pre-rift, intracratonic basin deposition; 2 – early rifting and volcanism; 3 – post-rift and early subsidence; 4 – renewed rifting and transition to drift; and 5 – regional subsidence and passive margin sedimentation.

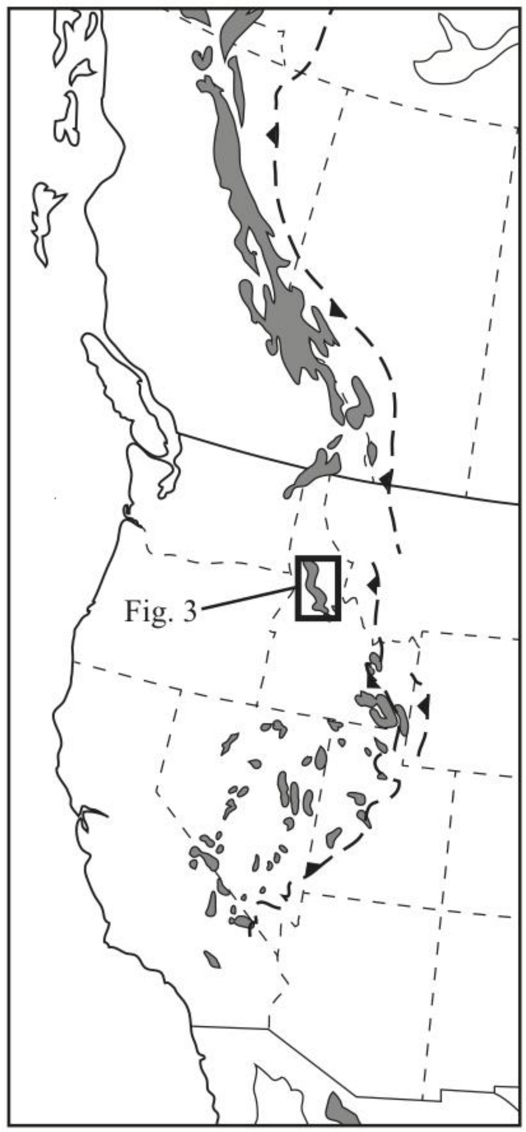

Figure 1.1: Map of Windermere Supergroup and equivalent deposits (gray) along the North American and Canadian Cordillera, modified from Lund et al. (2003). Inset box showing general area of study, refers to Figure 3.

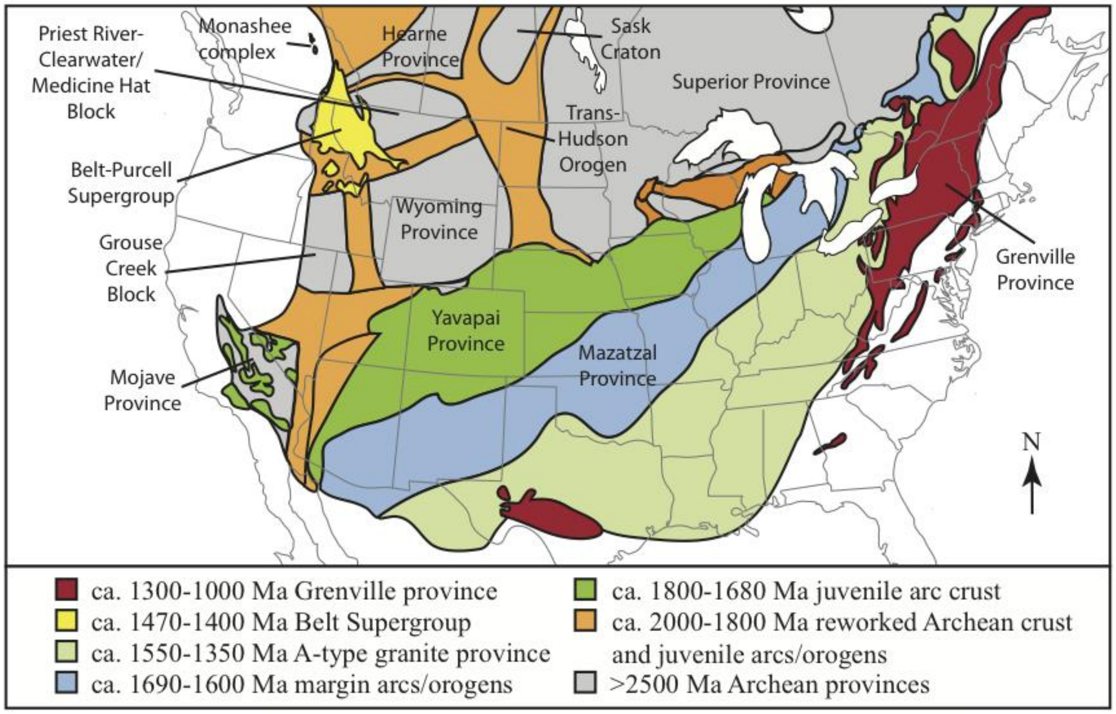

Figure 1.2: Generalized map of Precambrian basement rocks of Laurentia, modified from Whitmeyer and Karlstrom (2007); Gaschnig et al. (2012); Vervoort et al. (2016).

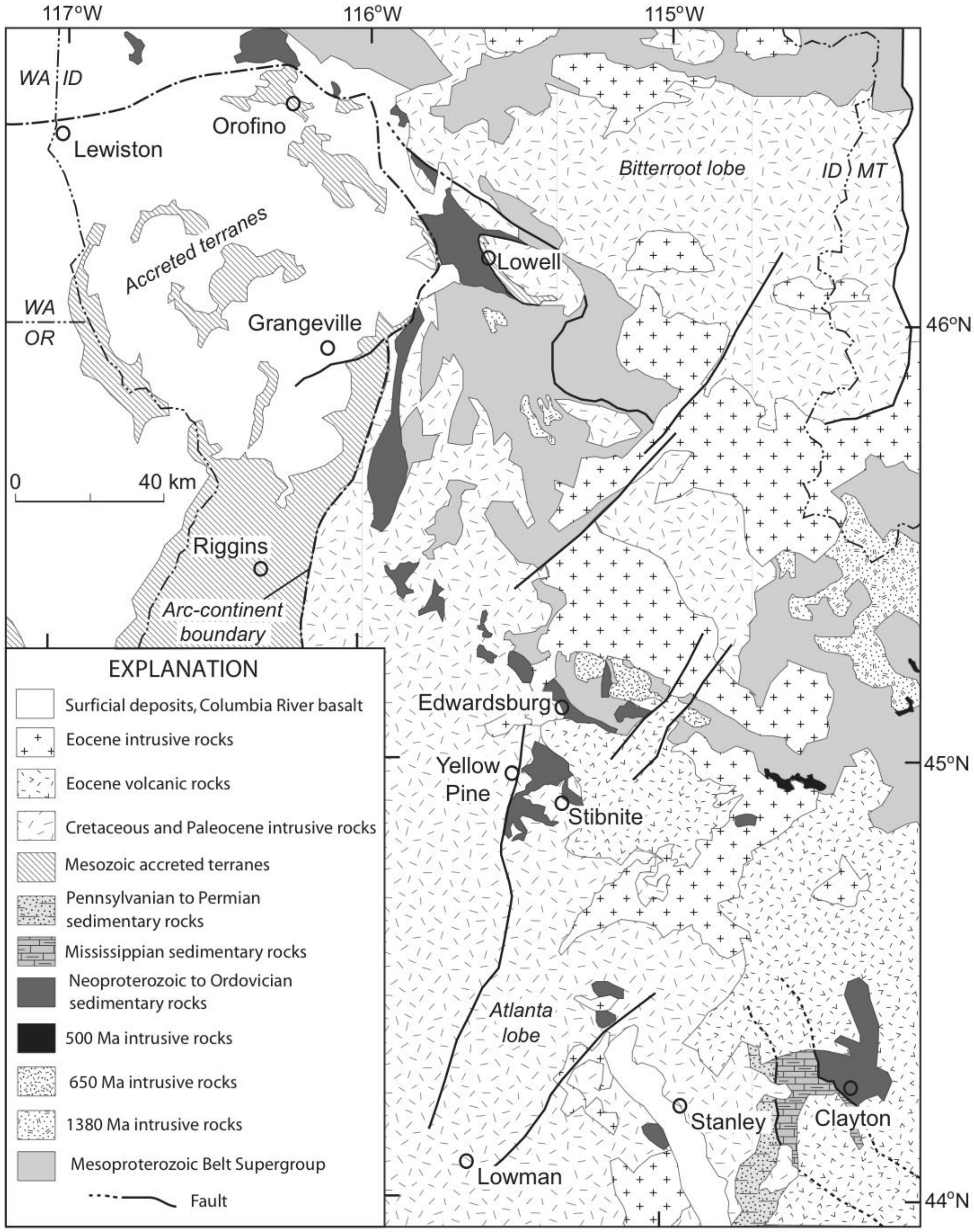

Figure 1.3: Simplified geologic map of central Idaho showing locations for roof pendants of Neoproterozoic to Ordovician sedimentary rocks forming a northwest trending belt across central Idaho. Units analyzed in this study are located near the Edwardsburg and Stibnite areas, as noted on ensuing Figures 5 and 6.

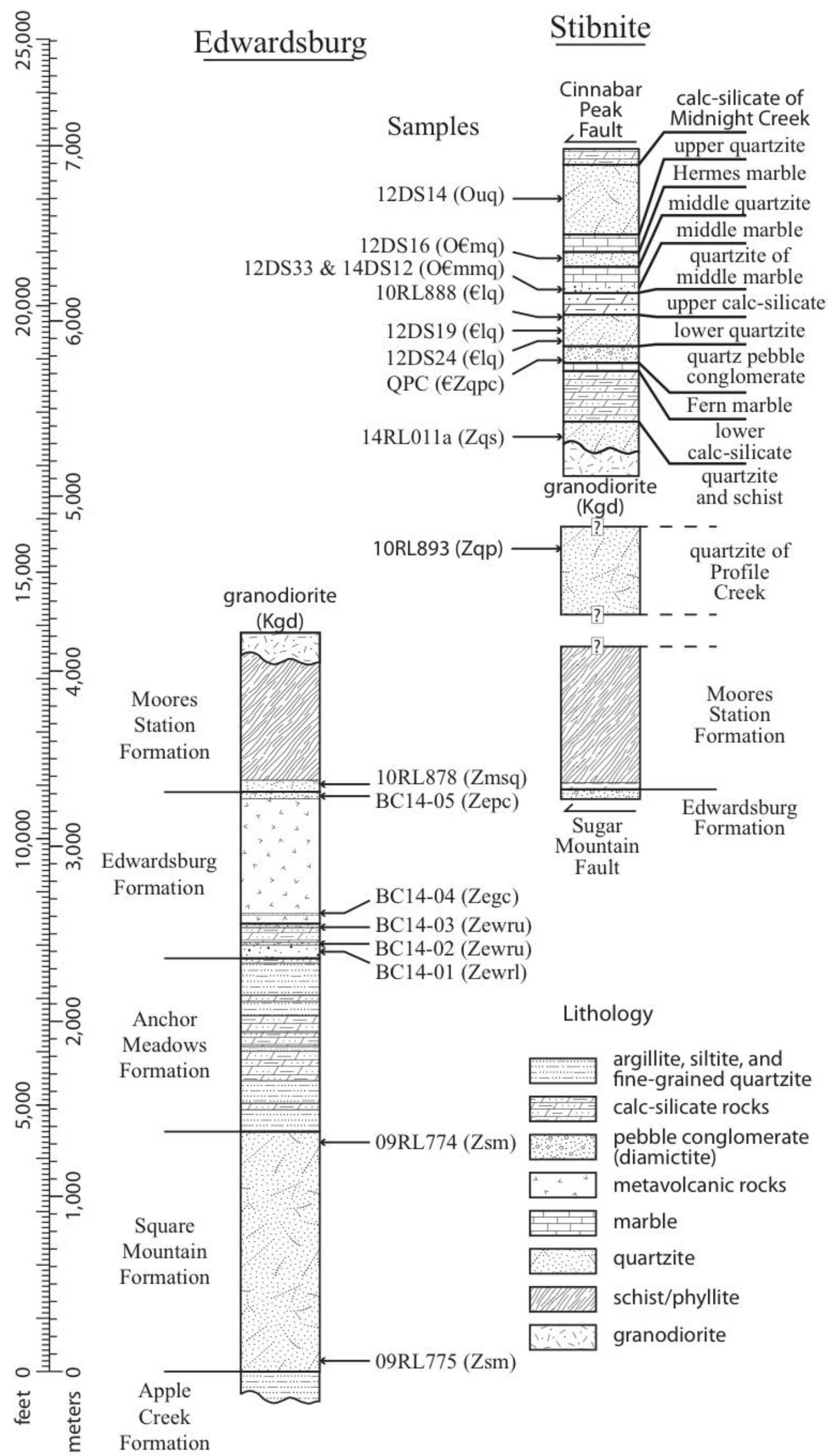

Figure 1.4: Composite stratigraphic sections for Neoproterozoic to Cambrian strata of the Edwardsburg and Stibnite areas after Lewis et al. (2012); Stewart et al. (2016).

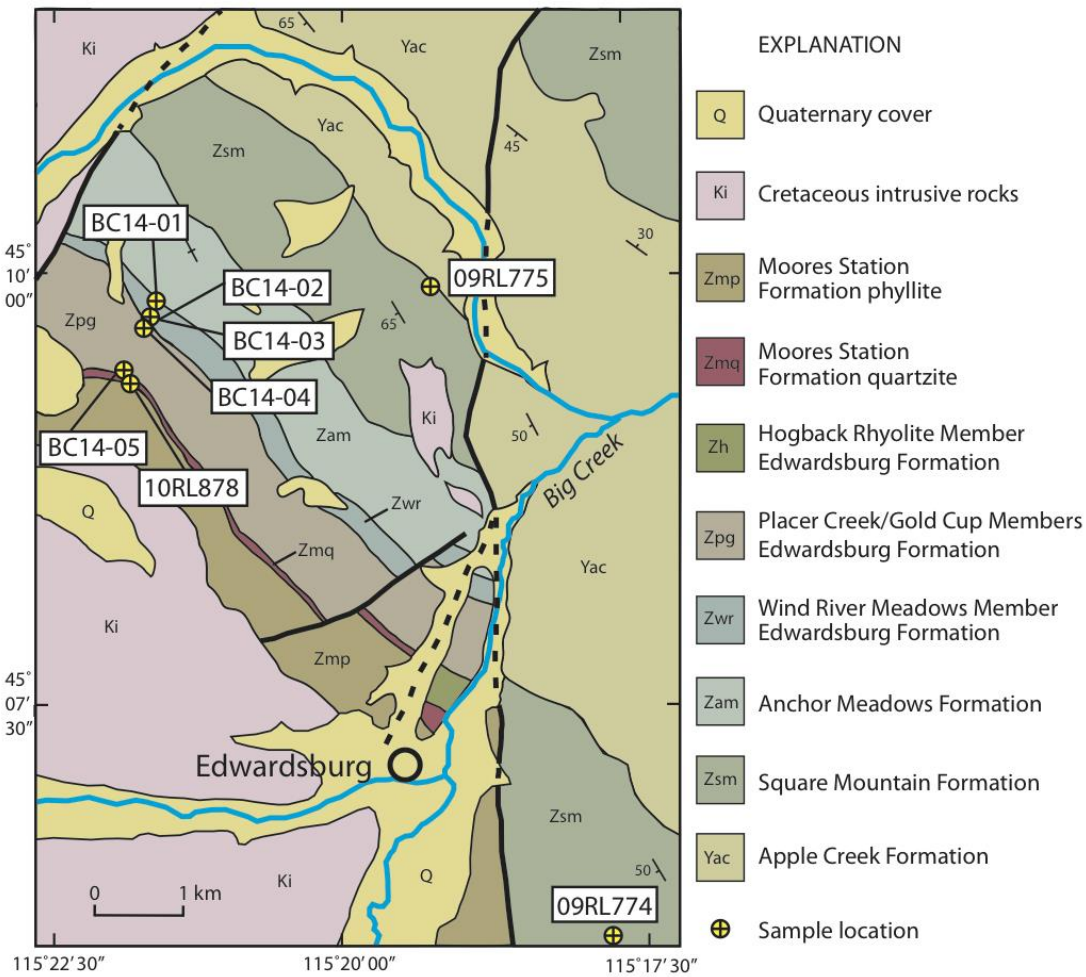

Figure 1.5: Simplified geologic map of the Edwardsburg area, central Idaho (modified from Lewis et al., 2012), showing approximate locations of dated samples.

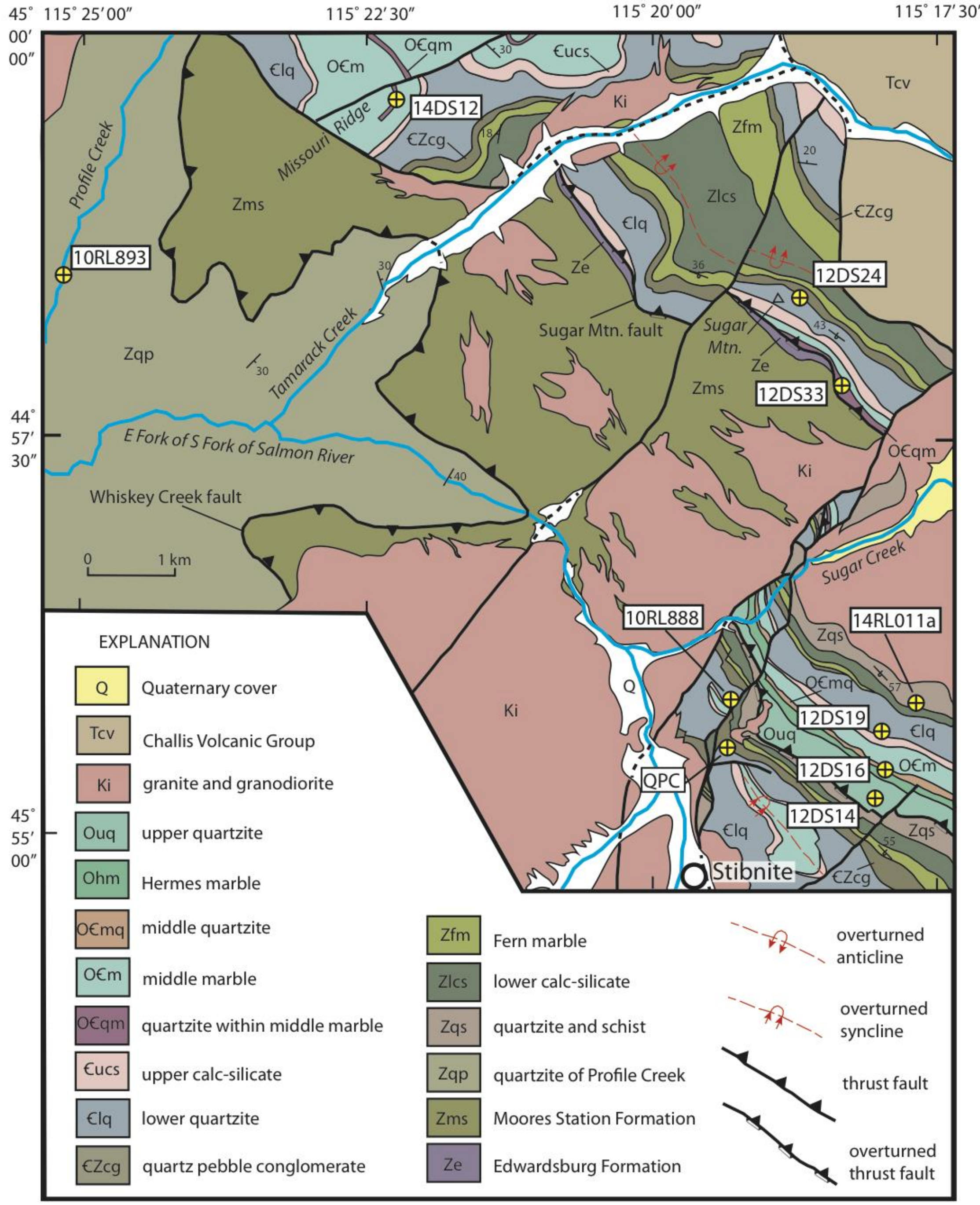

Figure 1.6: Simplified geologic map of the Stibnite area, central Idaho (modified from Stewart et al., 2016), showing approximate locations of dated samples.

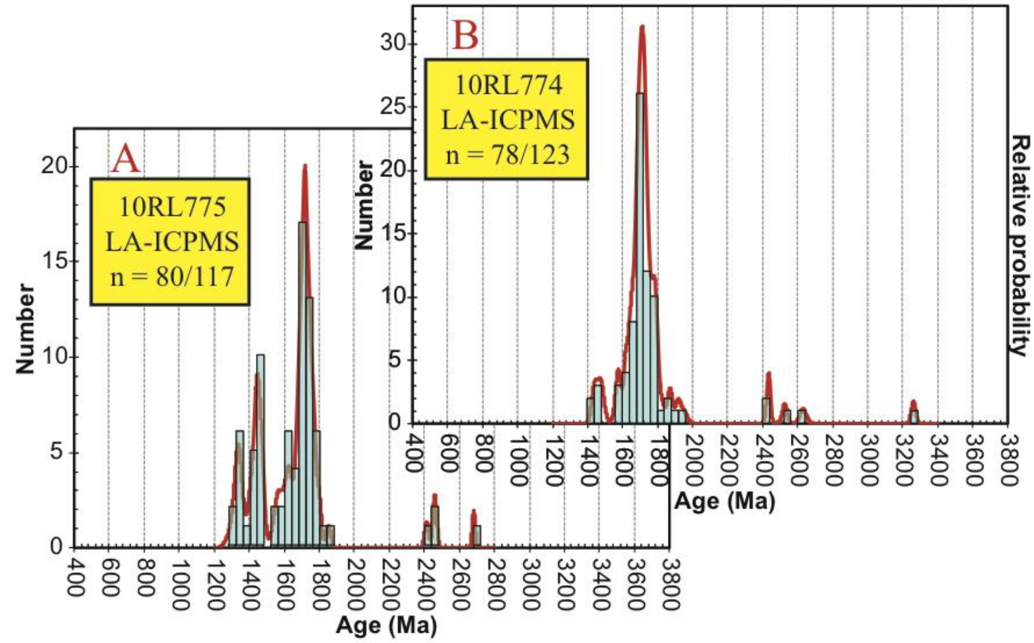

Figure 1.7: Relative probability plots of LA-ICPMS results from Square Mountain Formation samples showing $^{207}Pb/^{206}Pb$ zircon calculated dates, using ≤10% discordant analyses only. Yellow boxes show number of ≤10% discordant/total number analyses. A: LA-ICPMS results from Square Mountain quartzite (10RL775) B: LA-ICPMS results from Square Mountain quartzite (10RL774).

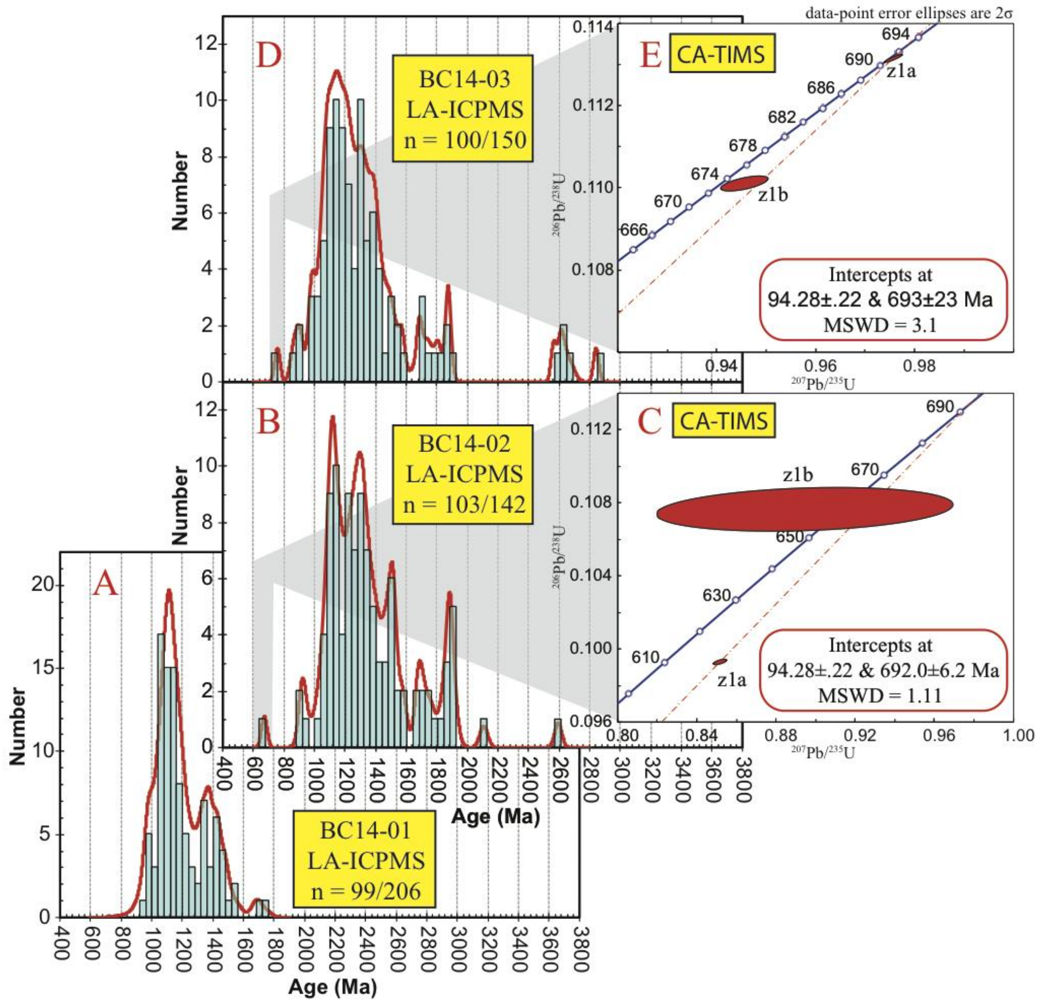

Figure 1.8: Relative probability and Wetherill concordia plots of LA-ICPMS and CA-TIMS results from Wind River Meadows Member samples. Probability plots show $^{206}Pb/^{238}U$ < 1000 Ma < $^{207}Pb/^{206}Pb$ zircon calculated dates, using ≤10% discordant analyses only. Yellow boxes show number of ≤10% discordant/total number analyses. Grey shadow illustrates LA-ICPMS population plucked for subsequent CA-TIMS analysis. CA-TIMS upper intercept ages are anchored at 94.28 ±0.22 Ma as discussed in text. A: Lower Wind River Meadows quartzite (BC14-01), B: Wind River Meadows diamictite (BC14-02), C: CA-TIMS upper-intercept date of ~693 Ma from single youngest (~672 Ma) grain split in two pieces, D: Relatively siliceous, matrix-supported Wind River Meadows diamictite (BC14-03), E: CA-TIMS upper-intercept date of ~694 Ma from youngest (~755 Ma) single grain, split into two pieces.

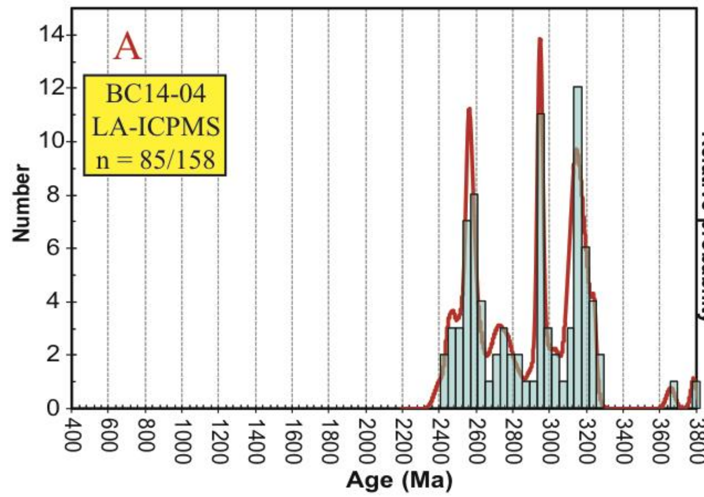

Figure 1.9: Relative probability plot of LA-ICPMS results showing $^{207}Pb/^{206}Pb$ zircon calculated dates, for ≤10% discordant analyses only. Yellow box shows number of ≤10% discordant/total number analysis. A: LA-ICPMS results of a calc-silicate quartzite from the lower-most portion of the Golden Cup Member (BC14-04).

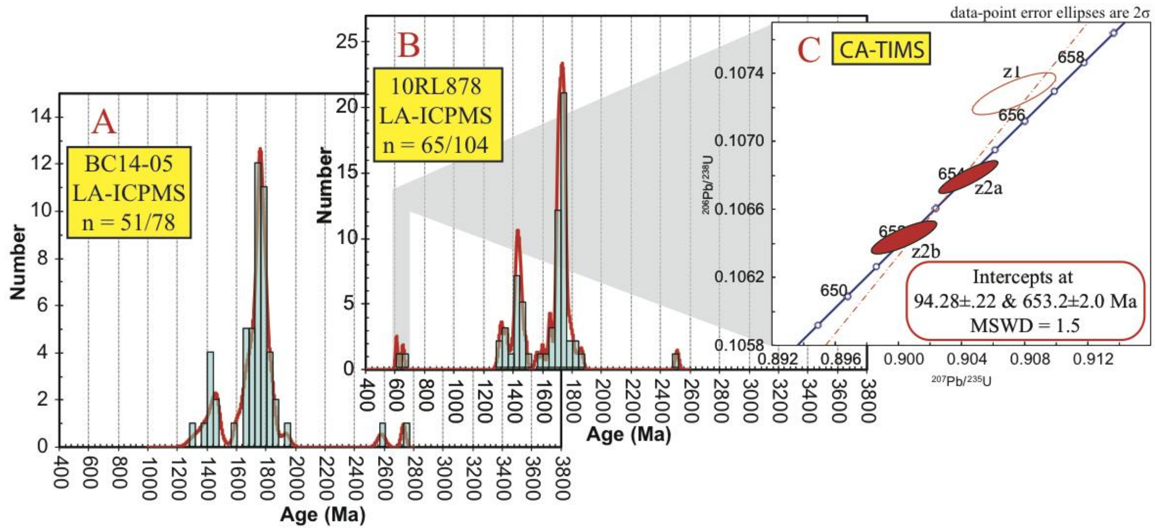

Figure 1.10: Relative probability and Wetherill concordia plots of LA-ICPMS and CA-TIMS results from Placer Creek Member and Moores Station Formation samples. Probability plots show $^{206}Pb/^{238}U$ < 1.0 Ga < $^{207}Pb/^{206}Pb$ zircon calculated dates, using ≤10% discordant analyses only. Grey shadow illustrates LA-ICPMS population plucked for subsequent CA-TIMS analysis. CA-TIMS plots show upper intercept ages anchored at 94.28 ±0.22 Ma as discussed in text. Yellow boxes show number of ≤10% discordant/total number analyses. A: Relatively clast-rich, diamictite from the Placer Creek Member (14BC-05), B: Moores Station Formation quartzite (10RL878), C: CA-TIMS upper-intercept date of ~653 Ma from youngest single grain split in two pieces; second young grain yielded reversely discordant dates (open circle and not shown) that are not utilized.

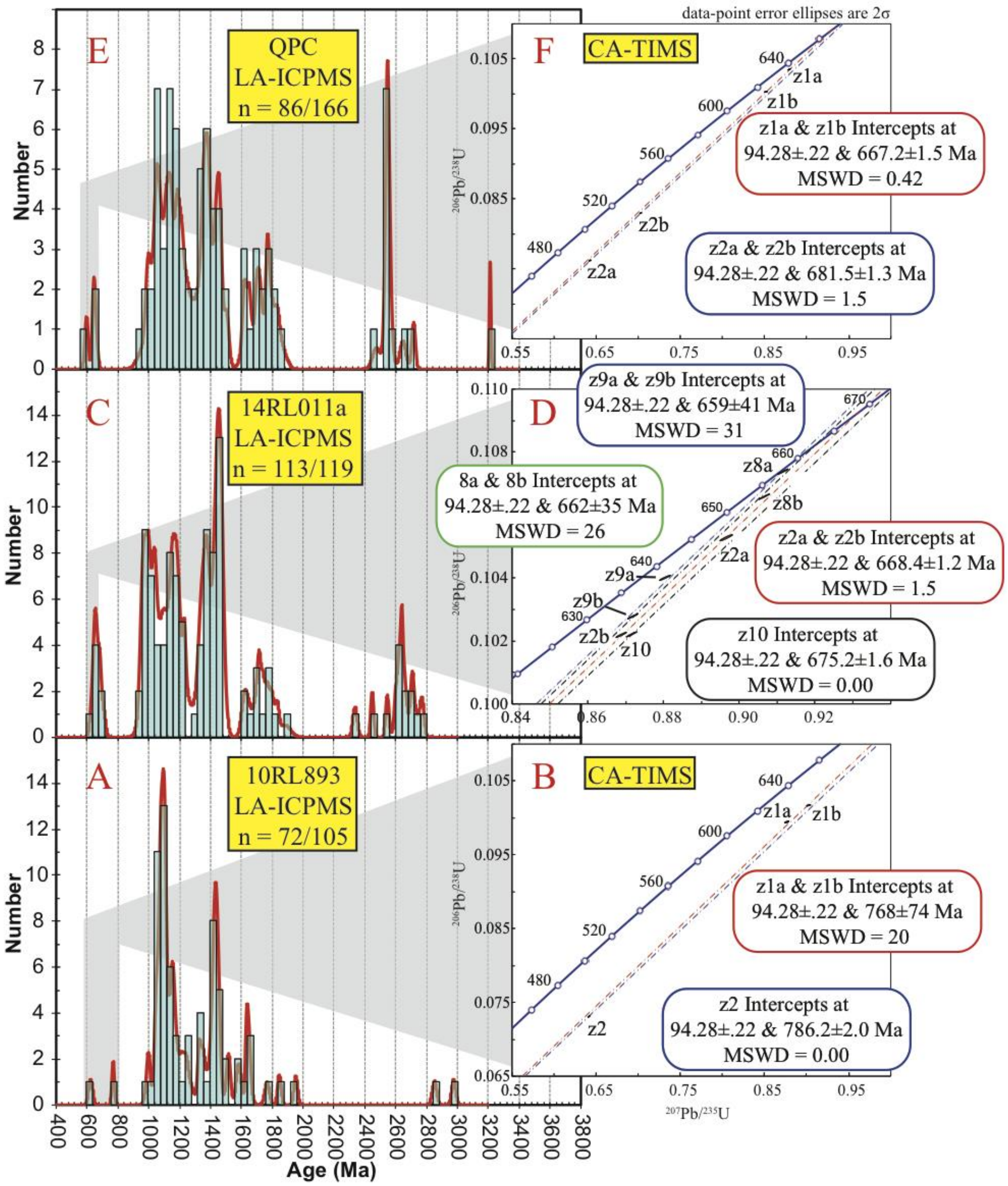

Figure 1.11: Relative probability and Wetherill concordia plots of LA-ICPMS and CA-TIMS results from the lower section in the Stibnite area. Probability plots show $^{206}Pb/^{238}U$ < 1.0 Ga < $^{207}Pb/^{206}Pb$ zircon calculated dates, using ≤10% discordant analyses only. Grey shadow illustrates LA-ICPMS population plucked for subsequent CA-TIMS analysis. CA-TIMS plots show upper intercept ages anchored at 94.28 ± 0.22 Ma as discussed in text. Yellow boxes show number of ≤10% discordant/total number analyses. A: Quartzite of Profile Creek (10RL893), B: CA-TIMS results from two youngest grains from the quartzite of Profile Creek showing upper intercept ages of ~768 Ma from a split grain and ~786 Ma from a whole grain. C: Quartzite sample (14RL011a) from the quartzite and schist unit, D: CA-TIMS results from four youngest grains (three split and one whole), yielding a most confident upper intercept age of ~668 Ma (z2a & z2b), E: Quartz pebble conglomerate (QPC) sample, F: CA-

TIMS results from two youngest grains (third was lost) yields a most confident upper intercept date of ~667 Ma.

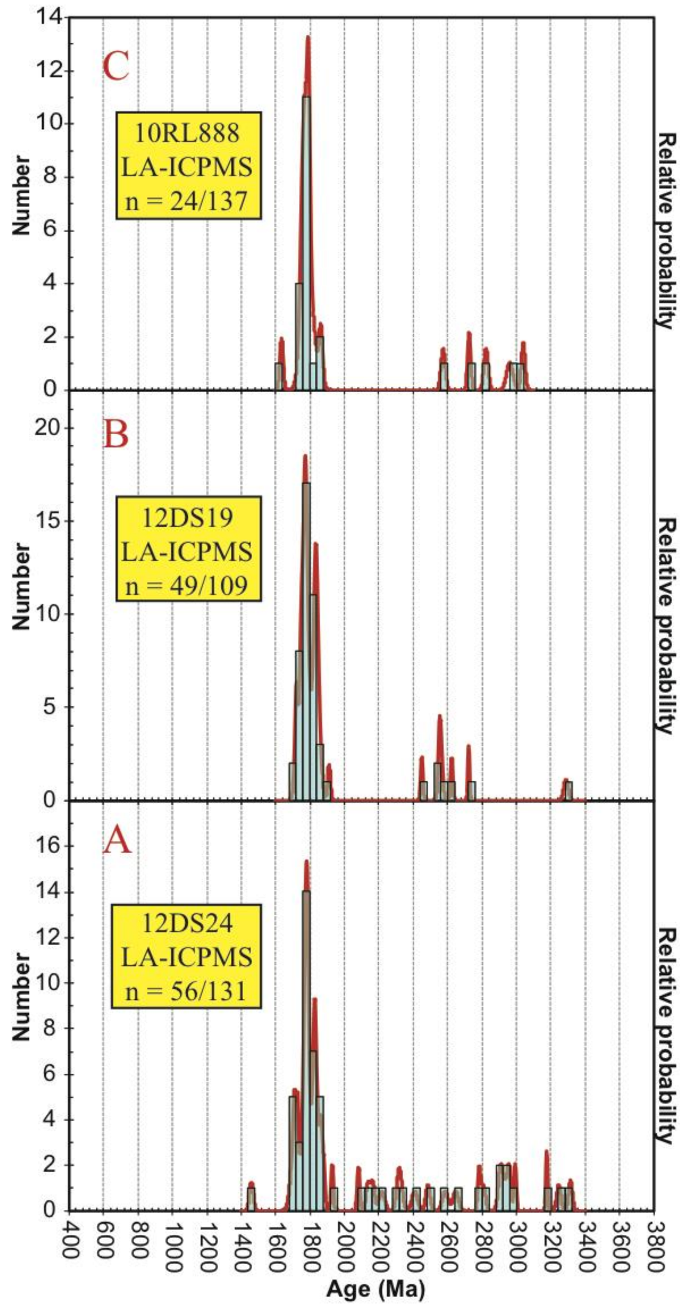

Figure 1.12: Relative probability plots of LA-ICPMS results from the lower quartzite in the Stibnite area. Relative probability plots show $^{207}Pb/^{206}Pb$ zircon calculated dates, using ≤10% discordant analyses only. Yellow boxes show number of ≤10% discordant/total number analyses. A: Sample 10RL893, B: Sample 12DS19, C: Sample

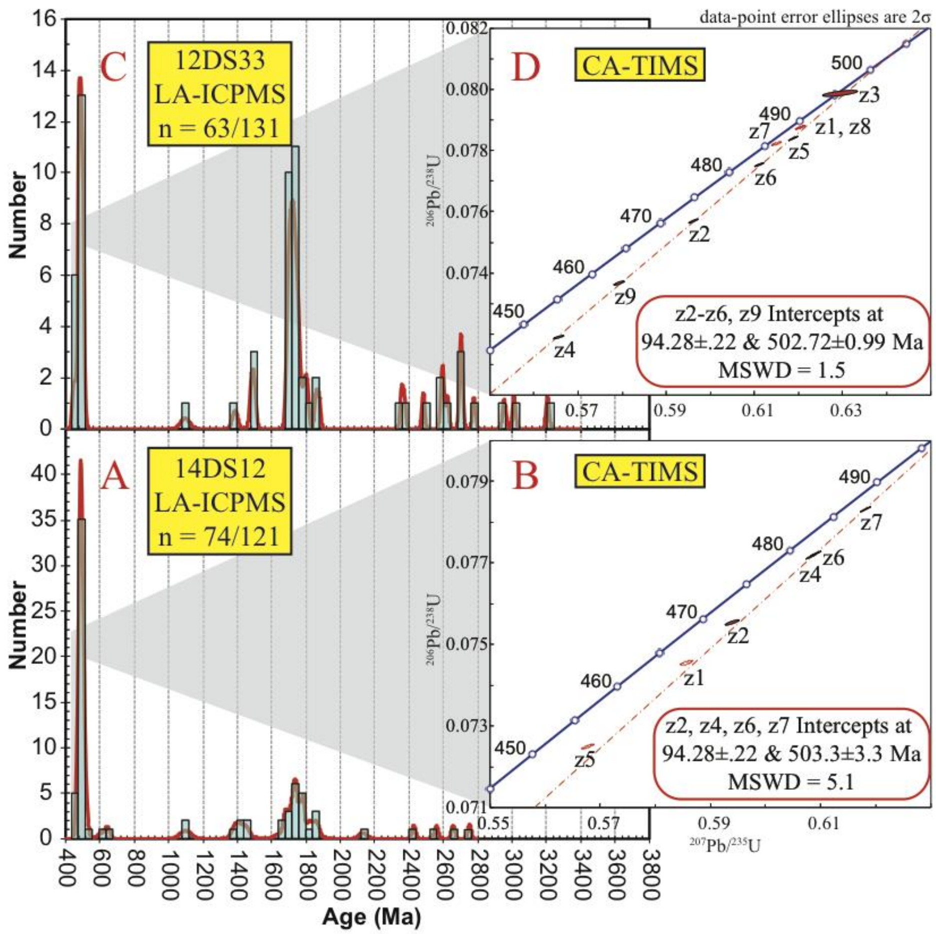

Figure 1.13: Relative probability and Wetherill concordia plots of LA-ICPMS and CA-TIMS results from the quartzite within middle marble. Probability density plots show $^{206}Pb/^{238}U$ < 1.0 Ga < $^{207}Pb/^{206}Pb$ zircon calculated dates, using ≤10% discordant analyses only. Grey shadow illustrates LA-ICPMS population plucked for subsequent CA-TIMS analysis. CA-TIMS plots show upper intercept ages anchored at 94.28 ±0.22 Ma as discussed in text. Yellow boxes show number of ≤10% discordant/total number analyses. A: Quartzite sample (14DS12), B: CA-TIMS results from seven while grains from the youngest LA-ICPMS peak, yielding an upper intercept at ~503 Ma from 4 of 7 analysis. C: Quartzite sample (12DS33), D: CA-TIMS results from nine whole grains from the youngest LA-ICPMS peak, yielding an equivalent upper intercept date of ~503 Ma from 6 of 9 analysis.

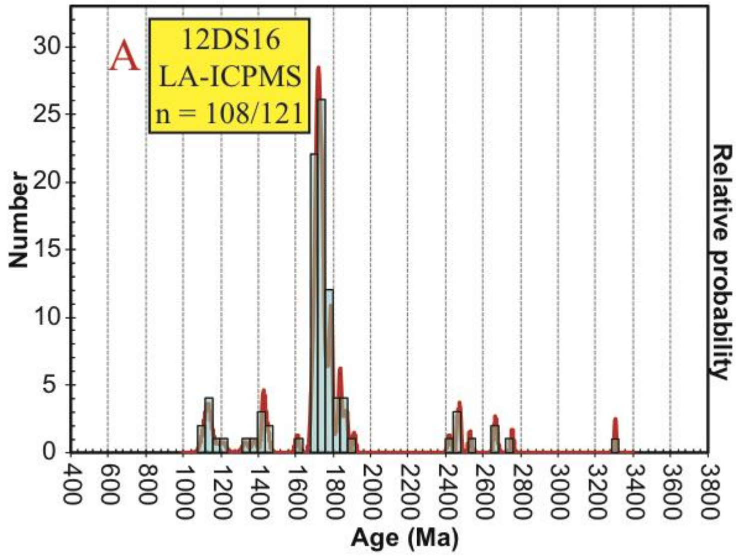

Figure 1.14: A: Relative probability plots of LA-ICPMS results from the middle quartzite (12DS16), in the Stibnite area, showing $^{207}Pb/^{206}Pb$ zircon calculated dates, using ≤10% discordant analyses only. Yellow box shows number of ≤10% discordant/total number analyses.

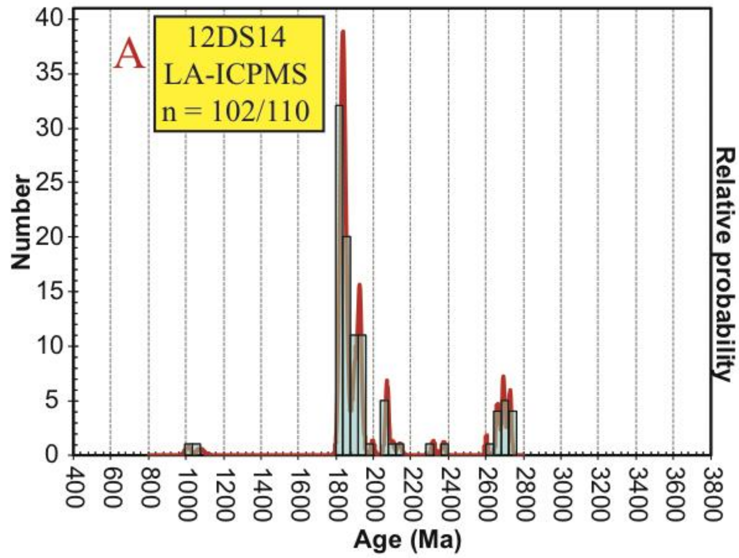

Figure 1.15: A: Relative probability plots of LA-ICPMS results from the upper quartzite (sample 12DS14), in the Stibnite area, showing $^{207}Pb/^{206}Pb$ zircon calculated dates, using ≤10% discordant analyses only. Yellow box shows number of ≤10% discordant/total number analyses.

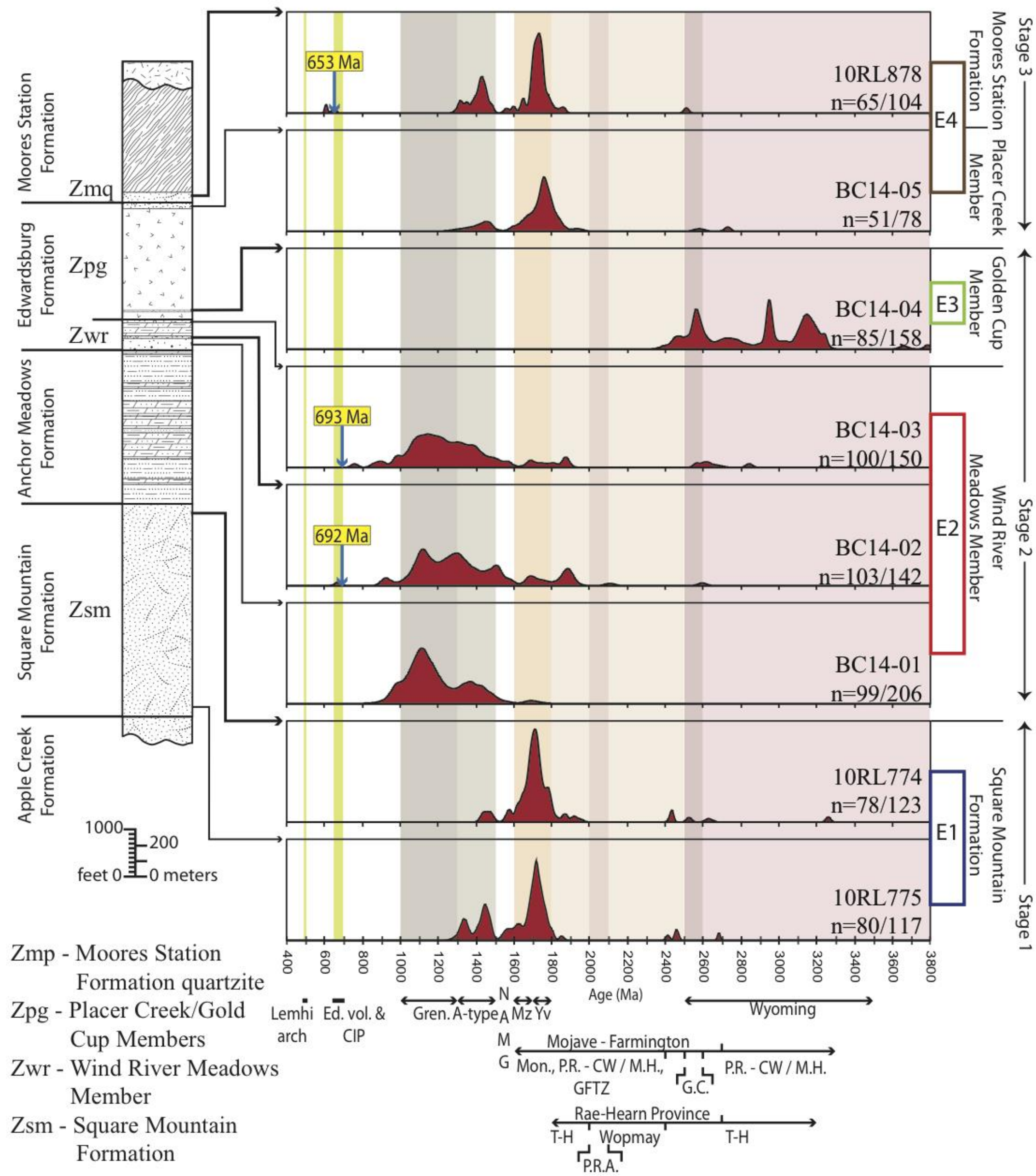

Figure 1.16: Edwardsburg area - Main body – Stacked relative probability plots of detrital zircon spectra (≤10% discordant LA-ICPMS analyses only) from sampled stratigraphy (left column). Sample name, number, and number of ≤10% discordant analysis/total analysis listed on right side of stacked plots. Yellow boxes on left represent most confident CA-TIMS dates determined from youngest LA-ICPMS populations. Right column – Samples are qualitatively divided into groups (E1-E4), based on DZ patterns that highlight dominant provenance changes correlated with tectono-stratigraphic stage model of Yonkee et al. (2014) as discussed in text. Bottom

– expected ages from sediment sources, as generally shown in Figure 2, are: Wyoming province, ~2500-3500+ Ma (e.g., Mogk, et al., 1992; Frost et al., 1998; Chamberlain et al., 2003; Mueller et al., 2004; Frost et al., 2006a; Frost et al., 2006b); Farmington complex, 1600-2700 Ma (Mueller et al., 2011; Nelson et al., 2011); Grouse Creek block (G.C.), 2500-2600 Ma (Strickland et al., 2011; Isakson, 2012); greater Monashee complex (Mon.), Priest River (P.R.) – Clearwater (CW) / Medicine Hat block (M.H.), and Great Falls tectonic zone (GFTZ) include 1600-2400, 1840-1880, and 2600-3300 Ma (e.g., Ross and Bowring, 1991; Villeneuve et al., 1993; Doughty et al., 1998; Crowley, 1999; Mueller et al., 2002; Foster et al., 2006; Vervoort et al., 2015); Rae-Hearn province and Trans-Hudson orogen (T-H) 1800-2700, 1800-2000, and 2400-3200 Ma (e.g., Hoffman, 1988; Bickford et al., 1990; Ansdell et al., 1995; Hollings and Ansdell, 2002; Ross and Villeneuve, 2003; St-Onge et al., 2007; Whitmeyer and Karlstrom, 2007); Wopmay orogen, 2000-2400 Ma (Bowring and Podosek, 1989; Roll, 2002); Peace River Arch (P.R.A.), 2000-2100 Ma; Mojave and Yavapai-Mazatzal provinces (Yv and Mz), ~1700-2700 and 1600-1800 Ma (Bickford et al., 2008; Shufeldt et al., 2010; Strickland et al., 2013); North American magmatic gap (NAMG), ~1490-1610 Ma (Ross et al., 1992); A-type granitic province, 1300- 1500 Ma (Bickford et al., 1986; Evans and Zartman, 1990; Doughty and Chamberlain, 1996); Grenville province (Gren.), ~1000-1300 Ma (e.g., Eriksson et al., 2003; Grower and Krogh, 2001; McLelland et al., 2001); Edwardsburg volcanics (Ed. vol.) and central Idaho plutons (CIP), ~650-685 Ma (Lund et al., 2003; 2010); and Lemhi arch 485-500 Ma (Lund et al., 2010).

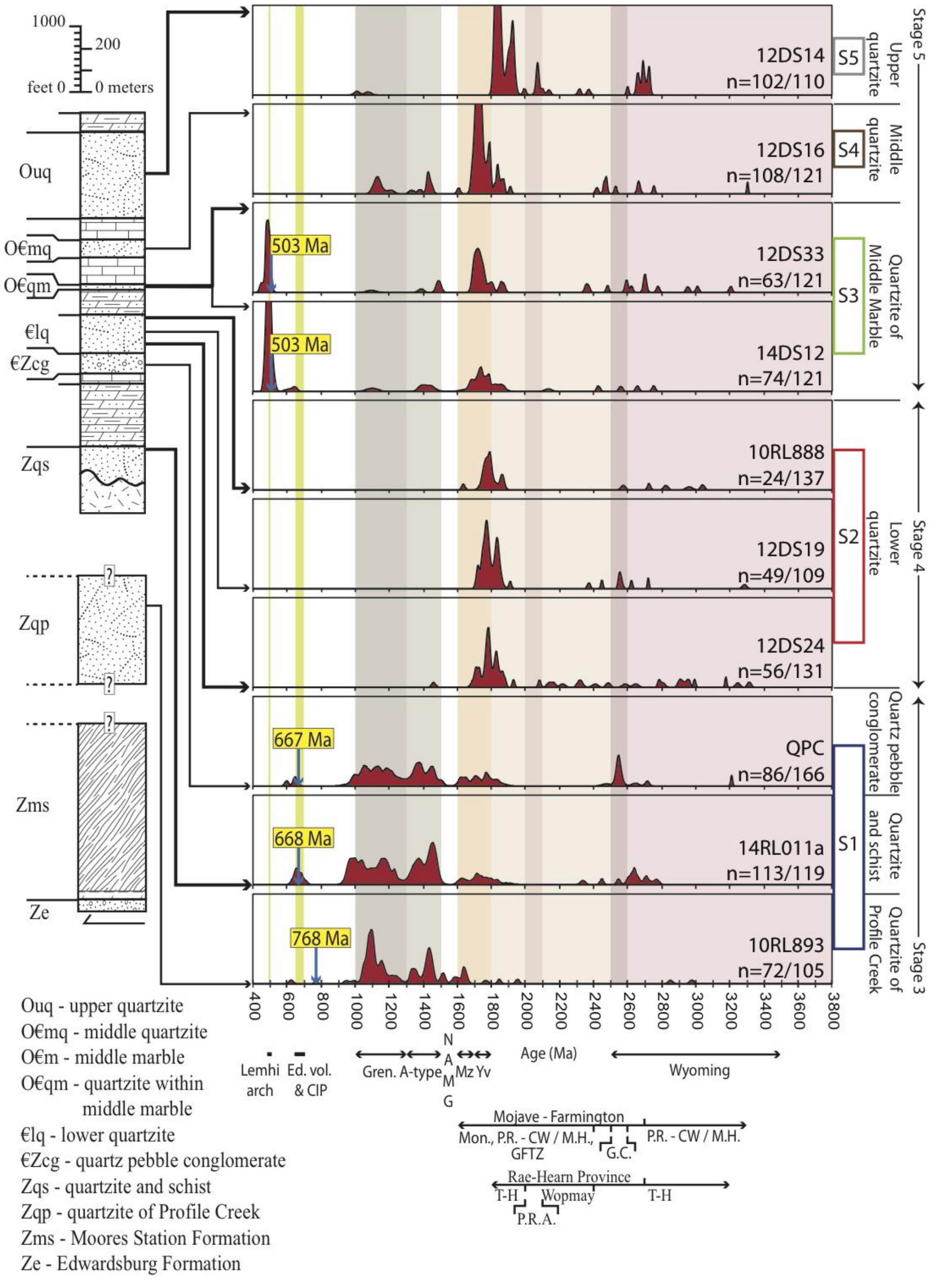

Figure 1.17: Stibnite area - Main body – Stacked relative probability plots of detrital zircon spectra (≤10% discordant LA-ICPMS analyses only) from sampled stratigraphy (left column). Sample name, number and number of ≤10% discordant analysis/total analysis listed on right side of stacked plots. Yellow boxes on left represent most confident CA-TIMS dates determined from youngest LA-ICPMS populations. Right column – Samples are qualitatively divided into groups (S1-S5),

based on DZ patterns that highlight dominant provenance changes correlated with tectono-stratigraphic stage model of Yonkee et al. (2014) as discussed in text. Bottom – expected ages from sediment sources, as generally shown in Figure 2, are: Wyoming province, ~2500-3500+ Ma (e.g., Mogk, et al., 1992; Frost et al., 1998; Chamberlain et al., 2003; Mueller et al., 2004; Frost et al., 2006a; Frost et al., 2006b); Farmington complex, 1600-2700 Ma (Mueller et al., 2011; Nelson et al., 2011); Grouse Creek block (G.C.), 2500-2600 Ma (Strickland et al., 2011; Isakson, 2012); greater Monashee complex (Mon.), Priest River (P.R.) – Clearwater (CW) / Medicine Hat block (M.H.), and Great Falls tectonic zone (GFTZ) include 1600-2400, 1840-1880, and 2600-3300 Ma (e.g., Ross and Bowring, 1991; Villeneuve et al., 1993; Doughty et al., 1998; Crowley, 1999; Mueller et al., 2002; Foster et al., 2006; Vervoort et al., 2015); Rae-Hearn province and Trans-Hudson orogen (T- H) 1800-2700, 1800-2000, and 2400-3200 Ma (e.g., Hoffman, 1988; Bickford et al., 1990; Ansdell et al., 1995; Hollings and Ansdell, 2002; Ross and Villeneuve, 2003; St-Onge et al., 2007; Whitmeyer and Karlstrom, 2007); Wopmay orogen, 2000-2400 Ma (Bowring and Podosek, 1989; Roll, 2002); Peace River Arch (P.R.A.), 2000-2100 Ma; Mojave and Yavapai-Mazatzal provinces (Yav. and Maz.), ~1700-2700 and 1600-1800 Ma (Bickford et al., 2008; Shufeldt et al., 2010; Strickland et al., 2013); North American magmatic gap (NAMG), ~1490-1610 Ma (Ross et al., 1992); A-type granitic province, 1300- 1500 Ma (Bickford et al., 1986; Evans and Zartman, 1990; Doughty and Chamberlain, 1996); Grenville province (Gren.), ~1000-1300 Ma (e.g., Eriksson et al., 2003; Grower and Krogh, 2001; McLelland et al., 2001); Edwardsburg volcanics (Ed. vol.) and central Idaho plutons (CIP), ~650-685 Ma (Lund et al., 2003; 2010); and Lemhi arch 485-500 Ma (Lund et al., 2010).

Table 1.1

Table 1

Sample I.D.	Location	Suite name	Map ID	Lithology	Latitude	Longitude	Maximum depositonal age LA-ICPMS *	CA-IDTIMS [3]
12DS14	Stibnite	upper quartzite	Ouq	quartzite	44.9203	-115.3007	1012 ±31 Ma [2]	
12DS16	Stibnite	middle quartzite	O∈mq	quartzite	44.9233	-115.2992	ca. 1120 Ma [1]	
12DS33	Stibnite	quartzite of middle marble	O∈qm	quartzite	44.9633	-115.3056	ca. 480 Ma [1]	502.72 ±0.99 Ma
14DS12	Stibnite	quartzite of middle marble	O∈qm	quartzite	44.9931	-115.3708	ca. 486 Ma [1]	503.3 ±3.3 Ma
10RL888	Stibnite	lower quartzite	∈lq	quartzite	44.9306	-115.3218	1634 ±20 Ma [2]	
12DS19	Stibnite	lower quartzite	∈lq	quartzite	44.9271	-115.2998	ca. 1770 Ma [1]	
12DS24	Stibnite	lower quartzite	∈lq	quartzite	44.9727	-115.3118	1459 ±23 Ma [2]	
QPC	Stibnite	quartz pebble conglomerate	∈Zcq	conglomerate	44.9255	-115.3223	598 ±21 Ma [2]	667.2 ±1.5 Ma
14RL011a	Stibnite	quartzite and schist	Zqs	quartzite	44.9303	-115.2947	ca. 651 Ma [1]	668.4 ±1.2 Ma
10RL893	Stibnite	quartzite of Profile Creek	Zqp	quartzite	44.9751	-115.4197	624 ±26 Ma [2]	768 ±74 Ma
10RL878	Edwardsburg	Moores Station Formation	Zmq	quartzite	44.9272	-115.3182	609 ±15 Ma [2]	653.2 ±2.0 Ma
BC14-05	Edwardsburg	Placer Creek Member	Zpg	diamictite	45.1563	-115.36317	1315 ±80 Ma [2]	
BC14-04	Edwardsburg	Golden Cup Member	Zpg	calc-silicate quartzite	45.16165	-115.36237	ca. 2450 Ma [1]	
BC14-03	Edwardsburg	Wind River Meadows Member	Zwr	diamictite	45.16225	-115.3615	757 ±35 Ma [2]	693 ±23 Ma
BC14-02	Edwardsburg	Wind River Meadows Member	Zwr	diamictite	45.16265	-115.36093	672 ±36 Ma [2]	692.0 ±6.2 Ma
BC14-01	Edwardsburg	Wind River Meadows Member	Zwr	quartzite	45.1632	-115.36047	ca. 970 Ma [1]	
09RL774	Edwardsburg	Square Mountain Formation	Zsm	quartzite	45.1030	-115.2963	ca. 1438 Ma [1]	
09RL775	Edwardsburg	Square Mountain Formation	Zsm	quartzite	45.1654	-115.3220	ca. 1315 Ma [1]	

* $^{206}Pb/^{238}U < 1000$ Ma < $^{206}Pb/^{207}Pb \pm 2\sigma$ Ma

[1] maximum depositional age interpreted from dominant, youngest LA-ICPMS peak

[2] maximum depositional age interpreted from youngest LA-ICPMS calculated date

[3] maximum depositonal age interpreted from youngest, most confident CA-IDTIMS calculated upper intercept date anchored at 94.28 ±0.22 Ma as discussed in text

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CHAPTER TWO

Epiclastic versus pyroclastic? Using tandem *in situ* and isotope dilution U-Pb zircon geochronology to improve age models for the Cryogenian Pocatello Formation, southeastern Idaho

Abstract

In southwestern Idaho, volcanic rocks interbedded with glacial diamictite of the Pocatello Formation provide new age constraints on Cryogenian glaciation in the Cordillera. Zircon from two rhyolitic pyroclastic beds sampled from glacigenic strata of the lower Scout Mountain Member, analyzed by both *in situ* and isotope dilution U-Pb analysis, yield precise eruption and depositional ages of 697.78 ± 0.18 and 697.05 ± 0.28 Ma. These dates constrain the depositional age of the lower of two diamictite intervals in the Scout Mountain Member. Along with a new high-precision detrital peak at ~675 Ma from siliciclastic units immediately overlying the lower diamictite, these data are consistent with a correlation of the lower diamictite with the ~717-660 Ma Sturtian glaciation. Additionally, new CA-IDTIMS data indicates the previously published age constraint of ~667 Ma from a "reworked fallout tuff" above the upper diamictite unit (Fanning and Link, 2004) is only a maximum depositional age from epiclastic detritus. The lack of a firm minimum age constraint for the upper diamictite and associated cap-carbonate are thus not inconsistent with litho- and chemo-stratigraphic correlations with the ~645-635 Ma Marinoan glaciation.

1. Introduction

Late Neoproterozoic (Cryogenian) glacial successions are recognized worldwide and have been interpreted to record global glaciations as part of the 'Snowball Earth' hypothesis (Kirschvink, 1992; Hoffman et al., 1998; Hoffman and Schrag, 2002). The

Snowball Earth model stems from sedimentological and paleomagnetic evidence indicating glacial conditions at sea level at low latitudes (Harland, 1964; Kirschvinik, 1992; Evans, 2000; Evans and Raub, 2011). The existence of low latitude ice sheets suggests pervasive glaciation at higher latitudes and elevations throughout the world, thus, resulting in a 'Snowball Earth'. A fundamental tenet of the hypothesis is the global synchrony of the onset of glaciation at low latitude and deglaciation globally. However, the number, timing and duration of these glacial episodes remain controversial geochronologic constraints are limited.

Two late Neoproterozoic, or Cryogenian low-latitude glaciations are generally agreed upon: the earlier Sturtian (~720-660 Ma) and the later Marinoan (~645-635 Ma) (Hoffman and Schrag, 2002; Hoffman and Li, 2009), which are both associated with cap carbonates with distinctive lithological and isotopic characteristics (Hoffman, Macdonald, and Halverson, 2011).

The onset of the Sturtian glaciation is constrained between 717.43 ± 0.14 Ma and 716.47 ± 0.24 Ma (isotope dilution thermal ionization mass spectrometry, or IDTIMS) by dated volcanic rocks below and within the Rapitan Group in Yukon, Canada (Macdonald et al., 2010). This age model is consistent with the onset of the Sturtian glaciation in South China, where a volcaniclastic unit directly below the lowermost Chang-an Formation was dated with secondary ion mass spectrometry (SIMS) on zircon at 715.9 ± 2.8 Ma (Lan et al., 2014). Additionally, in Arctic Alaska, volcaniclastic strata directly below the Hula Hula diamictite yielded a 719.5 ± 0.3 Ma (IDTIMS) date on the youngest population of zircon (Cox et al., 2015).

Some commonly cited dates interpreted to be syn-Sturtian age constraints include: 711.5 ±0.3 Ma (IDTIMS) for a tuffaceous bed near the base of the Gubrah Formation in Oman (Bowring et al., 2007); 709 ±5 Ma (SHRIMP) later revised to 686 ±4 Ma (SHRIMP) and to 687.4 ± 1.3 Ma for tuff breccia below the Scout Mountain Member of the Pocatello Formation in southern Idaho (Fanning and Link, 2004; Fanning and Link, 2008, and Condon and Bowring, 2011, respectively); 685.5 ±0.4 Ma (IDTIMS) for a volcaniclastic diamictite low in the Scout Mountain Member of the Pocatello Formation (Keeley et al., 2013); 685 ±7 and 684 ±4 Ma (SHRIMP) dates for rhyodacite flows from the Edwardsburg Formation of central Idaho (Lund et al., 2003); and 659 ±6 (SHRIMP) date for volcaniclastic layers of the Wilyerpa Formation in Australia (Fanning and Link, 2008).

Age constraints on the termination of the Sturtian glaciation include a 663 ± 4 Ma (SHRIMP) date on a tuffaceous bed in the post-glacial Datangpo Formation in South China (Zhou et al., 2004); a 662.4 ± 3.9 Ma (Re-Os) date from the cap carbonate at the base of the Twitya Formation of Canada (Rooney et al., 2014); a 659.0 ± 4.5 Ma (Re-Os) date from the cap carbonate directly above the Maikhan-Uul diamictite in Mongolia (Rooney et al., 2015), and a 657.2 ±5.4 Ma (Re-Os) date for the base of the post-glacial Aralka Formation in Australia (Kendall, Creaser, and Selby, 2006). The ~57 Myr span across these dates, combined with possible issues regarding glacial affinity, stratigraphic context and/or interpretation of isotopic dates themselves, raise questions regarding further subdivision of the Sturtian into multiple discrete glaciations (e.g., Spence, LeHeron, and Fairchild, 2016, and references therein), or the plausibility of a prolonged Sturtian glaciation lasting from ~716 Ma to ~660 Ma (Rooney et al., 2014; 2015), as well as the regional and global correlation of Sturtian glacial deposits; however, in any one sequence there is only one Sturtian cap carbonate and transgressive sequence (Hoffman et al., in press).

Maximum age constraints for the Marinoan come from pre-glacial deposits in China and Australia: a 654.5 ± 3.8 Ma (sensitive high-resolution ion microprobe, or SHRIMP) U-Pb zircon ash bed age for the top of the Datangpo Formation (Zhang, Jiang, and Han, 2008), and a Re-Os isochron black shale age of 643 ± 2.4 Ma for the Tindelpina Member in Australia (Kendall et al., 2006).

Synglacial age constraints on the Marinoan episode are defined by glacial deposits with U-Pb zircon ash bed ages of 635.5 ± 1.2 Ma (IDTIMS) in the Ghuab Formation in Namibia (Hoffman et al., 2004), 636.3 ± 4.9 Ma (SHRIMP) fallout tuff from the Nantuo Formation in South China (Zhang et al., 2008), and 639.29 ± 0.26 Ma for an ash bed in glaciomarine sediment of the Ghaub Formation in Namibia (Prave et al., 2016). The end of the Marinoan glacial episode is marked by a 635.2 ± 0.6 Ma (IDTIMS) volcanic ash layer within the cap carbonate of the Doushantuo Formation in South China (Condon et al., 2005) and an indistinguishable 635.2 ± 0.6 Ma date for an ash bed in central Namibia (Prave et al., 2016). These data indicate that Marinoan glaciation had a duration >4 My, possibly as long as ~20 My, with a termination at ~635 Ma.

The Neoproterozoic rock record of northern Utah and southeastern Idaho provides a well-preserved stratigraphic succession spanning pre-, syn- and post-glacial strata within the Pocatello Formation. Diamictite-bearing strata within this formation record two glacigenic successions, but age determination has proved challenging and thus correlations with Neoproterozoic glacial deposits has remained uncertain (e.g., Crittenden, Christie-Blick, and Link, 1983; Prave, 1999; Lund et al., 2003; Fanning and Link, 2004; Fanning and Link, 2008; Macdonald et al., 2013a; Condon and Bowring, 2011; Keeley et al., 2013). High-precision age determinations within these diamictite-bearing strata can provide a foundation for regional correlation and provide further tests for models of the nature of the Cryogenian glaciations.

We present tandem laser ablation-inductively coupled plasma mass spectrometry (LA-ICPMS) and high-precision chemical abrasion-isotope dilution thermal ionization mass spectrometry (CA-IDTIMS) U-Pb dates on the same zircon crystals from five key samples of volcanic, glacigenic, and non-glacigenic strata from the Pocatello Formation in southeastern Idaho. The procedures used in this study highlight the need for tandem *in situ* microbeam techniques and high-precision CA-IDTIMS analysis to clearly resolve issues related to Pb loss and the recognition of mixed age populations (e.g., Mattinson, 2005; Bowring et al., 2007; Condon and Bowring, 2011). These new high-precision dates substantially revise the age model for the Pocatello Formation, and allow us to establish hard syn-depositional age constraints on glacigenic strata, revise previously estimated minimum constraints on glaciation, and demonstrate that both Sturtian and Marinoan glacial strata are preserved within the Cryogenian stratigraphy of southeast Idaho.

2. The Pocatello Formation

Neoproterozoic rocks of southeastern Idaho and northern Utah formed within extensional basins as part of the multi-phased Rodinian supercontinent breakup that culminated with the development of a passive continental margin extending from eastern Alaska to California by ~540 Ma (e.g., Bond, Kominz, and Devlin, 1983; Ross, 1991, Levy and Christie-Blick, 1991; Lund et al., 2003; Dickinson, W.R., 2006; Colpron, Logan, and Mortensen, 2002; Macdonald 2013b; Fedo and Cooper, 2001; Yonkee et al., 2014) (Figure 1). Regional exposures today are generally located along the eastern edge of the late Jurassic to early Cenozoic Cordilleran fold-and-thrust belt of the eastern Basin-and-Range province. Commonly correlated glacial deposits in the region include the Pocatello Formation in Idaho, the Mineral Fork Formation, Perry Canyon Formation, Horse Canyon Formation, Sheeprock Group, and Trout Creek sequence in Utah (e.g., Crittenden, Christie-Blick, and Link, 1983; Link et al., 1993; Balgord et al., 2013; Yonkee et al., 2014). Thrust sheets associated with these exposures belong to the Willard – Paris – Putnam system of northern Utah and southeastern Idaho, and the Tintic – Sheeprock – Canyon Range system of west-central Utah (Link et al., 2011 and references therein).

The greenschist facies Pocatello Formation is a roughly 1.5 km thick package of dominantly siliciclastic, lesser volcanic rocks, and rare carbonate rocks exposed in the Pocatello and Bannock Ranges of southeastern Idaho and northern Utah (Link et al., 1993; Link and Christie-Blick, 2011; Dehler, Anderson, and Nagy, 2011). The formation was transported eastward ~100 km in the Mesozoic by the Paris-Willard thrust and was subsequently exposed via regional normal faulting during Basin and Range extension (Link, 1983; Yonkee et al., 2014). The type section of the Pocatello Formation, located at the Portneuf Narrows east of Pocatello, ID, is divided into three members: the lower Bannock Volcanic Member, the middle Scout Mountain Member and an informal upper member (Link, 1983) (Figure 1).

Exposures of the Bannock Volcanic member comprise mafic metavolcanics and volcaniclastic rocks (Link, 1983). The volcanic rocks are tholeiitic-alkaline to alkaline in composition, and are products of intra-plate rift volcanism (Harper and Link, 1986; Keeley and Link, 2011). Felsic volcanic clasts within the overlying Scout Mountain Member represent a cryptic felsic component of bimodal volcanism within the Bannock Volcanic Member (Fanning and Link, 2004). Additionally, basalts are locally interbedded within the Scout Mountain Member, providing evidence that the transition between the two members may be conformable (Keeley and Link, 2011; Keeley et al., 2013). Exposures of the unit vary in thickness (from 200-450 m) and grade upward into the overlying Scout Mountain Member.

A variety of lithotypes comprise the ~800m thick Scout Mountain Member (Link, 1982) (Figure 1). The base is composed primarily of a matrix-supported diamictite that contains predominantly mafic and rare felsic volcanic clasts, some of which are glacially striated. This “lower diamictite” is overlain by siltstone, sandstone, cobble conglomerate and an “upper diamictite”. The upper matrix-supported diamictite is clast-rich, containing granitic, gneissic, quartzitic, and felsic volcanic clasts, including rare glacially striated, yet abundant faceted, clasts (Link, 1982). Overlying the upper diamictite is a pink to buff-colored dolomite with interbedded sandstone that culminates with aragonite crystal fans (Lorentz, Corsetti, and Link, 2004; Dehler et al., 2011). The lateral extent (>100 km), correlation with glacial deposits to the south (northern Utah’s Oxford Mountain and Perry Canyon, Yonkee et al., 2014), and occasional striated/faceted clasts indicate a glacial origin for the diamictites (e.g., Crittenden et al, 1983; Link, Miller, and Christi-Blick, 1994). As a whole, this unit has been interpreted to record the relatively rapid deposition of immature subaqueous sediments containing glacial till (Crittenden et al., 1983; Link et al., 1994) representing two phases of the ~717-660 Ma Sturtian glaciation

(Fanning and Link, 2004; 2008; Balgord et al., 2013; Yonkee et al., 2014). However, based upon the distinctive lithology of the upper cap carbonate, others have correlated the upper diamictite unit with the ~645-635 Ma Marinoan glaciation (e.g. Dehler et al., 2011; Petterson et al., 2011; Macdonald et al., 2013a). The Scout Mountain Member grades into the informal upper member, which comprises primarily (>600 m) laminated sandstone and a lesser carbonate unit (Link, 1982). The upper carbonate and sandstone units represent shoreface and deeper water conditions interpreted to be the result of post-glacial eustatic sea level rise (Link, 1983; Link et al., 1994; Dehler et al., 2011).

Radioisotopic age determination for the Pocatello Formation have proved to be problematic. Fanning and Link (2004) interpreted the diamictite portion of the Pocatello Formation to be younger than their U-Pb zircon SHRIMP date of 717 ± 4 Ma from a rhyolitic clast within the upper diamictite at Portneuf Narrows, which they later revised to 701 ± 4 Ma (Fanning and Link, 2008). They went on to contend that a U-Pb zircon SHRIMP date of 709 ± 5 Ma, from an epiclastic tuff breccia some 50m below diamictite, further constrains the maximum age for the formation (Fanning and Link, 2004). A second SHRIMP analysis of the original sample by Fanning and Link (2008) yielded a revised date of 686 ± 4 Ma, and those authors also acknowledged the stratigraphic position was not well constrained due to extensive Sevier age thrusting within the section.

Condon and Bowring (2011) re-evaluated the original epiclastic tuff breccia sample of Fanning and Link (2004), along with a recollected equivalent sample (with Fanning and Link) from within the diamictite, using high-precision CA-IDTIMS (precision ~0.1%) and found a multimodal detrital signal. Condon and Bowring (2011) concluded that the relatively low precision of SHRIMP dates (precision >1%) lacked the resolution to determine mixed date populations, and assigned a maximum depositional age of 687 ± 1.3 Ma on the basis of the youngest single CA-IDTIMS date. This is not to say that *in situ* techniques are inaccurate themselves, but are more subjective in interpretation as they lack sufficient resolution to determine mixed date populations within a sample at less than a few percent difference, or identify those grains that have experienced small amounts of Pb-loss thereby recording spuriously younger dates. The lack of resolution by *in situ* techniques alone indicates that regional correlation based on weighted means of the youngest grains in detrital units should not be made as they may or may not be accurate or equivalent.

This point was further highlighted in a subsequent investigation by Keeley et al. (2013). The authors describe a suite of facies within the Oxford Mountain tuffite (including Fanning and Link’s (2004, 2008) and Condon and Bowring’s (2011) epiclastic tuff breccia), interbedded and with gradational contacts within the lower diamictite of the Scout Mountain member. CA-IDTIMS analysis of five different tuffite samples identified a range of crystal ages from ~685 Ma up to ~709 Ma, which must represent epiclastic detritus from protracted regional volcanism. A youngest weighted mean date of 685.5 ± 0.4 Ma for ten grains from one sample of volcaniclastic diamictite with cobble-sized volcanic clasts relatively high in the lower diamictite stratigraphy provided a robust maximum depositional age for any overlying units. Keeley et al. (2013) favorably correlated this 685.5 ± 0.4 Ma detrital maximum age with relatively imprecise weighted mean SHRIMP dates of 685.6 ± 7 and 684.6 ± 4 Ma reported for volcanics from central Idaho’s Edwardsburg Formation (Lund et al., 2003). However, the SHRIMP data from Lund et al.’s (2003) investigation are complex (ranging from ~660 Ma to 717 Ma with a few analyses at ~600, 740 and 1180 Ma), may have experienced from variable degrees of Pb-loss (thus skewing the apparent dates), and likely only subjectively correlates with the more precise CA-IDTIMS analysis.

The disparity in maximum ages for the Pocatello Formation raise uncertainty about its published minimum age as well. In accord with Condon and Bowring's (2011) work, Petterson et al. (2011) suggest caution accepting Fanning and Link's (2004) minimum SHRIMP date for glaciation of 667 ± 5 Ma from their reworked fallout tuff situated above the upper diamictite at Portneuf Narrows as robust minimum age constraint of glaciation. Data from this study demonstrate that the "reworked fallout tuff" is in fact an epiclastic siltstone and should be regarded as a maximum depositional age only, with the likeliness that the enclosing strata are much younger.

3. Samples and Methods

Samples were collected from three locations near Pocatello, ID: two rhyolitic pyroclastic flows (Scout 2 & Scout 3) – originally reported in Link, 1982 – were collected near the base of the western side of Scout Mountain (Figure 2); a pair of samples including the lower volcaniclastic diamictite (69PL09) and overlying green arkosic sandstone (70PL09) were collected on the south side of the Portneuf Gap; and the "reworked fallout tuff" (67PL09) was recollected from the overturned section on the north side of Portneuf Gap (Figure 3).

Zircons were separated from all samples using standard gravimetric and magnetic mineral separation techniques, annealed at 900°C for 60 hours, mounted in epoxy, polished until the centers of grains were exposed, carbon coated and imaged by cathodoluminescence (CL) on a JEOL T-300 scanning electron microscope fitted with a

GATAN MiniCL detector at Boise State University. CL images were used to identify internal zircon features and morphological traits to determine preferred spot locations for U-Pb and trace element LA-ICPMS using a New Wave UP213 laser probe coupled to an X-Series 2 quadrupole mass spectrometer according to the methods described in Rivera at al. (2013). The laser-beam diameter was aperatured at either 25μm or 30μm, depending upon the size of grain being evaluated. Following LA-ICPMS, selected grains were plucked from the epoxy and chemically abraded following a procedure modified from Mattinson (2005), whereby individual crystals were subjected to a single high-temperature hydrofluoric acid treatment for 12 hours to aggressively remove damaged regions that have experienced Pb-loss. Zircons were spiked with an EARTHTIME mixed ^{205}Pb-^{233}U-^{235}U tracer solution (ET535) and dissolved. U and Pb were separated from solution via ion chromatography following Krogh (1973), loaded onto rhenium filaments in preparation for subsequent U-Pb TIMS analysis using a GVI (IsotopX) Isoprobe-T multi-collector TIMS fitted with an ion-counting Daly detector for single collector Pb isotope analysis, and 10^{12} ohm resistor amplifiers for static Faraday cup analysis of U isotopes. Individual results are listed in Appendix 2A-2D and summarized in Table 1.

3.1. Scout Mountain

Sample Scout-2 was taken from an ~5 m thick outcrop of normally-graded, silicified quartz and plagioclase-phyric rock with a very fine-grained matrix, identified in the field as a rhyolitic pyroclastic flow, within the volcaniclastic lower diamictite of the Scout Mountain Member. Immediately below the rhyolitic outcrop is a ~35 m interval of volcaniclastic litharenite sandstone and diamictite which is lithologically similar to the Oxford Mountain tuffite facies of Keeley et al. (2013) with distinctive flat, micaceous black clasts and grit-to-pebble sized, felsic, altered volcanic clasts. Beneath these facies is an 8-10 m thick interval containing abundant quartz and feldspar phenocrysts within a fine-grained matrix, from which sample Scout-3 was taken. Below the Scout 3 sample horizon, more than 50 m of lower Scout Mountain member strata are exposed that include volcaniclastic litharenite sandstone overlying basaltic flows. The base of the section is truncated by a fault and juxtaposed against indurated quartzite that is likely part of the Brigham Group (Link, 1982).

3.2. Porneuf Gap

The diamictite sample (69PL09), equivalent to sample 62PL09 of Keeley et al. (2013), was obtained from the lowest exposure of the lower diamictite at south gap. The arkosic sandstone sample (70PL09) was taken from ~20 m above the underlying lower diamictite and is equivalent to Keeley et al.'s (2013) plagioclase-arkose sample (15PL08). The sequence north of Portneuf Gap is overturned, however the top of the upper diamictite is clearly exposed. The 'reworked fallout tuff bed' 20 m above the upper diamictite as described by Fanning and Link (2004) is a deep green porcellanous siltstone that was recollected as our sample 67PL09.

4. Zircon U-Pb Geochronology

Thin section petrography of the Scout-2 and Scout-3 rhyolite samples provides abundant evidence for pyroclastic deposition of the sampled beds, including cognate fine-grained holocrystalline volcanic lithic clasts, pumiceous lapilli clasts with possible relict fiamme, euhedral and sharply fragmented volcanic bipyramidal quartz, tabular feldspar phenocrysts, and relict spherulites (Figure 4). These samples lack holoclastic detritus and the zircon crystal populations lack any evidence of abrasion or rounding. The LA-ICPMS results from the rhyolitic samples (Scout 3 & 2) yield solely Neoproterozoic dates. Weighted means of ≤20% discordant analyses yield irresolvable stratigraphically out of sequence weighted-mean dates of 659 ± 11 and 647 ± 7.6 Ma for the rhyolitic samples (Figures 5A & 6A). Initial isotope dilution analysis on a set of grains without chemical abrasion pretreatment yielded scattered and discordant U-Pb dates (~624 to 690 Ma) roughly defining a Pb-loss trend. CA-IDTIMS analysis using a pretreatment chemical abrasion step at 180°C yielded a narrower spread of more concordant, older U-Pb dates ranging from ~677 to 702 Ma. A third round of CA-IDTIMS analysis using more aggressive chemical abrasion at 200°C yielded more uniform dates, which, when combined with comparable dates from the 180°C abrasion rounds, returned in sequence weighted mean U-Pb dates of 697.78 ± 0.18 Ma and 697.05 ± 0.28 Ma, in accord with stratigraphic superposition (Figures 5B, 5C, 6B, and 6C).

The igneous ages reported here exhibit a spread in dates that requires rejection of outliers in order to arrive at a best estimation of the timing of volcanic crystallization. Because these zircons were analyzed following the chemical abrasion pretreatment, we attribute much of the spread in dates as pre-eruptive growth or unmitigated Pb-loss (Michel et al., 2016). Regarding sample Scout 3, both 180°C and 200°C chemical abrasion pretreatment resulted in a spread of IDTIMS dates with young plateaus that overlap (Figure 5B). These plateaus are interpreted to represent timing of eruption (closure of the U-Pb system) and are pooled intp the weighted mean calculation. The dates older than the plateau are excluded from the weighted mean calculation and are interpreted to represent pre-eruptive growth (antecrysts) or minor inheritance (xenocryst). The same 180°C and 200°C chemical abrasion pretreatment steps for sample Scout 2 do not similarly plateau. However, six analyses do overlap to form a statistically significant weighted mean age that we report as timing of eruption (Figure 6B). We attribute the spread in older dates not included in the weighted mean as recording similar antecryst growth and younger dates as unmitigated Pb-loss (open system). It is clear that more aggressive acid dissolution (i.e., higher temperature) reduces the open system domains in the zircon crystals from Scout 2, but complete removal is not ubiquitous. We view the incomplete removal of open system domains is attributed to the crystals having experienced extreme damage particularly resistant to full removal via chemical abrasion.

LA-ICPMS analyses for the lower diamictite sample (69PL09, equivalent to Keeley et al. (2013) sample 62JK09 yielded a range of (≤20% discordant) U-Pb dates between ~625 and 760 Ma with a dominant peak at ~700 Ma, and a few scattered dates from ~1120 to 1670 Ma (Figure 7A). CA-IDTIMS analysis (with chemical abrasion at 200°C) on 16 grains selected from the youngest apparent LA-ICPMS population yielded single grain U-Pb dates ranging from ~697 to 706 Ma, not including two grains plucked erroneously (z1 & z16) and one analysis with relatively large error (z4) (Figure 7C).

The arkosic sandstone (70PL09, equivalent to Keeley et al. (2013) sample 15PL08) yields two dominant peaks of LA-ICPMS U-Pb dates (≤20% discordant) between ~600 and ~700 and ~1640 and ~1900 Ma along with a few scattered dates between the peaks and up to ~2850 Ma (Figure 8A). CA-IDTIMS analysis (following chemical abrasion at 200°C) on 11 grains selected from the youngest apparent LA-ICPMS population yielded a range of U-Pb dates with a dominant youngest peak at ~675 Ma (Figure 8C).

Zircon crystals from the siltstone sample (67PL09), equivalent to Fanning and Link's (2004) "reworked fallout tuff", ranged from euhedral and prismatic (~60-70% of the population), to sub-rounded to rounded in morphology (30-40% of the population). LA-ICPMS analyses of the former prismatic grains from the siltstone yield a range of (≤20% discordant) U-Pb dates between ~580 and 730 Ma, with a dominant peak at ~655 Ma, and a few scattered dates into the Paleoproterozoic and Archean (Figure 9A). CA-IDTIMS analysis (with chemical abrasion at 200°C) on 10 grains selected from the youngest apparent LA-ICPMS population yielded a suite of U-Pb dates with a youngest dominant peak at ~675 Ma (Figure 9C).

5. Discussion

5.1. The Sturtian "lower diamictite"

Initial LA-ICPMS analysis on zircons from the two pyroclastic beds in the Scout Mountain Member of the Pocatello Formation yield normally distributed populations yielding weighted mean dates of 659 ± 11 Ma and 647 ± 7.6 Ma with reasonable coherence (mean square of the weighted deviates, MSWD = 1.5 and 3.2 respectively) (Figures 3A & 4A). If the percent discordance cutoff of ≤20% used for weighted mean age calculation were reduced to ≤10%, the data is still roughly normally distributed with dates of 661 ± 15 Ma (MSWD of 1.9, n = 12 of 13) and 656 ± 10 (MSWD of 2.6, n = 30 of 33). It could be reasonably concluded from these LA-ICPMS dates that the entire formation above the lowest event bed is no older than ~660 Ma, based on the igneous nature of the samples. However, our chemical abrasion IDTIMS data demonstrate the erroneous nature of this interpretation, and highlight how the resolution of *in situ* techniques cannot discern subtle amounts of Pb-loss, inheritance or mixed age populations in Neoproterozoic zircon crystals.

CA-IDTIMS analysis utilizing differing levels of pretreatment chemical abrasion temperatures reduced the amount of discordance for the samples by eliminating zones of high uranium content, accumulated radiation damage, and variable Pb-loss (Figures 3 & 4) (Michel et al., 2016). This study's tandem approach of dating using both LA-ICPMS and CA-IDTIMS on the same grains highlights the ubiquity of Pb-loss in untreated zircon crystals and cautions against detailed age interpretation or correlation strictly from *in situ* techniques. *Aggressive* CA-IDTIMS U-Pb analysis has revealed stratigraphically consistent (in sequence) and precise dates of 697.05 ± 0.28 Ma and 697.78 ± 0.18 Ma; ~37-50 My older than the LA-ICPMS dates.

We highlight the term *aggressive* in reference to the elevated chemical abrasion temperatures (note that increasing the temperature of chemical abrasion from 180° to 200°C increases the dissolution rates by a factor of four) that were required to completely remove Pb-loss domains. These results illustrate the flexibility of the chemical abrasion methodology, and the ability of experimentation to establish confidence in the mitigation of Pb-loss. We interpret these CA-IDTIMS dates as eruption and depositional ages for the two rhyolitic beds. These dated event beds provide robust depositional syn-glacial age constraints for the lower diamictite in the Scout Mountain member of the Pocatello Formation, and tie these glacigenic strata to the 717-660 Ma Sturtian glaciation.

Following the same tandem LA-ICPMS and aggressive CA-IDTIMS procedure, the lower diamictite unit (69PL09) yields a youngest CA-IDTIMS U-Pb date of ~697 Ma, ~70 My older than the youngest group of apparent LA-ICPMS dates from this study, and just within error of the youngest SHRIMP analysis (689 ± 8 Ma) previously determined for the same unit (Keeley et al., 2013) (Figure 7). Assuming equivalent sampling, we interpret the disagreement in LA-ICPMS and SHRIMP dates with those determined by CA-IDTIMS to be the result of variable Pb-loss within the grains analyzed, thus skewing the calculated dates. The 697 Ma youngest CA-IDTIMS date is indistinguishable from the underlying rhyolitic event beds, suggesting the ubiquity of reworking of these volcanics into the pencontemporaneous and younger lower diamictite strata. The ~697 Ma pyroclastic flow deposit ages, when combined with Keeley et al.'s (2013) maximum CA-IDTIMS age of 685.5 ± 0.4 Ma within the higher strata of the lower diamictite at Oxford Mountain, demand that the lower diamictite was deposited over at least twelve million years. However, dates from the tuffite of Keeley et al. (2013) are only maximum depositional ages, thus the upper portions of the lower diamictite unit could be younger. Similarly the approximately 70 m of polymict litharenite below the dated pyroclastic flows represent an additional unknown duration of early Sturtian sedimentation.

LA-ICPMS analysis of the arkosic sandstone (70PL09) yield a youngest age peak at ~680 Ma supporting an expected younging trend upsection (Figure 8A). The four youngest LA-ICPMS analysis (≤20% discordant) range from ~637-660 Ma, suggest the sandstone unit, along with all overlying strata, would be post-Sturtian to Marinoan. Additionally, the youngest population of LA-ICPMS dates favorably compares with SHRIMP data from an equivalent sample (15PL08) that range down to ~662 Ma (Keeley et al., 2013) (Figure 8B). However, CA-IDTIMS analyses following aggressive chemical abrasion substantially revises the apparently youngest LA-ICPMS dates and resulted in five overlapping youngest dates at ~675 Ma, again ~15-38 My older than apparent LA-

ICPMS dates (Figure 8C) and indicative of a Pb-loss bias in some *in situ* results. We interpret the cluster of ~675 Ma CA-IDTIMS dates to represent a robust maximum depositional age for the sandstone unit. Thus, all strata above the unconformity at the top of the lower diamictite are younger than ~675 Ma. This compares favorably with the timing of Sturtian deglaciation at ~660 Ma (Rooney et al., 2015).

5.2. The Marinoan "upper diamictite"

The green siltstone sample (67PL09), equivalent to Fanning and Link's (2004) "reworked fallout tuff" above the upper diamictite and cap dolostone at Portneuf Gap, yields a multi-modal spread of LA-ICPMS and CA-IDTIMS dates more indicative of a detrital signal rather than that of a volcanic fallout deposition (Figure 9). LA-ICPMS dates from prismatic grains range from ~600 Ma to ~725 Ma and include numerous Paleoproterozoic and Archean dates. Similarly, subsequent CA-IDTIMS analyses on grains from the youngest LA-ICPMS population yield a spread of dates (ranging from ~674 Ma to 686 Ma) not indicative of a single igneous event. We conclude that a pyroclastic origin for this bed is untenable, and rather that it represents an exceptionally fine-grained siltstone with abundant Cryogenian epiclastic volcanic detritus.

Perhaps even more importantly, the ~675 Ma maximum depositional age from CA-IDTIMS determined for the siltstone is indistinguishable from that of the arkosic sandstone (70PL09, ~675 Ma) sampled much lower in the section, just above the lower diamictite (Figure 10). These new data leaves the timing of deposition of the upper glacial strata in the region open to further study, as the maximum depositional age for the upper diamictite (and associated cap dolostone) is likely significantly younger than the ~675 Ma date of the youngest grains found throughout the upper Scout Mountain

Member of the Pocatello Formation. These detrital zircon geochronological data are consistent with a post-Sturtian deglaciation depositional history for the upper Scout Mountain Member, and by inference, a Marinoan identity for the upper diamictite of the Pocatello Formation (e.g., Dehler et al., 2011; Petterson et al., 2011; Macdonald et al., 2013a).

5.3. Laurentian correlation

Traditional correlation of Neoproterozoic rocks along the North American Cordillera generally recognizes two phases of Cryogenian glaciation, represented by glacial deposits correlated with an older-Sturtian glaciation and a younger-Marinoan glaciation (e.g., Eisbacher, 1985). Complete sections of Sturtian- and/or Marinoan-related deposits are rare, due to erosional and structural omissions and lithostratigraphic correlations are further complicated by syn-sedimentary tectonism associated with the piecemeal break-up of Rodinia (e.g., Macdonald et al., 2013a). The Cryogenian stratigraphy of the northern Canadian Cordillera is probably the most well characterized with extensive exposure and robust U-Pb zircon dates of 717.4 ± 0.2 and 716.9 ± 0.2 Ma (CA-IDTIMS) bracketing the onset of glacial sedimentation in the Rapitan Group (Macdonald et al., 2010) and a Re-Os date of 662.4 ± 3.9 Ma in the overlying cap carbonate defining the termination of the Sturtian glaciation (Rooney et al., 2014; 2015) (Figure 11). Additionally, a 632.3 ± 5.9 Ma age was obtained in the basal Sheepbed Formation in Mackenzie Mountains, in the transgressive sequence directly above glacial deposits in the Stelfox Member of the Ice Brook Formation and the Ravensthroat cap carbonate (Rooney et al., 2015). This age agrees well with geochronological constraints on the termination of the Marinoan glaciation globally (e.g., Hoffman et al., 2004;

Condon et al., 2005; Calver et al., 2013; Prave et al., 2016). Using the two glacial model for cross-Cordilleran correlations, the Sturtian Rapitan Group and the overlying ~662 Ma basal Twitya cap carbonate have been correlated with the Surprise diamictite and Sourdough limestone in the Death Valley area and the Marinoan Stelfox diamictite and Revensthroat cap carbonate with the Wildrose diamictite and the Sentinel Peak Member of the Noonday Formation (e.g., Prave, 1999; Petterson et al, 2011; Macdonald et al., 2013). The strong chemo- and litho-stratigraphic similarities between the cap carbonate above the upper-diamictite in Idaho and the Sentinel Peak Member in Death Valley have suggested in turn that the two glacigenic intervals in the Pocatello Formation also represent the Sturtian and Marinoan glaciations (Dehler et al., 2011; Petterson et al., 2011; Macdonald et al., 2013a). Alternatively, motivated largely by the ~667 Ma SHRIMP date from the 'tuff' above the upper diamictite, but also by distain for the chemo- and litho-stratigraphic correlations of cap carbonates, others have suggested that both diamictites in Idaho represent two phases of the Sturtian glaciation and that the Marinoan glaciation may be represented by a sequence boundary higher in the succession (e.g., Fanning and Link, 2004; 2008; Balgord et al., 2013; Yonkee et al., 2014).

New data presented here provide robust age constraints for the lower diamictite of the Pocatello Formation, consistent with deposition during the ~717-660 Ma Sturtian glaciation, and demonstrate that the 'tuff' above the upper diamictite is epiclastic and only provides a maximum age constraint. Thus, we interpret these data to be more consistent with an assignment of the upper diamictite to the ~645-635 Ma Marinoan glaciation, and correlative with lithologically similar deposits of this age throughout the Cordillera (Figure 11).

6. Conclusions

The new data presented here highlights the need for a tandem approach of *in situ* and CA-IDTIMS analytic techniques to accurately date zircons and establish clear age constraints on Neoproterozoic strata. Additionally, this contribution reemphasizes previous conclusions of Condon and Bowring (2011) that encourage caution when attempting to correlate dates or create robust timelines from data determined by differing analytic protocols (i.e., *in situ* vs. TIMS), which may not have sufficient resolution to identify mixed date populations, or subtle Pb-loss that may skew calculated dates.

The ~697 Ma depositional age constraint for the lower Scout Mountain Member of the Pocatello Formation underscores other findings that these strata are age equivalent with other dated Sturtian deposits, e.g. the ~716-660 Ma Rapitan Group in Canada (Macdonald et al., 2010), ~697-690 Ma diamictites interbedded with the Gataga Volcanic Complex in northern British Columbia (Eyster et al, accepted), and the Ghubrah Formation in Oman, which contains a tuff dated at ~711 Ma (Bowring et al., 2007) (Figure 11). The base of the Pocatello Formation is fault-bounded, thus a parsimonious interpretation is that the preserved strata in the lower Scout Mountain Member represent an interval of deposition within an extended Sturtian glacial event. The detrital zircon evidence for ~675 Ma zircons in the non-glacial shoreface sandstones, unconformably above the lower diamictite, is consistent with the current model of Sturtian deglaciation at ~660 Ma (Kendall et al., 2006; Rooney et al., 2014; 2015).

A ~665 Ma age for the “reworked fallout tuff” of Fanning and Link (2004) has not been reproduced; rather this sample contains a clear epiclastic detrital zircon age distribution with a youngest population of ~675 Ma crystals. This signal is essentially the same as that found much lower in the Scout Mountain Member, i.e., in the shoreface sandstones above the disconformity on the lower diamictite. The recognition of these detrital zircon signals increases the probability that the upper diamictite-cap carbonate succession in the upper Scout Mountain Member is a product of Marinoan glaciation. Additional high-precision chronostratigraphy throughout Cryogenian deposits will ultimately provide a means for resolving the timing and correlation for both regional and globally similar Snowball Earth deposits.

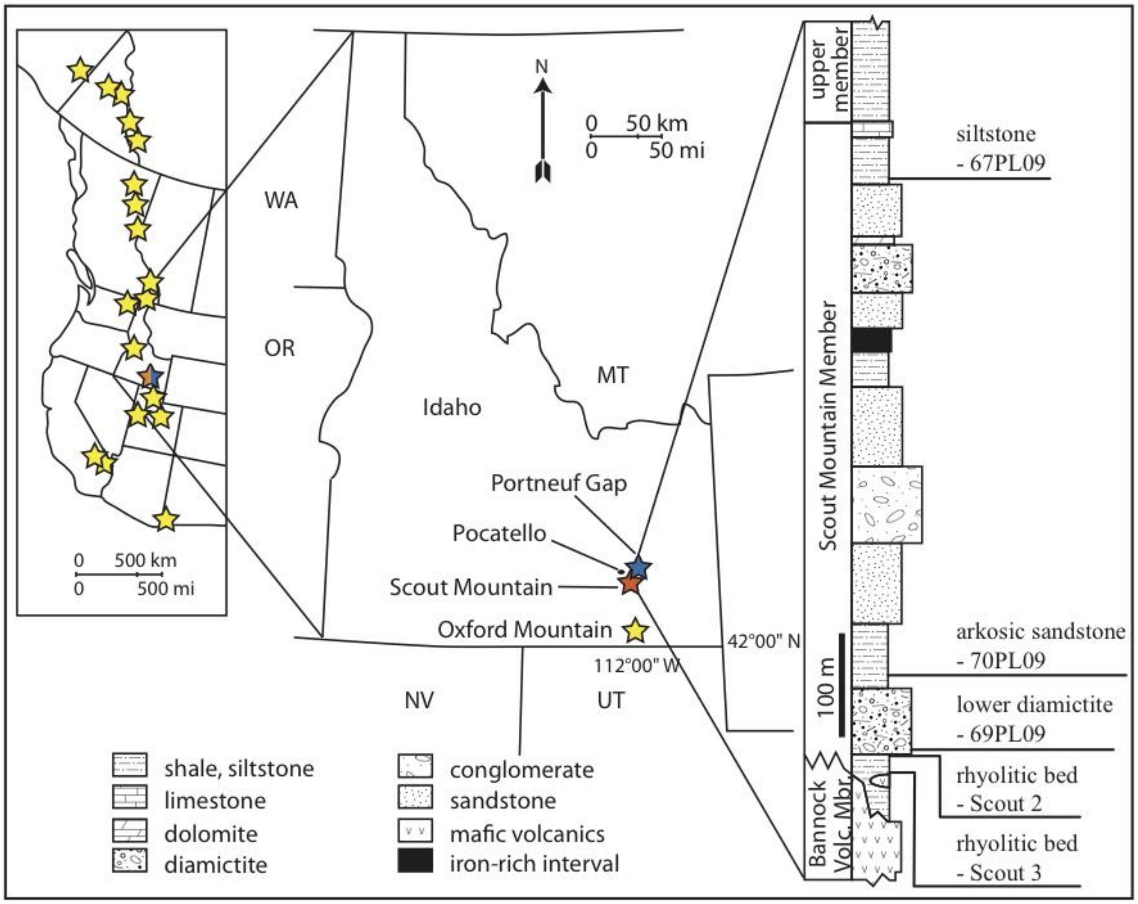

Figure 2.1: Regional maps and general stratigraphic section. Stars on map show locations of diamictite-bearing successions along the Cordillera, modified from Fanning and Link (2004). General stratigraphic section of Pocatello Formation modified from Dehler et al. (2011). Orange and blue represents igneous and detrital samples, from Scout Mountain and Portneuf Gap respectively, represented in this study.

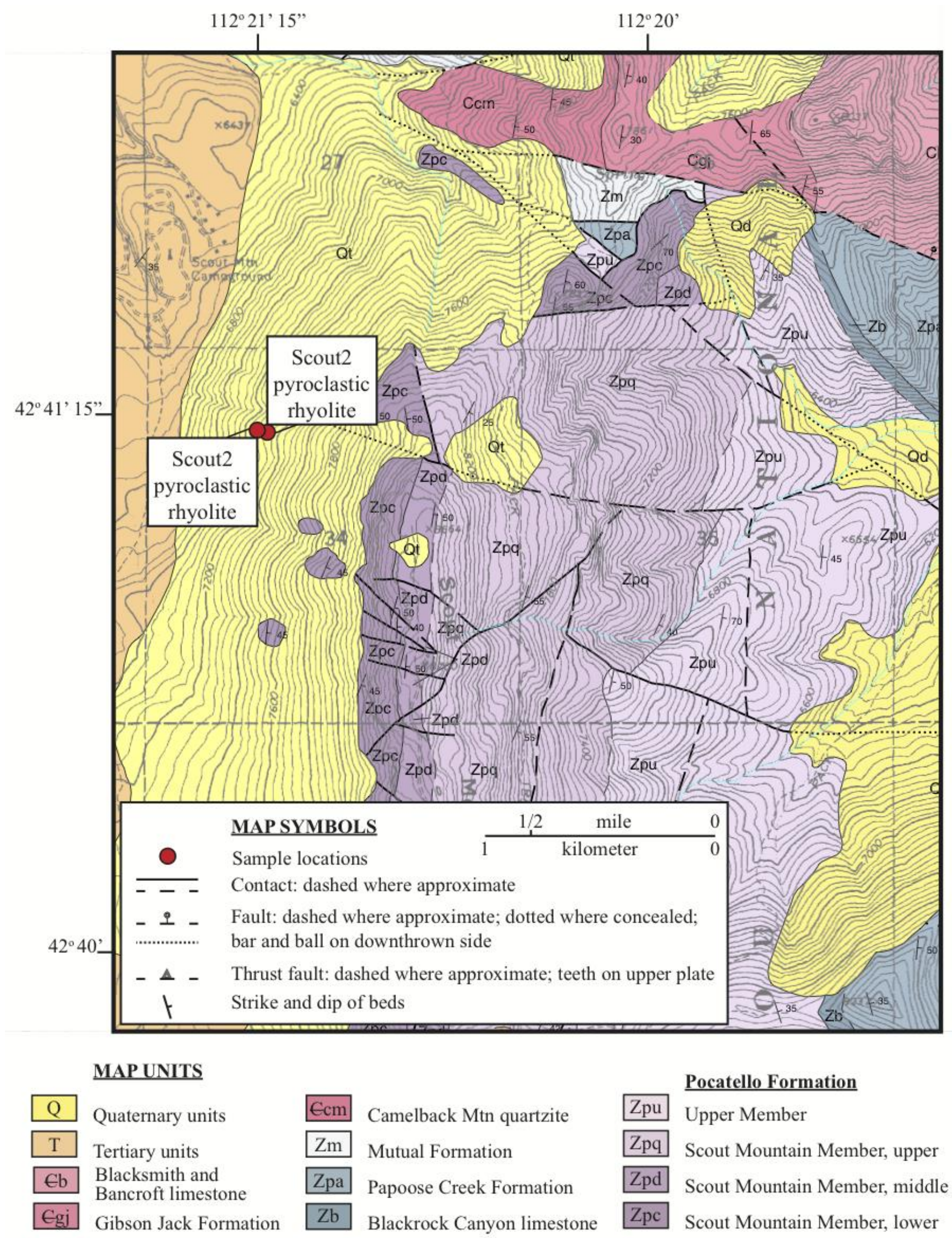

Figure 2.2: Geologic map of the Scout Mountain area and sample locations from this study (red circles). Map modified from Platt (1998).

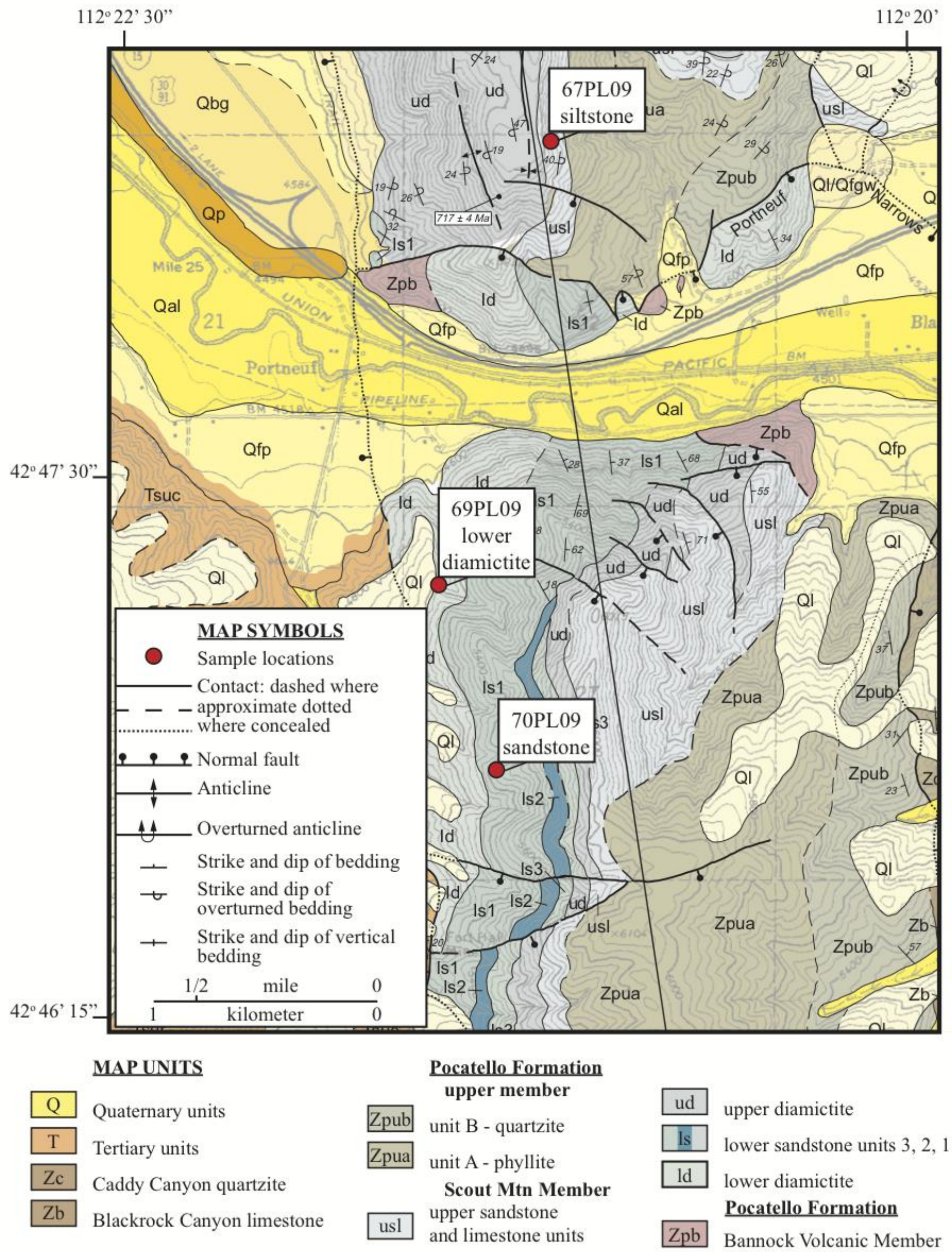

Figure 2.3 Geologic map of the Portneuf Narrows area and sample locations from this study (red circles). Map modified from Rodgers et al. (2006).

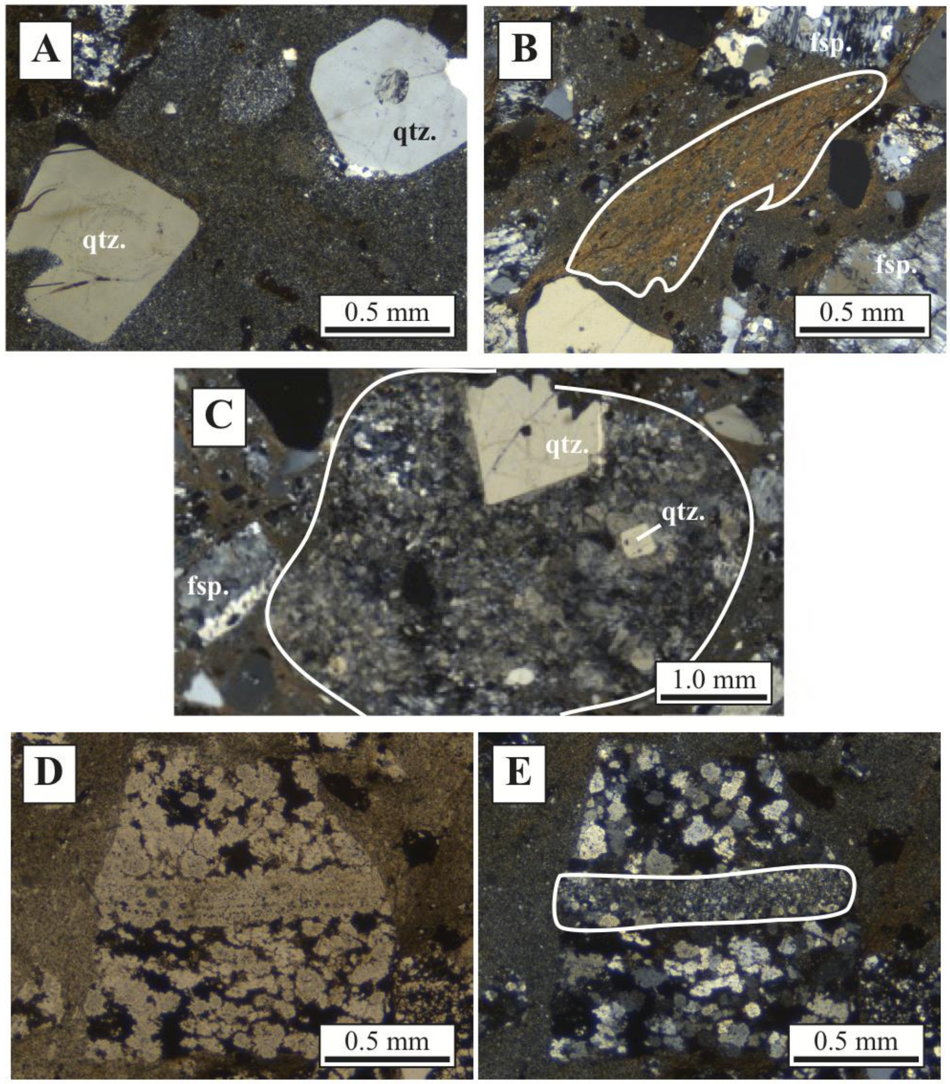

Figure 2.4: Thin section photomicrographs of characteristic textures in samples Scout 2 and Scout 3. A) Bipyramidal and embayed quartz; B) pumiceous lapilli (outlined) with possible relict fiamme; C) cognate, fine-grained lithic clast (outlined) with embedded volcanic quartz, and euhedral feldspar; and D & E) plane and cross-polarized light relict spherulitic texture dominantly replaced with roughly equidimensional quartz. Elongate band of connected, overlapping speroids (outlined) may represent flow layering.

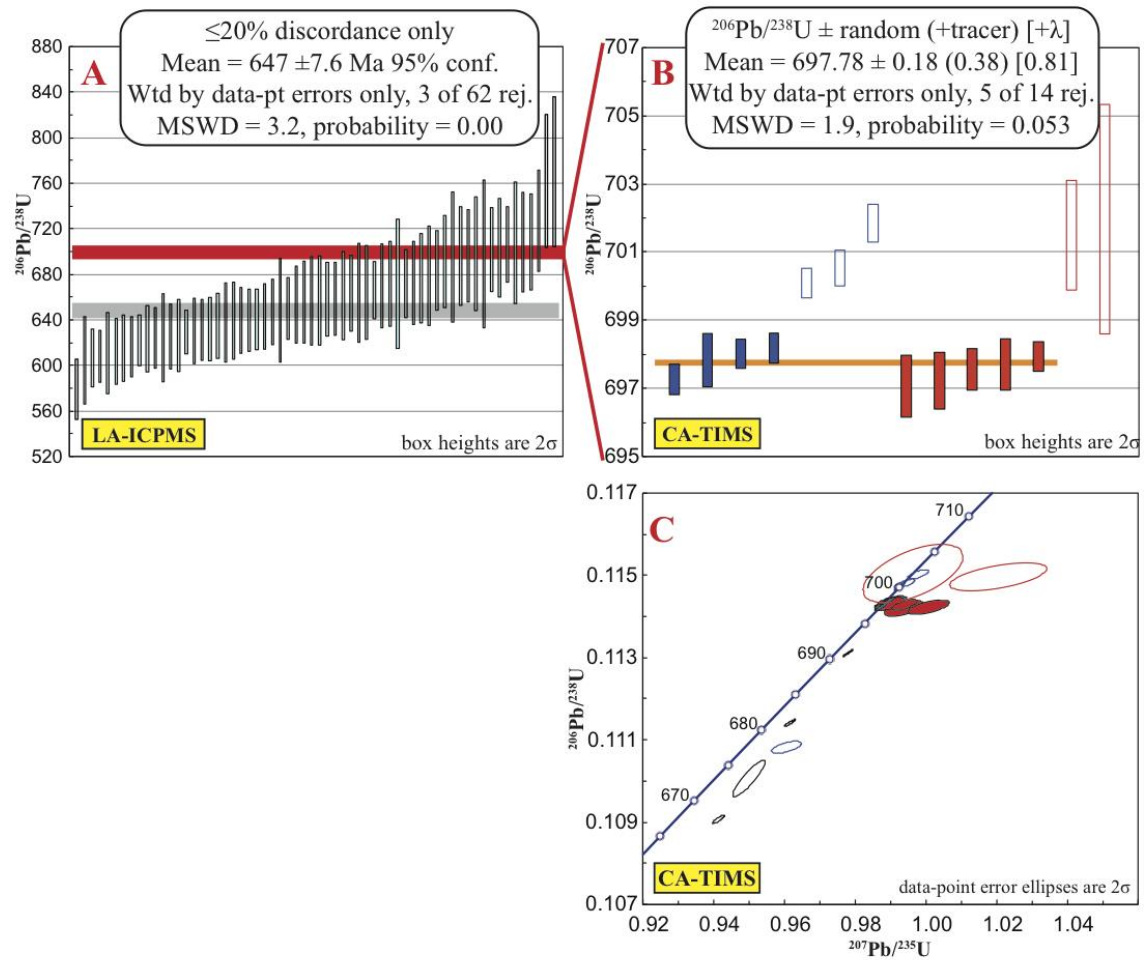

Figure 2.5: A - Ranked $^{206}Pb/^{238}U$ weighted mean plot for sample Scout 3, using only <20% discordant LA-ICPMS analysis. Solid bars represent data used in age calculation. Horizontal grey bar represents calculated mean age and uncertainty. B – Ranked $^{206}Pb/^{238}U$ weighted mean plot for CA-IDTIMS analysis of single zircons from Scout 3. Blue bars represent analysis using 180°C chemical abrasion and red bars using 200°C chemical abrasion. Solid bars represent data used in age calculation. Horizontal orange bar represents calculated mean age and uncertainty. C - Scout 3 Wetherill Concordia plots for TIMS analysis without chemical abrasion (black), 180oC chemical abrasion (blue), and 200oC chemical abrasion (red).

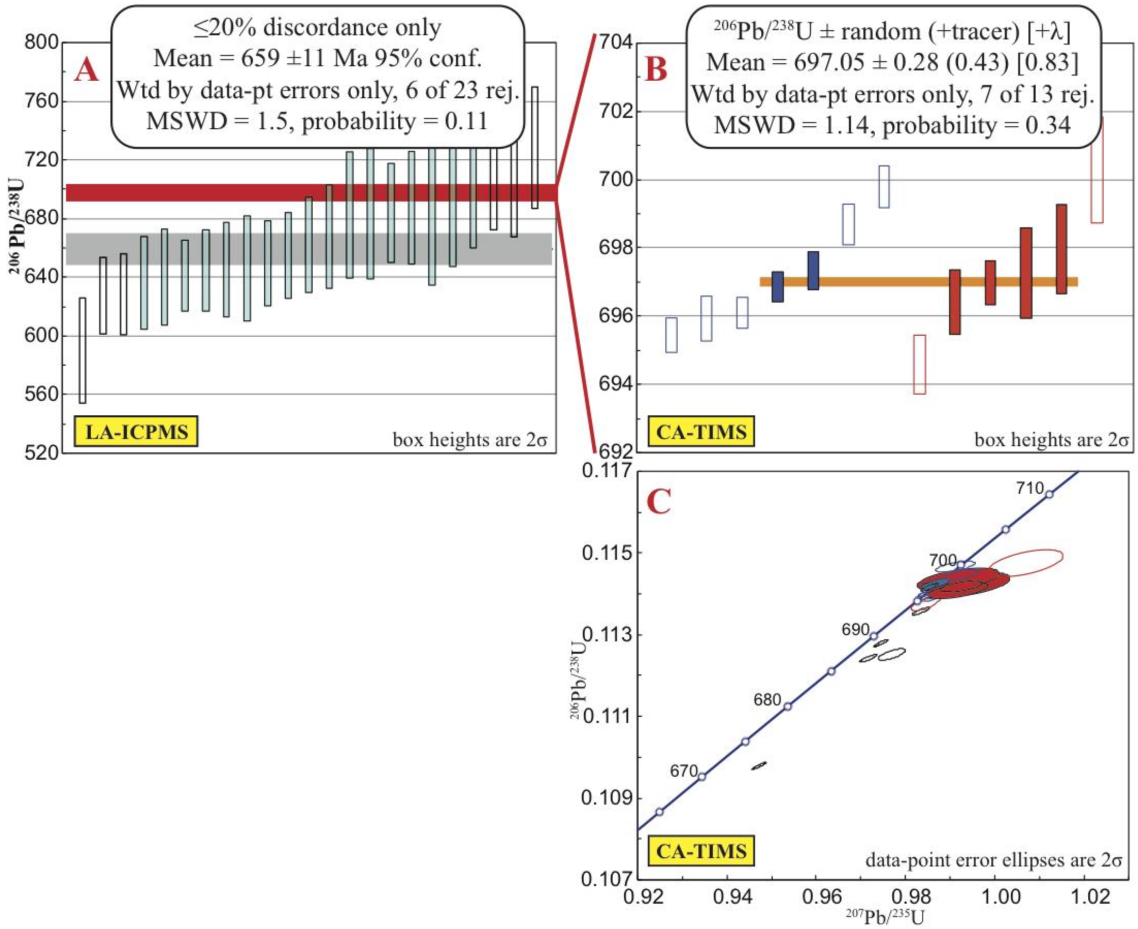

Figure 2.6: A - Ranked 2^{06}Pb/^{238}U weighted mean plot for sample Scout 2, using only <20% discordant LA-ICPMS analysis. Solid bars represent data used in age calculation. Horizontal grey bar represents calculated mean age and uncertainy. B - Ranked ^{206}Pb/^{238}U weighted mean plot for CA-IDTIMS analysis of single zircons from Scout 2. Blue bars represent analysis using 180^{o} C chemical abrasion and red bars using 200^{o} C chemical abrasion. Solid bars represent data used in age calculation. Horizontal orange bar represents calculated mean age and uncertainty. C - Scout 2 Wetherill Concordia plots for TIMS analysis without chemical abrasion (black), 180^{o} C chemical abrasion (blue), and 200^{o} C chemical abrasion (red).

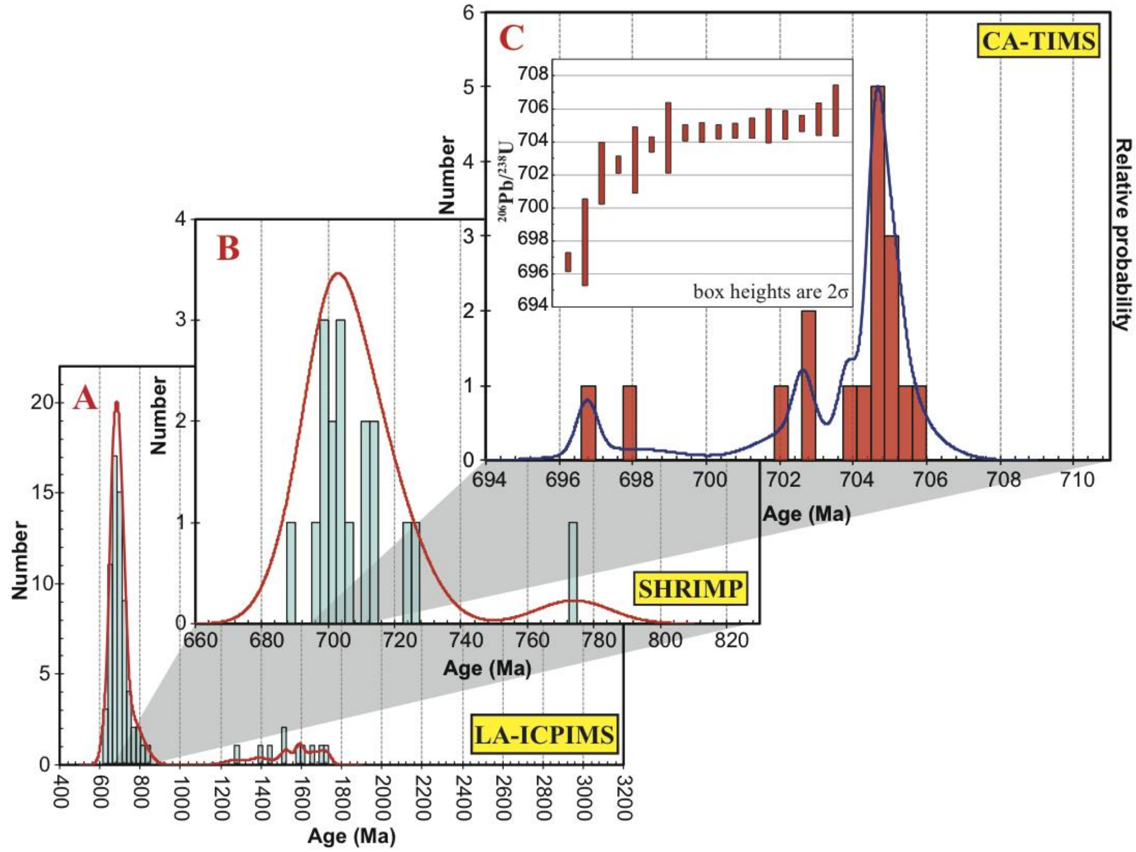

Figure 2.7: Probability density and weighted mean $^{206}Pb/^{238}U$ zircon plots of results from lower diamictite. A - LA-ICPMS results from sample 69PL09 showing youngest dominant age peak (≤20% discordant) between ~625-760 Ma and a few Proterozoic results; B - SHRIMP results from sample 15PL08 (Keeley et al., 2013) showing a similar youngest age peak between ~690-725 Ma; C - CA-IDTIMS results from zircons plucked from youngest apparent LA-ICPMS population from sample 69PL09, following retreatment chemical abrasion at 200°C, with youngest age peak at ~676.8 Ma and two at ~702.6 Ma and 704.5 Ma; C - Inset represents ranked $^{206}Pb/^{238}U$ plots and associated error of results from CA-IDTIMS analysis.

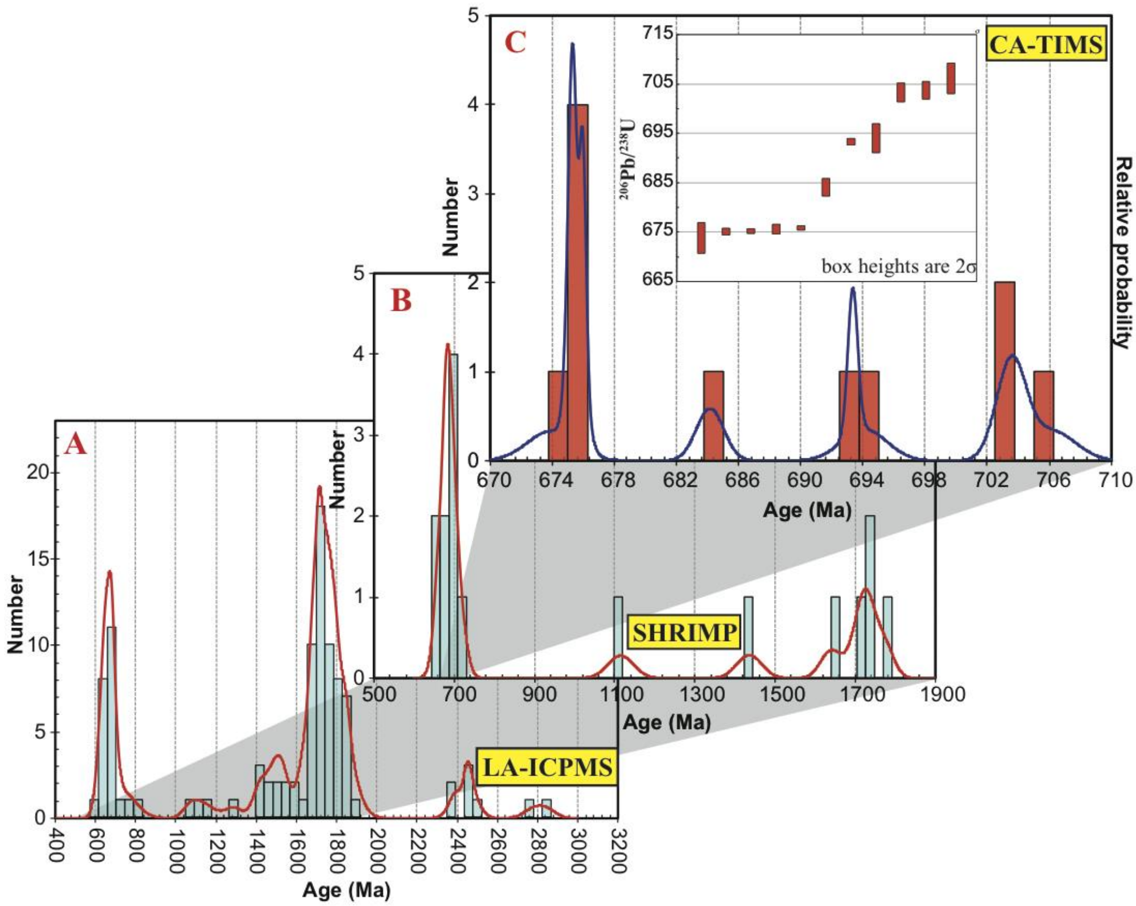

Figure 2.8: Probability density and weighted mean $^{206}Pb/^{238}U$ zircon plots of results from arkosic sandstone sample between lower and upper diamictite. A - LA-ICPMS results from sample 70PL09 showing youngest dominant age peak (≤20% discordant) between ~600-700 Ma and Proterozoic and Archean peaks; B - SHRIMP results from sample 15PL08 (Keeley et al., 2013) showing a similar youngest age peak between ~660-720 Ma and similar Proterozoic peaks; C - CA-IDTIMS results from zircons plucked from youngest apparent LA-ICPMS population from sample 70PL09, following pretreatment chemical abrasion at 200°C, with dominant youngest age peak at ~675 Ma; Inset represents ranked $^{206}Pb/^{238}U$ plots and associated error of results from CA-IDTIMS analysis.

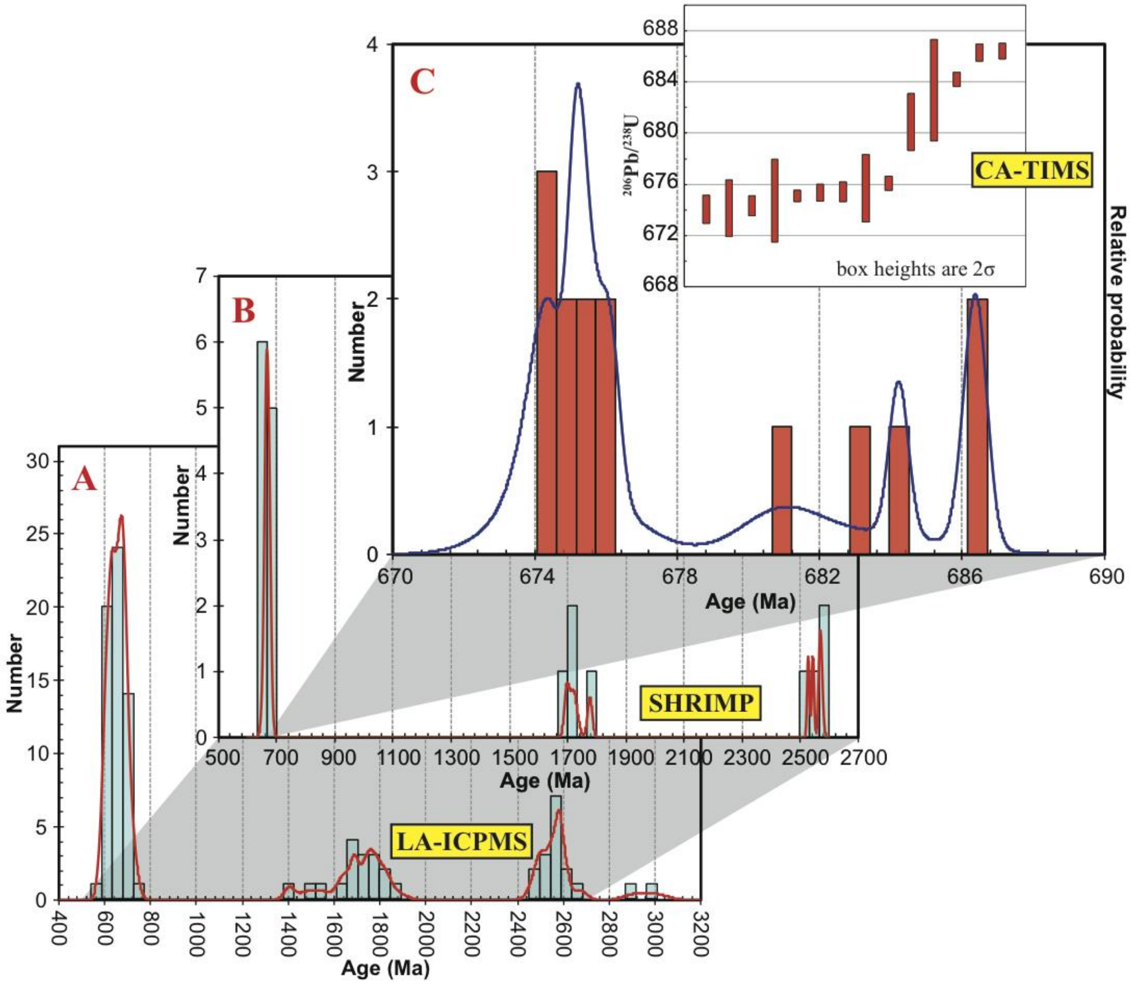

Figure 2.9: Probability density and weighted mean $^{206}Pb/^{238}U$ zircon plots of results from siltstone sample overlying the cap sandstone. A - LA-ICPMS results from sample 67PL09 showing youngest dominant age peak (≤20% discordant) between ~580-730 Ma and two Paleoproterozoic and Archean peaks; B - SHRIMP results from sample 145PL02 (Fanning and Link, 2004) showing a similar youngest age peak from ~640-700 Ma and two equivalent Paleoproterozoic and Archean peaks; C - CA-IDTIMS results from zircons plucked from youngest apparent LA-ICPMS population from sample 67PL09, following pretreatment chemical abrasion at 200°C, with dominant youngest age peak ~675 Ma. Inset represents ranked $^{206}Pb/^{238}U$ plots and associated error of results from CA-IDTIMS analysis.

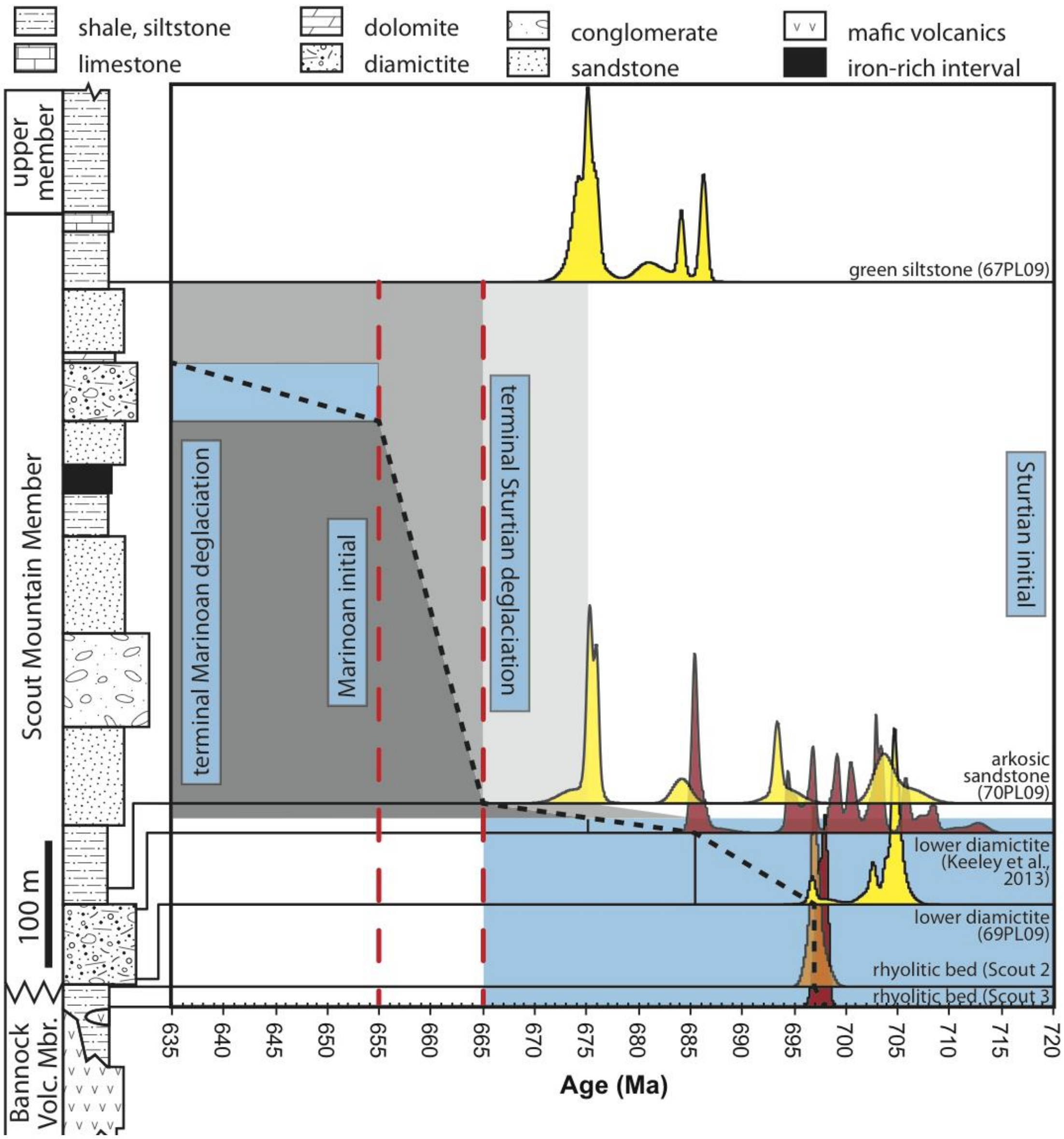

Figure 2.10: Compilation diagram showing stratigraphic location of CA-IDTIMS $^{206}Pb/^{238}U$ relative probability plots. Dashed black line and corresponding colored regions represent possible depositional age constraints for each sample.

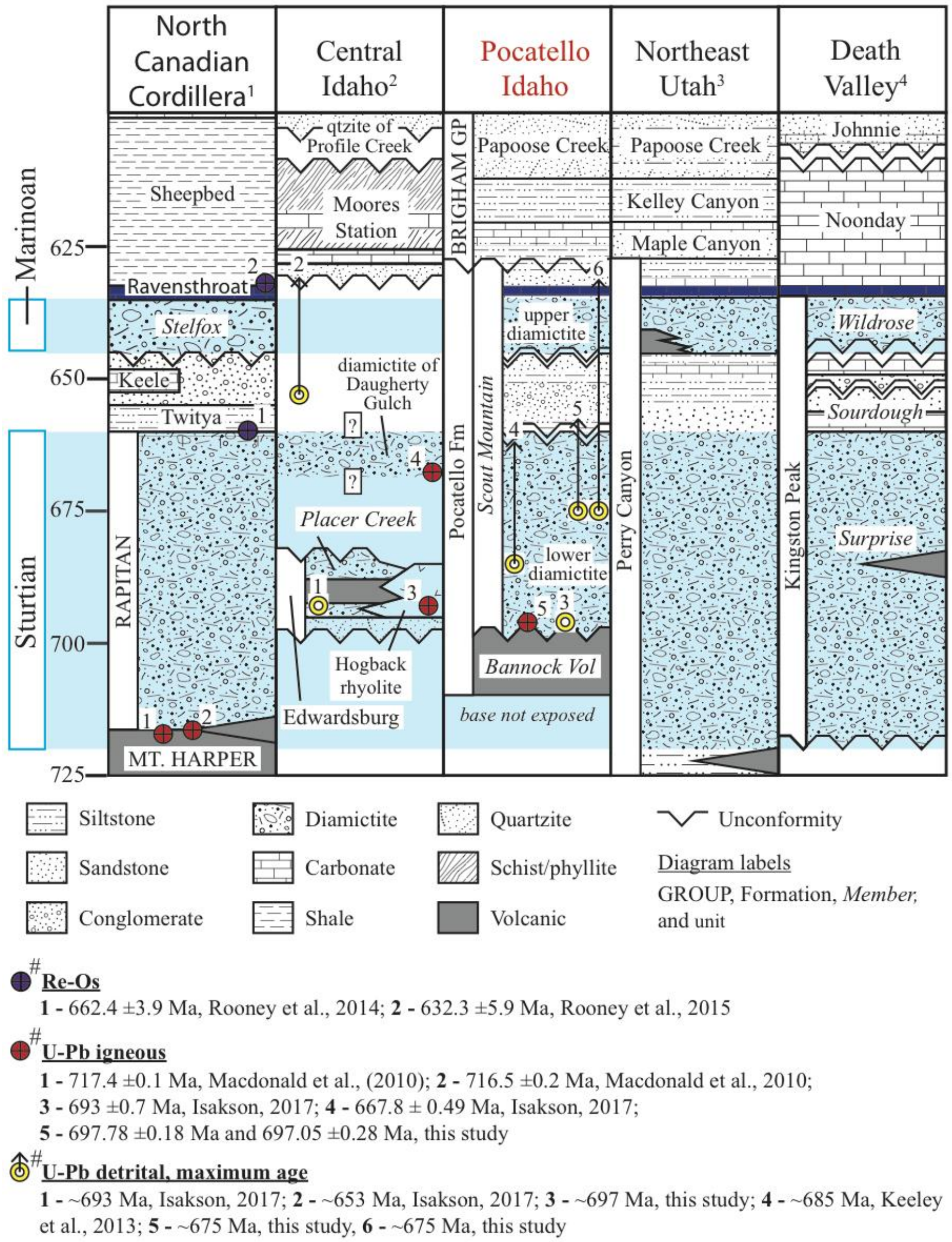

Figure 2.11: Correlation chart of late Neoproterozoic successions along the western margin of Laurentia. Position of colored circles is equivalent to calculated date listed (without error) and corresponding arrows signify general stratigraphic position of sample. Simplified stratigraphic sections and general position of unconformities are modified from: 1 - Rainbird et al., 1996; Macdonald et al., 2010; Rooney et al., 2014, Eyster et al., 2017; 2 - Lund et al., 2010, Isakson, 2017a; 3 - Balgord et al., 2013; Yonkee et al., 2014, 4 - Petterson et al., 2011, Macdonald et al., 2013.

Table 2.1

Table 1

Sample I.D.	Location	lithology	Latitude	Longitude	Ages (Ma)* LA-ICPMS	CA-IDTIMS
67PL09	Portneuf Narrows, north side	green siltstone	42.80471	-112.35241	~580-730 [1]	~675 [2]
70PL09	Portneuf Narrows, south side	arkosic sandstone	42.78038	-112.35519	~600-700 [1]	~675 [2]
69PL09	Portneuf Narrows, south side	lower diamictite	42.78752	-112.35981	~625-760 [1]	~697 [2]
Scout 2	Scout Mountain	pyroclastic rhyolitic bed	42.68681	-112.35367	659 ± 11 [3]	697.1 ± 0.28 [4]
Scout 3	Scout Mountain	pyroclastic rhyolitic bed	42.68689	-112.35425	647 ±7.6 [3]	697.8 ± 0.18 [4]

* $^{206}Pb/^{238}U$ only

[1] maximum depositional age range from youngest, dominant peak

[2] maxim depositional age interpreted from youngest, most confident CA-IDTIMS analyses

[3] weighted mean calculation of <20% discordant LA-ICPMS results

[4] weighted mean calculation of overlapping CA-IDTIMS results

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CHAPTER THREE

High-precision geochronological evidence for Marinoan glaciation and the pulse of rift magmatism from the Pocatello Formation, southeastern Idaho

Abstract

In southeast Idaho, volcanic and diamictite rocks of the Neoproterozoic lower Scout Mountain Member of the Pocatello Formation record the early Cryogenian Sturtian glaciation. High-precision, maximum depositional age constraints from U-Pb detrital zircon dates measured by chemical abrasion isotope dilution thermal ionization (CA-IDTIMS) for overlying, non-glacial shoreface sandstones sedimentation suggest deposition during the post-Sturtian deglaciation, and therefore that diamictite and cap carbonate higher in the section could be part of the Marinoan glaciation. New high-precision detrital zircon dates within these strata increase the probability that the upper diamictite, cap-carbonate, and overlying sand/siltstone strata record the Marinoan glaciation and its decay. Procedures used in this study continue to underscore the need for high-precision, CA-IDTIMS analytical techniques for ancient zircon that may have experienced Pb-loss. Further, our CA-IDTIMS detrital zircon age dataset provides a high-fidelity record of punctuated regional magmatism that can constrain the timing, tempo, and mechanism of Rodinian rifting.

1. Introduction

The Cryogenian Period (ca. 720-635 Ma) represents a time of extreme climate fluctuation, the breakup of the supercontinent Rodinia, and at least two low-latitude glaciations – the older Sturtian and younger Marinoan (e.g., Knoll and Walter, 1992; Hoffman et al., 1998; Hoffman and Schrag, 2002; Fairchild and Kennedy, 2007; Li et al., 2008; Shields-Zhou, Porter, and Halverson, 2016). Radiometric dating has demonstrated the onset of Sturtian glaciation to have occurred at ca. 717 Ma and postulated that it spans some 56 Ma, from ca. 716-660 Ma (Bowring et al., 2007; Macdonald et al., 2010; Lan et al., 2014; Rooney et al., 2014, 2015). The duration of Marinoan glaciation is thought to be substantially shorter, at least 4 and as much as 20 million years, beginning at ca. 655 Ma (Zhang, Jiang, and Han, 2008) and ending at ca. 635 Ma (Hoffmann et al., 2004; Calver et al., 2004; Condon et al., 2005; Zhang et al., 2008; Prave et al., 2016).

In southeastern Idaho and northern Utah, the Scout Mountain Member of the Pocatello Formation contains a diverse stratigraphic record of glacigenic and non-glacial sedimentation. Newly described ca. 697 Ma volcanic pyroclastic flows interbedded with glacigenic strata clearly place a lower diamictite interval within the Sturtian glacial event (Isakson, 2017). Overlying non-glacial deposits possess ca. 675 Ma detrital zircons consistent with Sturtian deglaciation at ca. 660 Ma (Isakson, 2017). These youngest ca. 675 Ma detrital grains are also found near the top of the Scout Mountain Member, above an upper diamictite and cap carbonate, in an epiclastic siltstone formerly interpreted as a reworked tuffite (Fanning and Link, 2004). The recognition of this detrital signal allows for the possibility that the upper glacigenic deposits of the Pocatello Formation are a product of Marinoan glaciation (Isakson, 2017).

To further test this hypothesis, tandem U-Pb laser ablation – inductively coupled plasma mass spectrometry (LA-ICPMS) and high-precision chemical abrasion – isotope dilution thermal ionization mass spectrometry (CA-IDTIMS) have been applied to detrital zircons from samples of the upper diamictite and overlying non-glacial strata comprising the uppermost Scout Mountain Member and overlying member of the Pocatello Formation. Procedures used in this study continue to underscore the need for tandem *in situ* techniques and high-precision CA-IDTIMS analysis to clearly resolve timing of deposits that have experienced Pb-loss. New dates presented here further increase the probability that the deposits are a product of Marinoan glaciation. As an additional outcome, CA-IDTIMS detrital age components produce a unique integrated record of punctuated regional magmatism, from ca. 705 Ma to ca. 655 Ma, that can help constrain different models of continental rifting during Rodinia breakup.

2. Geology

The Pocatello Formation is a roughly 1.5 km thick package of volcanic, mixed siliciclastic, and carbonate units exposed in the Pocatello and Bannock ranges of southeastern Idaho and northern Utah (Figure 1) (Link, 1982; Link et al., 1993; Link and Christie-Blick, 2011; Dehler, Anderson, and Nagy, 2011). The formation was transported eastward ~100 km in the Mesozoic by the Paris-Willard thrust and was subsequently exposed via regional normal faulting and extension (Link, 1983). The formation records rifting of the Neoproterozoic supercontinent Rodinia during widespread regional glaciation, marine and fluvial sedimentation, and the transition to a passive margin (e.g., Crittenden, Christie-Blick, and Link, 1983; Link, 1983; Link, Miller, and Christie-Blick, 1994; Lorentz, Corsetti, and Link, 2004; Corsetti and Lorentz, 2006). The Pocatello Formation is divided into three members: the lower Bannock Volcanic Member, the middle Scout Mountain Member and an informal upper member (Link, 1983).

Exposures of the stratigraphically lowest Bannock Volcanic Member vary in thickness from 200-450 m, and are composed of mafic metavolcanics and volcaniclastic rocks (Link, 1983). The volcanic rocks are tholeiitic-alkaline to alkaline in composition, and are the products of intra-plate rift volcanism (Harper and Link, 1986; Keeley and

Link, 2011). The Bannock Volcanic Member grades upward into the overlying Scout Mountain Member. Basalts are interbedded within the overlying Scout Mountain Member, providing evidence that the two members may be locally conformable (Keeley and Link, 2011; Keeley et al., 2013). Felsic volcanic clasts within the overlying Scout Mountain Member represent eroded and resedimented cryptic felsic components of bimodal volcanism within the Bannock Volcanic Member (Fanning and Link, 2004; Keeley et al., 2013). Rhyolitic pyroclastic beds positioned directly above the Bannock Volcanic Member and within the overlying glacigenic diamictite strata of the lower Scout Mountain Member represent primary examples of the felsic component of these volcanics (Isakson, 2017).

A variety of lithotypes compose the Scout Mountain Member. The dominantly non-glacial Scout Mountain Member is interpreted to record rapid deposition of immature, subaqueous sediments containing glacial deposits representing two phases of glaciation, with some evidence that the latter represents a Marinoan phase (Crittenden et al., 1983; Link et al., 1994; Dehler et al., 2011). The lateral extent (>100km), correlation with glacial-bearing deposits to the south (e.g., northern Utah's Oxford Mountain and Perry Canyon) and occasional presence of striated/faceted clasts support a partial glacial origin for the diamictite units (e.g., Crittenden et al., 1983; Link et al., 1994).

The lower portion of the Scout Mountain Member includes a matrix-supported, lower diamictite base, containing primarily mafic and occasional felsic volcanic clasts, and the aforementioned felsic pyroclastics. The lower diamictite is unconformably overlain by green arkosic sandstone and siltstone containing sedimentary structures consistent with shoreface deposition. These sandstones of the middle Scout Mountain

Member are overlain by a clast-supported cobble conglomerate exhibiting significant along-strike thickness variations. Rare beds of limestone underlie and overlie the cobble conglomerate; the conglomerate grades upward conformably into black sandstones (Link, 1982). The upper portion of the Scout Mountain Member is composed of a relatively clast-rich, polymict (generally granitic, gneissic, and felsic volcanic clasts, along with occasional striated quartzite clasts), matrix-supported upper diamictite, an overlying dolostone and chip breccia cap carbonate, and a series of sandstone and limestone beds. The carbonate and sandstone units suggest shoreface and deeper water conditions interpreted to be the result of post-glacial eustatic sea level rise (Link, 1983; Link et al., 1994). The Scout Mountain Member grades into the informal upper member that comprises >600 m of laminated sandstone (Link, 1982).

3. Samples and Methods

Samples were collected from the north and south sides of the Portneuf Narrows (Figure 2). Five samples (FHDZ-1, 65PL09, 72PL09, 73PL09, and 74PL09) of the upper diamictite were collected. Sample 65PL09 was collected from massive diamictite, ~50cm below the transition to the overlying cap dolostone and sandstone on the north side of the Portneuf Narrows. Upper diamictite samples from the south side of the Portneuf Narrows span a transition from more massive to stratified facies. Samples FHDZ-1 and 72PL09 were taken from the highest obviously massive portion and possess an unsorted matrix and large (>5cm to 30 cm) clasts. The lowermost stratified diamictite (sample 73PL09) was sampled from a ~10cm thick bed, ~30 cm above sample 72PL09, that contains coarse sand. The uppermost stratified diamictite (sample 74PL09) is from a ~millimeter- to centimeter-scale laminated bed, ~30 cm above sample 73PL09.

Along strike to the south, in the North Fort Hall section, the cap-carbonate sample (NFH) was taken from relatively pure dolostone that is interbedded with dolomite-chip breccia and sandstone (FHDZ-2) (Dehler et al., 2011). The sandstone (66PL09), sampled ~1.5 m above the diamictite sample (65PL09) from the north Portneuf Narrows contains dolomite chips along strike. A prominent green siltstone bed (sample 67PL09) above the top of the diamictite on the north side of Portneuf Narrows, described as “reworked fallout tuff” by Fanning and Link (2004), is in sharp contact with a lenticular sandstone bed with dolomite chips below, and grades into repetitive laminated shales and siltstones above (sample 68PL09).

Zircons were separated using standard gravimetric and magnetic mineral separation techniques. A random sample of >150 zircon grains was supplemented by a biased-pick of the most euhedral, prismatic zircon crystals for mounting and analysis. Zircons were annealed at 900°C for 60 hours, mounted in epoxy, polished until the centers of grains were exposed, carbon coated and imaged by cathodoluminescence (CL) on a scanning electron microscope. CL images were used to identify internal zircon features and morphological traits to determine preferred spot locations for U-Pb and trace element LA-ICPMS using a New Wave UP213 laser probe, coupled to an X-Series 2 quadrupole mass spectrometer. The laser beam diameter was aperatured at 25µm, with a 10 Hz shot repetition, and fluence of 5-6 J/cm^2. Further details of the analytical method are described in Rivera at al. (2013).

Following LA-ICPMS, selected grains were plucked from the epoxy and chemically abraded following a procedure modified from Mattinson (2005), whereby individual crystals were subjected to a single, high-temperature (190° C) hydrofluoric acid treatment for 12 hours to remove damaged regions that have experienced Pb-loss. Zircons were spiked with an EARTHTIME mixed ^{205}Pb-^{233}U-^{235}U tracer solution (ET535) and dissolved. U and Pb were separated from solution via ion chromatography following Krogh (1973), loaded onto rhenium filaments prior to U-Pb TIMS analysis using a GVI (IsotopX) Isoprobe-T multi-collector TIMS fitted with an ion-counting Daly detector for single collector Pb isotope analysis, and 10^{12} ohm resistor amplifiers for static Faraday cup analysis of U isotopes.

4. Zircon Geochronology

Results are listed in Appendix 3A-3D and shown graphically in Figures 3-6 generated using Isoplot (Ludwig, 2005). Dates illustrated in LA-ICPMS probability plots use only analyses that are within a 20% discordance threshold, positive or negative, based on calculated ^{206}Pb/^{238}U and ^{207}Pb/^{206}Pb dates. The ages illustrated on the plots are ^{206}Pb/^{238}U if the calculated date is <1.0 Ga and ^{207}Pb/^{206}Pb if the calculated date is >1.0 Ga. It is important to note that euhedral, faceted zircons (i.e., least transported) were generally targeted for LA-ICPMS analysis. We recognize the incurred bias severely limits more distal, and older provenance associations. However, the least transported zircons are assumed to represent the youngest, local source and most closely approximate the maximum depositional age of a given unit, which is the focus of this contribution.

U-Pb ages for youngest detrital zircon grains constrain maximum depositional ages for the units. All the samples analyzed posses a dominant youngest LA-ICPMS peak between ca. 600-800 Ma. Each unit of the upper Scout Mountain Member may be no older than the ca. 675 Ma maximum depositional age determined lower in the section (within the green arkosic sandstones draping the lower diamictite, Isakson, 2017), but may be as synchronous with or younger than the youngest detrital analysis, if that analysis is unbiased by Pb-loss, laboratory contamination, or analytical artifact. However, in the case of the reported samples, populations of zircon crystals with LA-ICPMS dates <675 Ma are generally complex with significant dispersion, and were examined with different models to differentiate a robust estimate of crystallization from the effects of Pb-loss and inheritance. A statistical means of assessing outliers and incorporating scatter into sample age uncertainty is the TuffZirc algorithm of Isoplot (Ludwig, 2005). TuffZirc attempts to mitigate age bias resulting from subjective trimming of possible outlier data that, for example, are affected by Pb loss or inheritance. Here we report and compare the youngest LA-ICPMS analysis, the TuffZirc Age calculated from the LA-ICPMS dates <675 Ma, and the subsequent CA-IDTIMS results *for the same crystals*, as three strategies for estimating maximum depositional age.

Five upper diamictite samples (FH-DZ1, 65PL09, 72PL09, 73PL09, and 74PL09), obtained from the north and south side of the Portneuf Narrows, yield generally similar LA-ICPMS patterns. Collectively as a unit, the stratigraphically lower samples yield a TuffZirc Age of 662.70 (+6.01/-15.63) Ma from a coherent group of 18 LA-ICPMS analyses. Sample 65PL09 yields concordant LA-ICPMS analyses (50/59 total) with dominant ~1680-1800, 2400-2600, and 2680 Ma peaks, and a lesser peak centered about ~660 Ma with a single youngest date of 616 ±41 Ma (Figure 3A). Ten CA-IDTIMS analyses, from eight grains, yielded a dominant ~694-700 Ma peak and a single ~683 Ma date (Figure 3B). South Portneuf Narrows sample 72PL09 yielded generally concordant (58/70 total) LA-ICPMS analyses with a comparable ~1640-1800 Ma peak, a lesser 2440-2700 Ma peak, a dominant peak at ~680 Ma with four youngest dates from ~639-

665 Ma (Figure 3C). Fifteen CA-IDTIMS analyses on 9 grains yielded a comparable ~694-700 peak, along with ~705 and 684 Ma peaks, and a single 658.1 ±0.5 Ma date (Figure 3D). Seven grains from sample FH-DZ1 yielded CA-IDTIMS dates between ~680-700 Ma, with a youngest date of 680.43 ± 0.43 Ma.

Both of the samples from the stratified upper beds of the diamictite (73PL09 and 74PL09) yield mostly concordant (61/82 and 33/35 total respectively) LA-ICPMS analyses that are essentially indistinguishable from the underlying diamictite samples (Figures 3E & 3G). Seventeen CA-IDTIMS analyses from 11 grains yielded dates from ~683-687 Ma and a few scattered between ~695 and 702 Ma (Figures 3F & 3H).

Cap-carbonate samples (FH-DZ2 and NFH) possess several detrital zircon populations comparable to those found in the lower diamictite samples. About half of the LA-ICPMS analysis (103/191 total) yielded similar older (~1600-1900 and 2400-2600 Ma) and younger (~600-800 Ma) dominant peaks, along with a lesser, intermediate (~1400-1500 Ma) peak (Figure 4A). The samples possess a youngest LA-ICPMS date of 587 ±28 Ma and a TuffZirc Age of 620.18 (+14.01/-17.06) Ma from a coherent group of 24 analyses. Thirty-four CA-IDTIMS analysis from 27 grains yielded a dominant ~675 Ma peak, a few ~682-686 Ma dates and three dates at 665.41 ±1.99, 663.42 ±0.53, and 613.93 ±0.80 Ma (Figure 4B).

The cap-sandstone and siltstone samples also possess broadly similar detrital zircon patterns. LA-ICPMS analyses from the cap-sandstone (66PL09) and siltstone (67PL09) both yield generally concordant dates (83/91 and 94/141 total, respectively) with similar ~1600-2000 Ma peaks, a more prevalent ~2400-2600 Ma peaks, and dominant ~600-760 Ma peaks (Figures 5A & 5E). Sample 66PL09 possesses a youngest

LA-ICPMS date of 622 ±20 Ma and a Tuffzirc Age of 645.69 (+8.71/-17.09) Ma from a coherent group of 12 analyses. Nineteen CA-IDTIMS analyses from 13 grains yielded a primary ~697-705 Ma peak, along with a few ~686 and ~675 Ma dates (Figure 5B). Sample 67PL09 possesses a single youngest LA-ICPMS date of 580 ±27 Ma and a Tuffzirc Age of 638.04 (+12.57/-10.71) Ma from 35 coherent analyses. Twenty-nine CA-IDTIMS analysis from 23 grains yielded two ~683-687 and ~674-676 Ma peaks (Figure 5F). The total zircon yield from siltstone sample 68PL09 was particularly low and LA-ICPMS analyses are marginally discordant (12/26 total), with 10/12 ranging between ~581-694 Ma (Figure 5C). The sample yields a single youngest LA-ICPMS date of 581 ±27 Ma and a TuffZirc Age of 636.27 (+11.77/-21.89) Ma from a coherent group of eight. Twelve CA-IDTIMS analyses from 10 grains yielded a most confident 675-677 Ma peak and two dates at ~666 and 655 Ma with high error (Figure 5D).

5. Discussion

5.1. *in situ* vs. CA-IDTIMS

Procedures used in this study continue to underscore the need for tandem *in situ* techniques and high-precision CA-IDTIMS analysis to clearly resolve timing of deposits. Various strategies have been employed to determine the maximum depositional age of a given unit, including using the youngest single grain date as well as a variety of statistical algorithms to determine a youngest coherent group (e.g., Dickinson and Gehrels, 2009; Gehrels et al., 2011; Cawood, Hawkensworth, and Dhuime, 2012; An et al., 2016). This section does not cover issues related to natural or induced bias stemming from sample selection, processing, analytic spot selection, etc. Instead, this contribution is intended to highlight issues that, while not particularly new, significantly affect age interpretation in this time and place.

The youngest U-Pb ages of zircon grains in populations of detrital zircons from a given stratigraphic unit are commonly used to constrain the maximum depositional age. Ideally, an investigation yields a youngest sampling of dates that form a coherent cluster (e.g., narrow peak in the probability density function) from which a maximum depositional age may be determined. However, many if not most samples yield a non-coherent population of dates that may require outlier assessment and rejection prior to arriving at a maximum depositional age. Exclusion of analyses may be fairly straightforward where obvious inheritance or Pb-loss from significantly older/younger discordant dates or results with comparatively large errors. Unfortunately for Neoproterozoic investigations, discordance, subtle Pb-loss, or inheritance of only slightly older crystals is difficult to resolve with *in situ* geochronological techniques. Rejection of outliers (i.e., youngest few analysis) or inclusion of excess scatter becomes somewhat subjective for data possessing significant dispersion and poor stratigraphic control. This is particularly problematic if an analytic session yields a low number of apparently coherent or dispersed young dates (i.e., Figures 2A and 2G) as they may be erroneously interpreted as a maximum depositional age.

All of the units analyzed in this study possess dominant youngest LA-ICPMS peaks between ca. 600-800 Ma (Figures 3-5). If the youngest single analyses are considered to represent maximum depositional age, LA-ICPMS results from the (**A**) upper-diamictite, (**B**) cap-carbonate, and (**C**) overlying sand/siltstone sequence would yield respective U-Pb ages of (**A**) 616 ±41 Ma (65PL09), (**B**) 587 ±28 Ma (NFH), (**C**)

622 ±20 Ma (66PL09), (**C**) 581 ±27 Ma (68PL09), and (**C**) 580 ±27 Ma (67PL09). These dates indicate the upper diamictite – cap carbonate – sand/siltstone sequence was likely deposited in the post-Marinoan, Ediacaran Period (635-542 Ma). We recognize that these data sets are complex, possess significant dispersion, and must be more rigorously examined, as these youngest dates may well be outliers. However, simply disregarding a small (or single) population of juvenile dates as outliers may be disconcerting, given the time and expense invested in – or the geological implications of – a sample.

More robust statistical approaches are necessary if few (or single) analyses are considered untenable for maximum age determination. As stated previously, a statistical method used in many U-Pb labs to reject outliers and incorporating scatter is the TuffZirc algorithm in Isoplot (Ludwig, 2005). TuffZirc uses a consistent step-wise rejection criteria for single analyses dispersed from the major mode of the set of analyses, and thus attempts to mitigate age bias resulting from more subjective trimming of potential outlier data that may be affected by subtle amounts of Pb loss or inheritance. Utilizing the TuffZirc algorithm on ≤675 Ma LA-ICPMS results (within their errors) yields maximum depositional ages based upon the youngest cluster of coherent dates: upper diamictite, ca. 662.70 (+6.01/-15.63) Ma; cap-carbonate, ca. 620.18 (+14.01/-17.06) Ma; cap-sandstone, ca. 645.69 (+8.71/-17.09) Ma; overlying siltstones, ca. 638.04 (+12.57/-10.71) Ma, and ca. 636.27 (+11.77/-21.89) Ma (Figure 6). These TuffZirc ages significantly revise the possible Ediacaran interpretation and, instead, places the units within a Marinoan (ca. 655-635 Ma) timeline. A Marinoan interpretation is in accord with previous suggestions for the upper diamictite and overlying units (e.g., Dehler et al., 2011; Petterson et al., 2011; Isakson, 2017), however, the relatively imprecise errors from each Tuffzirc age span the Marinoan and end-Sturtian timeline. Pb-loss or excess scatter may still bias these age estimates.

Unless effects of Pb-loss or scatter cannot be discounted, the use of chemical abrasion and subsequent analysis by ID-TIMS provides a more reliable estimation of maximum depositional age. Subsequent CA-IDTIMS analysis was accomplished on most of the grains included in the TuffZirc calculations. The chemical abrasion technique not only refines the precision of the single crystal dates, but also improves accuracy through removal of domains biased by Pb-loss. The CA-IDTIMS results for all samples show equivalent youngest major peaks of ca. 675 Ma or older (Figure 6). The ca. 675 Ma populations are indistinguishable or older than the ca. 675 Ma population previously determined for the arkosic sandstone (70PL09) lower in the section (Isakson, 2017). The pervasive ca. 675+ Ma CA-IDTIMS signal is ~53-95 My and ~22-55 My older than respective youngest single LA-ICPMS and calculated Tuffzirc age. In sum, depending on method used, interpretations for the upper units place their timing as; **1 –** Ediacaran (single youngest zircon dates), **2 –** likely Marinoan (Tuffzirc ages), or **3 –** clearly post-Sturtian, and likely Marinoan in age (CA-IDTIMS dates).

The divergence in LA-ICPMS and CA-IDTIMS results for the same crystals, with CA-IDTIMS returning consistently older dates, is interpreted to be the result of Pb-loss that is greatly reduced or eliminated by the chemical abrasion pretreatment step. These new data highlights the need for a tandem approach of *in situ* and CA-IDTIMS analytical techniques to accurately place clear age constraints on rocks of this time and place. Caution must be used when attempting to create timelines from data determined primarily from *in situ* techniques, which may not have sufficient resolution to identify subtle Pb-loss that may skew calculated dates.

5.2. Depositional age prediction

The most robust age control for the upper sequence is from the ubiquitous ca. 675 Ma, youngest CA-IDTIMS population in the arkosic sandstones of the middle Scout Mountain member (Isakson, 2017). In addition to the ubiquity of these ~675 Ma zircons throughout the upper Scout Mountain Member, even younger CA-IDTIMS results of ~665, ~663, ~658, and ~613 Ma for zircon grains from the upper diamictite and cap-carbonate also support a Marinoan (~655-635 Ma) model for the timing of deposition for the units. However, the paucity and incongruent nature of the young dates limits a robust determination for the timing of maximum deposition age.

An implicit assumption is that there is a population of zircons that will yield a consistent youngest age by analyzing a large number of zircons. Depending on the complexity of the zircon population, the number needed for a robust age determination is typically between 6 and 20 or so high-precision analyses. The return of only four juvenile results from the 140+ CA-IDTIMS analyses from samples within and above the upper diamictite is clearly disappointing. The dominance of the ~675 Ma signal relative to the few juvenile dates is interpreted to be either a reflection of source proximity and/or a product of sampling bias.

Successful prediction of a juvenile zircon from the Pocatello Formation has a low probability of success, given the ~53-95 My disparity between LA-ICPMS dates and corresponding CA-IDTIMS results or lack of any obvious morphological or geochemical diagnostic feature for the youngest grains. It is possible the most juvenile grains are more distally sourced and simply represent a vanishingly small population within the Pocatello Formation. Thus, it is possible that similar investigations within other purportedly equivalent units to the south and north (e.g., Death Valley, Perry Canyon, Edwardsburg Formation) may prove more fruitful as hypothetical distance to a juvenile source potentially decreases. However, the cost and time-intensive nature associated with CA-IDTIMS analysis may be prohibitive.

Correlation with known volcanic or plutonic rocks that are potential detrital sources may ultimately prove more useful. The ~614 Ma CA-IDTIMS date from this study is anomalously young for known regional sources; less confidence is thus placed in this grain as a constraint on maximum depositional age for the upper diamictite-cap carbonate. However, the ~665, ~663 and ~658 Ma dates are potentially locally sourced to the north, where Lund et al. (2003, 2010) identified intrusive rocks in the Big Creek-Beaverhead range of central Idaho with SHRIMP crystallization ages of 685, 684, 665, 664 Ma, and 651 Ma. It is possible zircons from these igneous bodies have suffered subtle Pb-loss, akin to those in this study, thereby skewing their reported ages slightly. If so, a comparable high-precision investigation into these and other Cryogenian igneous bodies may reveal unique morphological and chemical characteristics that will more clearly discriminate particularly juvenile detrital grains.

5.3. Rift timing

Utilizing stratigraphic thickness-age relations, igneous activity, and changes in lithology and detrital zircon patterns in deposits in Utah, Nevada, and southern Idaho, it has been suggested that early Rodinian rifting in western Laurentia occurred from ca. 720-660 Ma (Yonkee et al., 2014). Deposition of up to 1000 m of siliciclastic strata in southern Idaho and northern Utah are interpreted to record the onset of regional extension between ~720-700 Ma. Further, variation in lithology, thickness, and unconformities provide evidence suggesting syndepositional faulting.

Early uplift and rifting (~700-670 Ma) is reflected in calculated thickness-age curves, varied detrital zircon patterns, young grains from volcanic-bearing strata, and interpreted glacio-eustatic sea level changes from deposition of up to 1000 m of diamictite. Subsequent subsidence is broadly bracketed between ~660-580 Ma, as evidenced by deposition of 2000+ m of mature, distally sourced strata. As such, the suggested ca. 720-660 Ma rift event(s) of this investigation should be evident in juvenile grains reflecting regional igneous activity. However, the U-Pb zircon geochronology from the Yonkee et al. (2014) study were completed using *in situ* analytic techniques that, as previously illustrated, lack the precision to clearly identify juvenile grains.

Age components within 45 CA-IDTIMS analyses from deposits of the Cryogenian Pocatello Formation appear to indicate protracted volcanism from ca. 709-685 Ma (Keeley et al., 2013, Figure 6), supporting the ca. 720-660 Ma timing of rifting. Combining the results from Keeley et al. (2013) with the 179 CA-IDTIMS results from Isakson (2017) and this study reveal a more punctuated pattern. The compiled CA-IDTIMS age populations from the Pocatello Formation have principle components at ~705, 698, 686, and 675 Ma with sharp, narrow peaks suggesting punctuated regional magmatism (Figure 6). These principle peaks generally trend downward toward lesser components prior to peaking again. It is possible this 7-12 My cyclic pattern may be indicative of early waxing-waning Rodinian rift magmatism.

Details of regional rift processes have been complicated by younger geologic events, thus reconstruction of events is difficult. The early 7-12 My cycles of magmatism indicated by the detrital record is consistent with episodic, incomplete rift events. Initially strong lithosphere may be weakened by dike intrusion during extension/thinning, and subsequently strengthened as dikes solidified, thereby episodically slowing/reviving extension during symmetric rifting. Alternatively, the cyclic magmatic pattern may also be interpreted to be a product of progressive thinning of the lower plate of a low-angle detachment during an asymmetric-style of rifting (Lund et al., 2010). Yonkee et al. (2014) interpreted the lack of tilted strata in Utah, Nevada and southern Idaho as consistent with symmetric rifting of strong lithosphere. Following the significant early signal of magmatic activity, the paucity of relatively juvenile dates may suggest a significant decrease in regional magmatic activity corresponding with the proposed rift cessation occurring at c. 660 Ma.

6. Conclusions

This study highlights the need for CA-IDTIMS analytic techniques to accurately date detrital zircons of this time and place. Thus this contribution underscores previous work by Condon and Bowring (2011) that emphasizes caution when attempting to correlate dates or create robust timelines from data that may not have sufficient resolution to identify subtle Pb-loss that may skew calculated dates. The tandem in situ-isotope dilution approach pursued in this work takes advantage of the high throughput of LA-ICPMS techniques to screen out youngest samples within a detrital population, and melds it to the higher precision and improved accuracy of CA-IDTIMS analysis by analyzing the same crystal via both techniques.

The ca. 675 Ma detrital zircon age peak and maximum depositional age previously resolved lower in the Scout Mountain Member (Isakson, 2017) is persistent throughout the upper portion of the section. This signal suggests the upper portion of the sequence is significantly younger and likely Marinoan in age. Three juvenile grains – CA-IDTIMS dates of ~665 Ma, ~663 Ma, and 658 Ma potentially sourced from central Idaho plutons – from the upper diamictite and cap-carbonate samples further support a Marinoan glacial origin. While we recognize that three non-overlapping dates out of 140+ analyses are sparse constraints, the juvenile dates do increase the probability that the upper Scout Mountain Member deposits are a product of Marinoan glaciation.

Principle CA-IDTIMS age components determined here, when combined with similar data from Keeley et al. (2013), throughout the Scout Mountain portion of the Pocatello Formation suggest punctuated regional volcanism at ~705, 698, ca. 686, and 675 Ma. These patterns, together with the juvenile (~665, 663, and 658 Ma) grains, support the ~720-660 Ma duration of regional rifting. Collectively, these dates also suggest a 7-12 My initial periodicity in magmatic activity from ~709-675 Ma, followed by a quiescent period. Many of the relatively juvenile dates presented here broadly overlap with known sources to the north that possess intrusive ages of: ~685, 684, 665, 664, and 651 Ma (Lund et al., 2003, 2010). Additional high-precision analysis of these igneous bodies may positively correlate with, and provide a template to clearly identify, additional juvenile grains in the Pocatello Formation and other equivalent regional deposits.

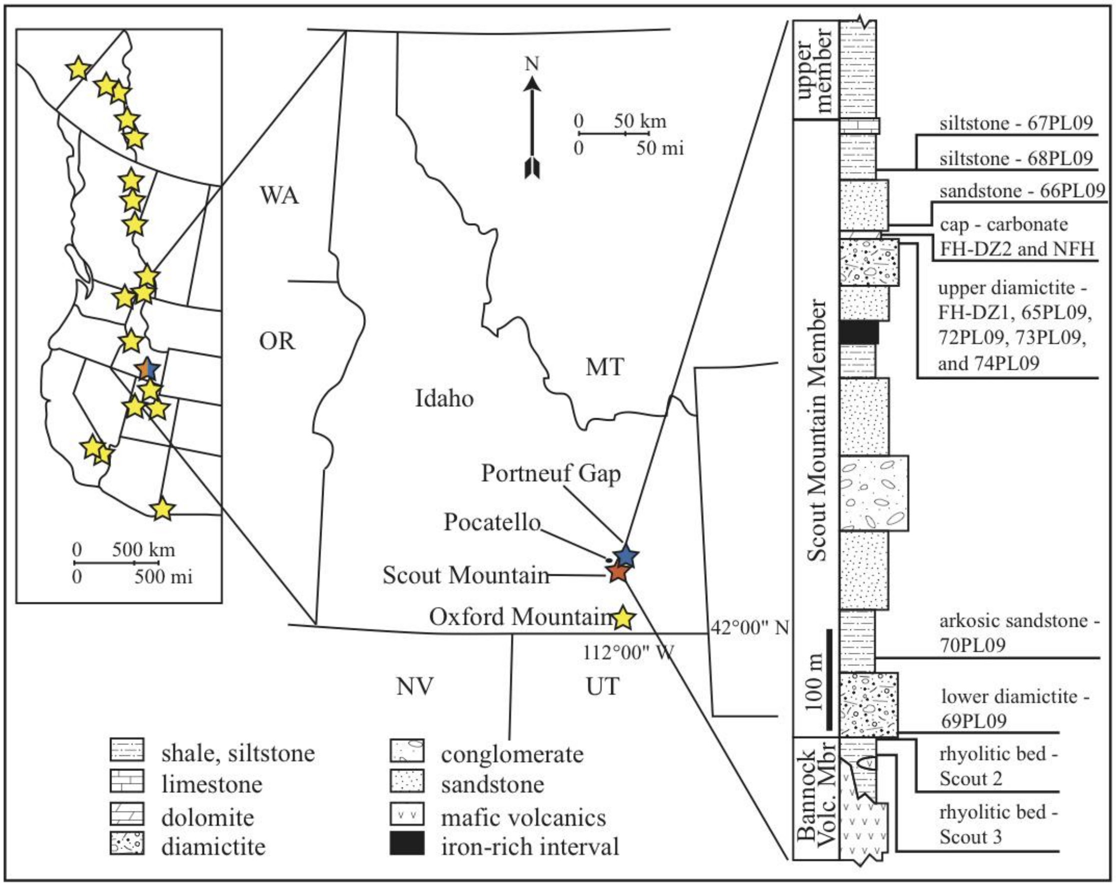

Figure 3.1: Regional maps and general stratigraphic section. Stars on map showing locations of diamictite-bearing successions along the Cordillera, modified from Fanning and Link (2004). General stratigraphic section of Pocatello Formation modified from Dehler et al. (2011) Orange and blue represents igneous and detrital samples, from Scout Mountain and Portneuf Gap respectively, represented in this study.

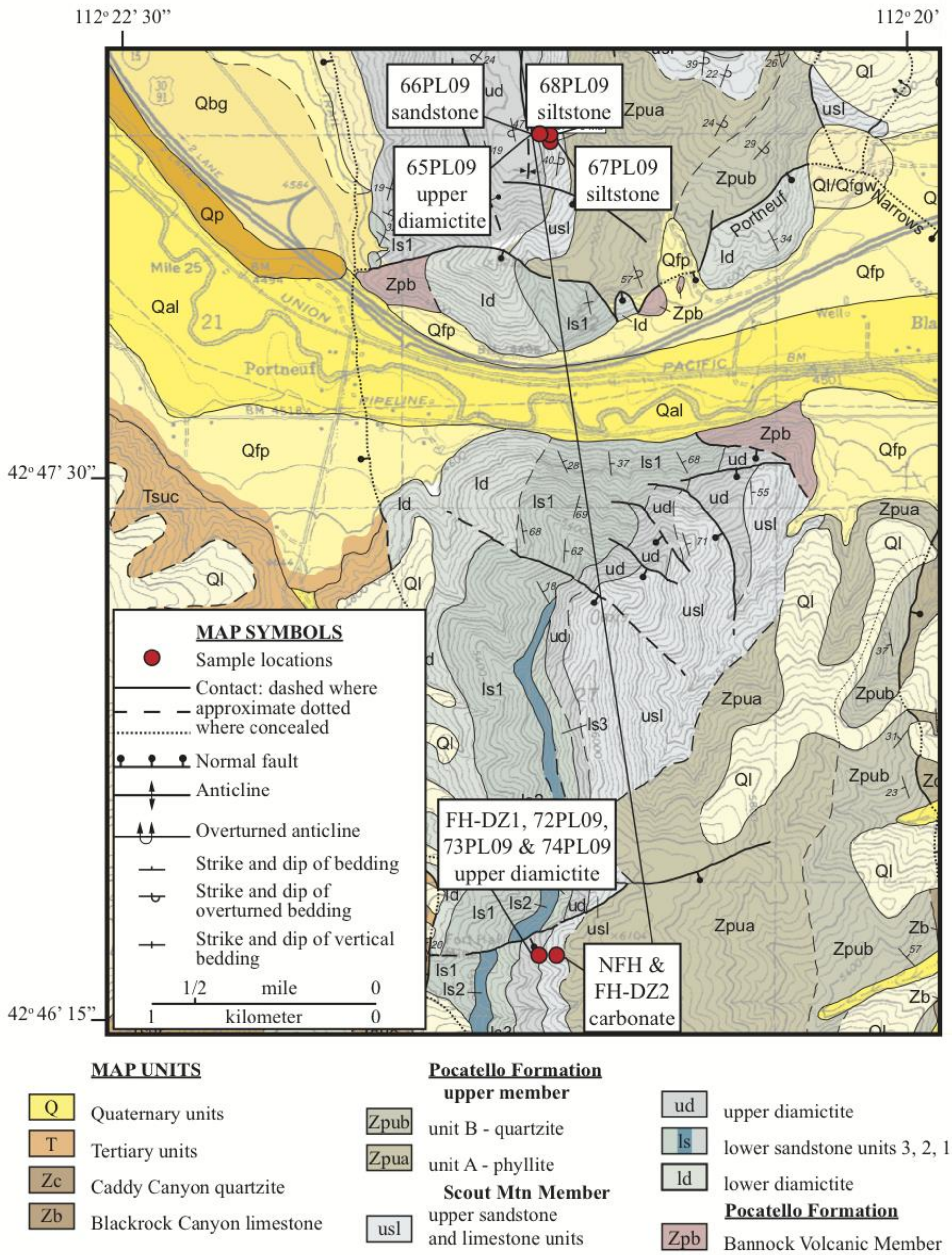

Figure 3.2: Geologic map of the Portneuf Narrows area and sample locations (red circles) from this study. Map modified from Rodgers et al. (2006).

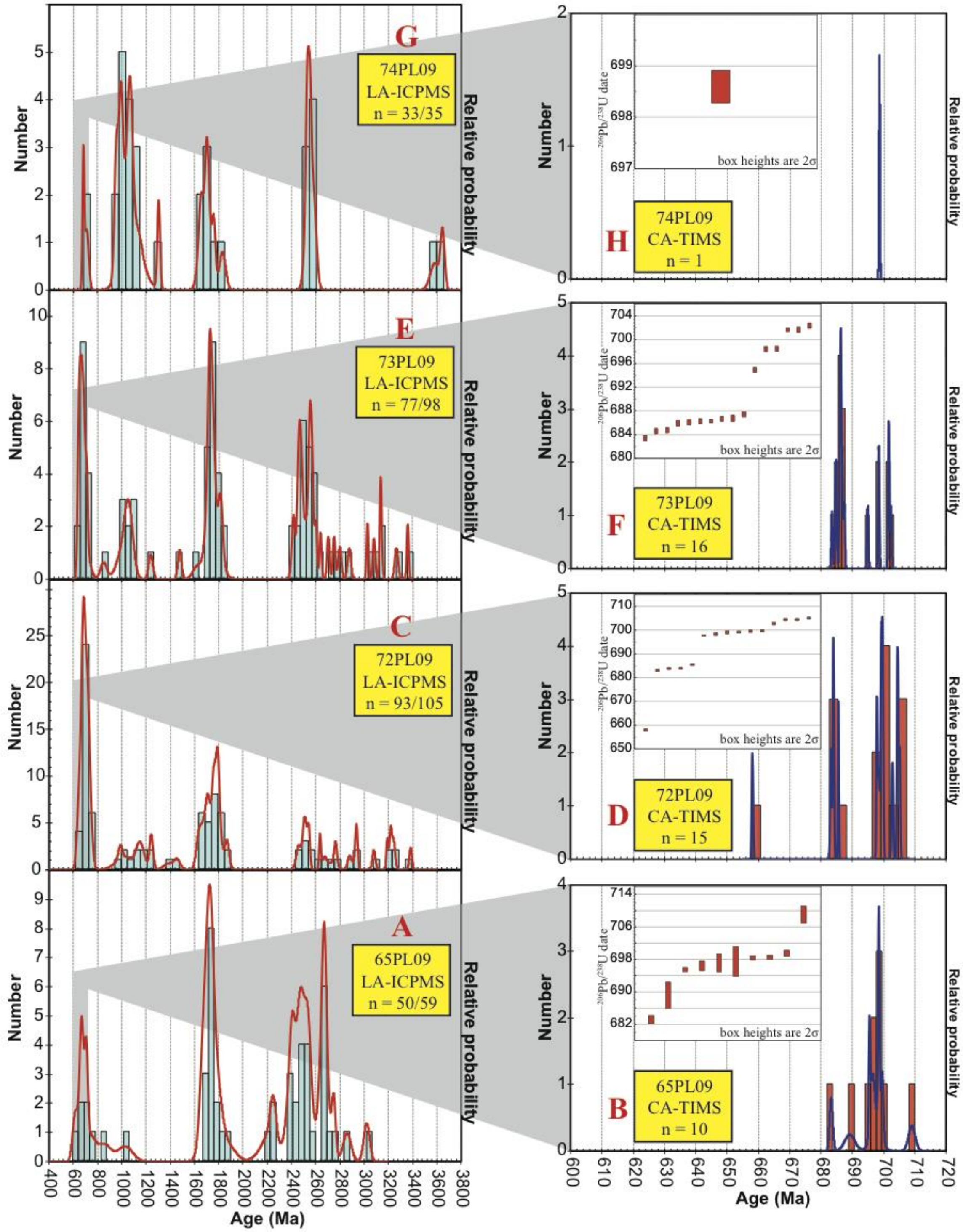

Figure 3.3: Relative probability plots of LA-ICPMS and CA-IDTIMS results for upper diamictite samples. Insets represent ranked age plots of CA-IDTIMS analyses. Probability plots show $^{206}Pb/^{238}U$ < 1000 Ma < $^{207}Pb/^{206}Pb$ zircon dates using ≤20% discordant analyses only. Yellow boxes show number of ≤20% discordant/total number analyses (LA-ICPMS) and total analyses (CA-IDTIMS). Grey shadow illustrates approximate LA-ICPMS population plucked for CA-IDTIMS analysis. A

& B - results for massive diamictite sample 65PL09 from north-side of Portneuf Gap; C & D - results from the highest massive diamictite sample 72PL09, equivalent to 65PL09, taken from south-side Portneuf Gap; E & F - results from the lowermost stratified diamictite sample 73PL09; G & H - results for uppermost laminated diamictite sample 74PL09.

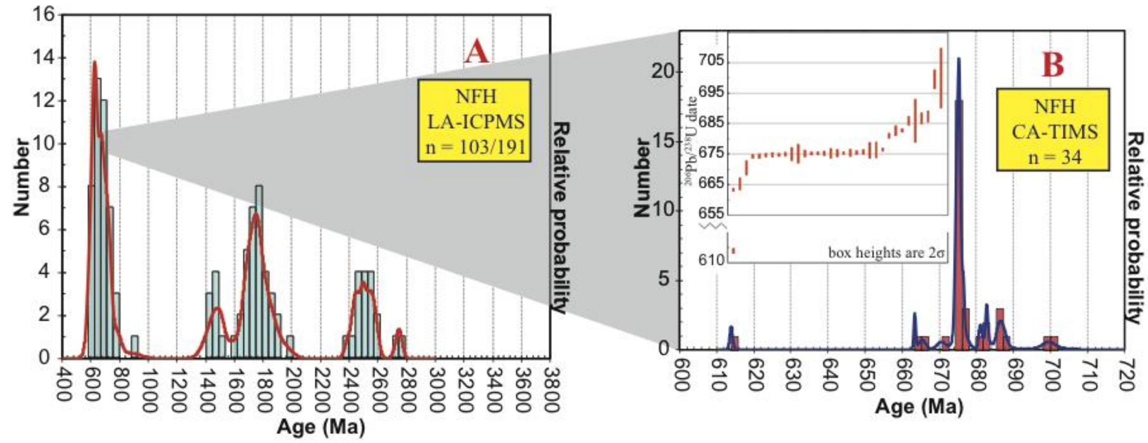

Figure 3.4: Relative probability plots of LA-ICPMS and CA-IDTIMS results for cap-carbonate sample taken from south-side Portneuf Gap. Insets represent tanked age plots for CA-IDTIMS analyses. Probability plots show $^{206}Pb/^{238}U$ < 1000 Ma < $^{207}Pb/^{206}Pb$ zircon calculated dates using ≤20% discordant analyses only. Yellow boxes show number of analyses ≤20% discordant/total number analyses (LA-ICPMS) and total analyses (CA-IDTIMS). Grey shadow illustrates LA-ICPMS population plucked for subsequent CA-IDTIMS analysis. A & B - results for sample NFH.

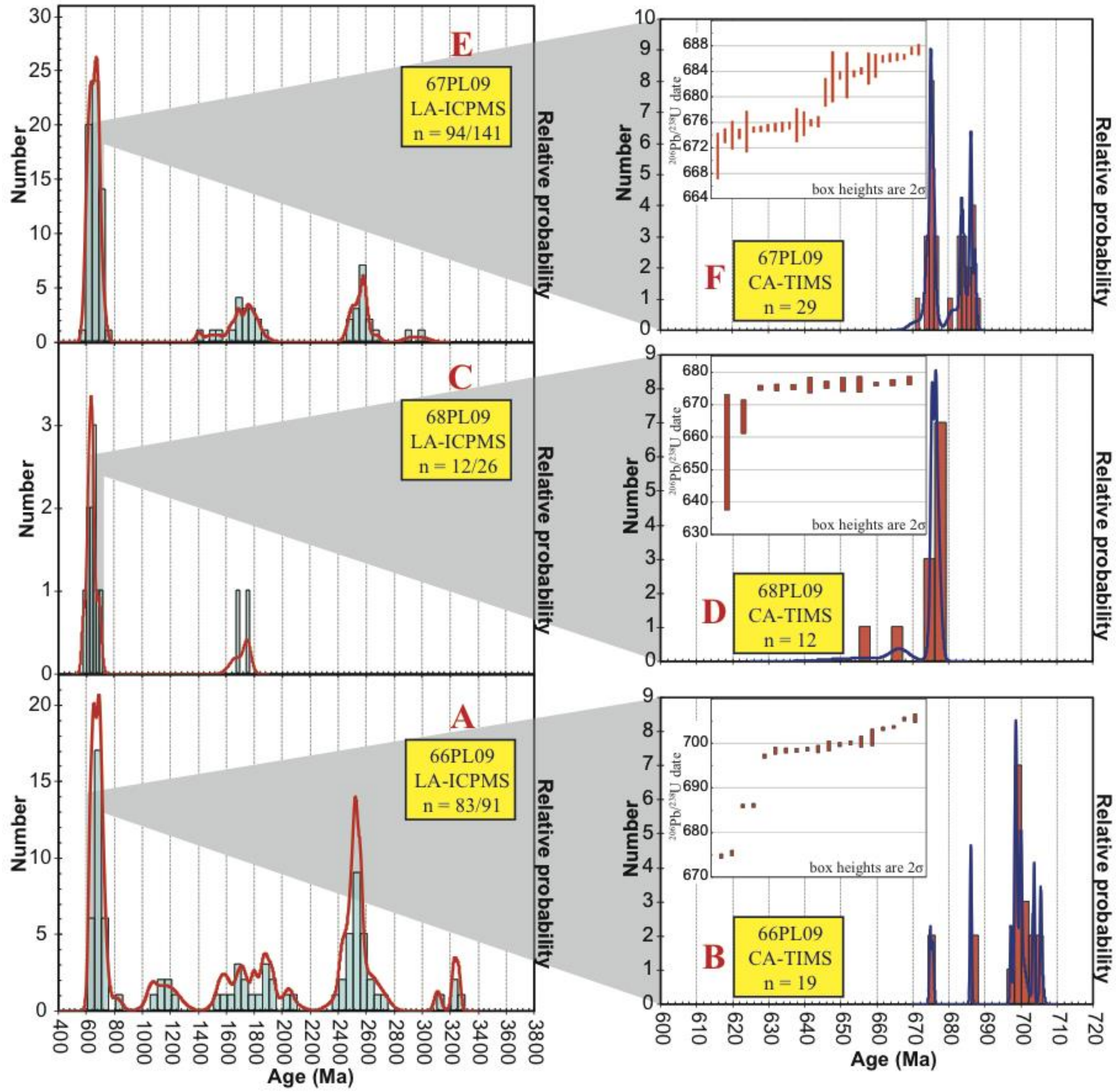

Figure 3.5: Relative probability plots of LA-ICPMS and CA-IDTIMS results for cap sand/siltstone samples from north-side Portneuf Gap. Insets represent ranked age plots for CA-IDTIMS analyses. Probability plots show $^{206}Pb/^{238}U$ < 1000 Ma < $^{207}Pb/^{206}Pb$ zircon calculated dates using ≤20% discordant analyses only. Yellow boxes show number of ≤20% discordant/total number analyses (LA-ICPMS) and total analyses (CA-IDTIMS). Grey shadow illustrates LA-ICPMS population plucked for subsequent CA-IDTIMS analysis. A & B - results for sandstone sample 66PL09; C & D - results for siltstone sample 68PL09; E & F - results from green siltstone sample 67PL09, equivalent to 'reworked fallout tuff' of Fanning and Link (2004).

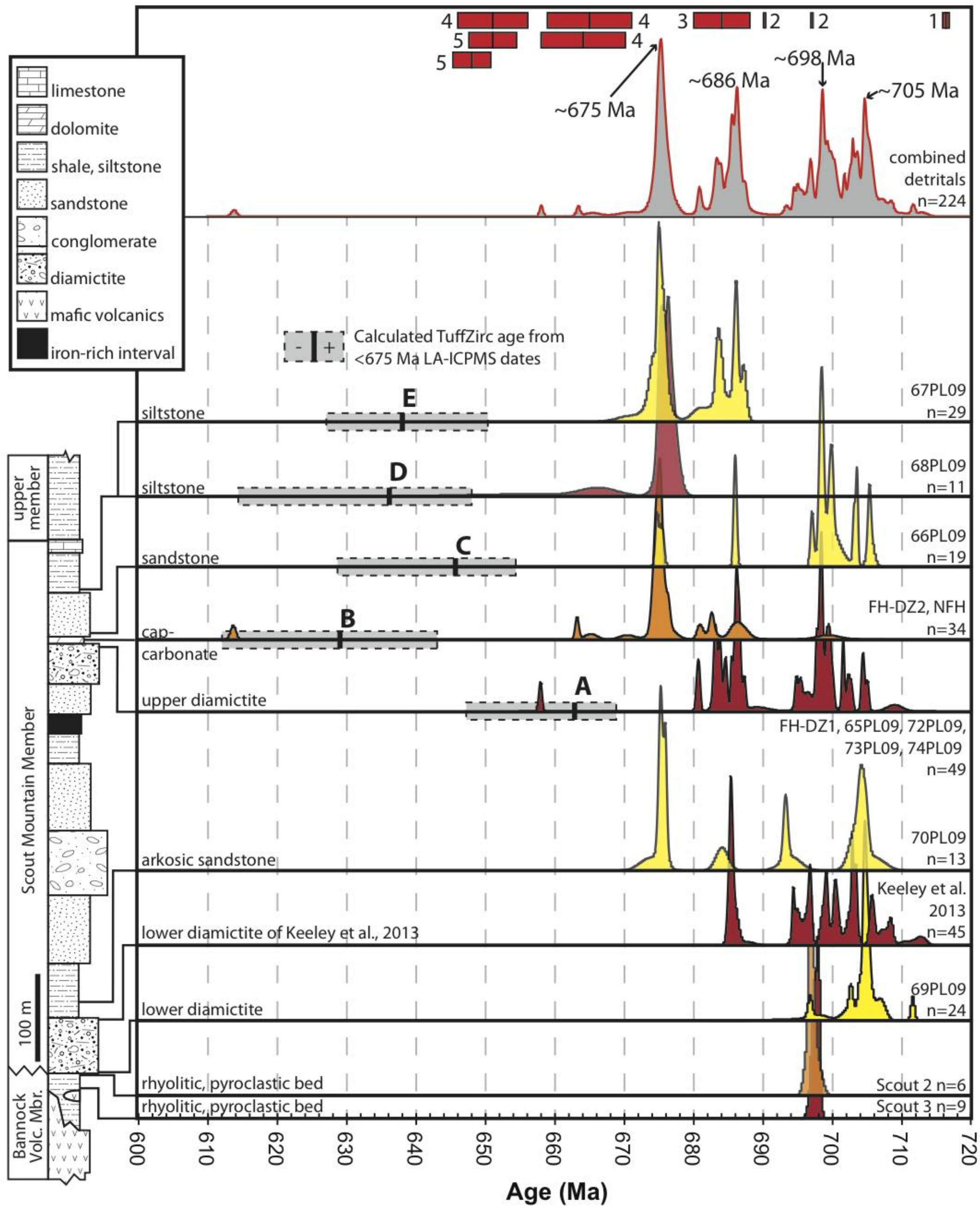

Figure 3.6: Compilation diagram of CA-IDTIMS relative probability plots and Tuffzirc ages (Isoplot, Ludwig 2005) per approximate stratigraphic location. Right - sample I.D. and number CA-IDTIMS analyses (n=#). Calculated Tuffzirc ages - A - 662 (+6/-16) Ma, upper diamictite; B - 620 (+14/-17) Ma, cap-carbonate; C - 646 (+9/-17) Ma, cap-sandstone; D & E - 638 (+13/-11) Ma and 636 (+12/-22) Ma, overlying siltstone samples. Top – Probability plot (grey with red outline) of combined CA-IDTIMS analyses. Red boxes represent Cryogenian igneous dates and error (box

width) 1 - NW Yukon, 716.3 ± 0.54 Ma, Macdonald et al., 2010; 2 - N. British Columbia, 696.2 ± 0.2 and 690.1 ± 0.2 Ma Eyster, A., personal communication; 3 - central Idaho, 684 ± 4 Ma, Lund et al., 2003: 4 - central-east central Idaho, 665 ± 6, 664 ± 6, and 651 ± 5 Ma, Lund et al., 2010; 5 - 650.8 ± 3.4 and 648.2 ± 2.7 Ma, Pigage and Mortensen, 2004.

Table 3.1

Table 1

					Maximum depositional age		
					LA-ICPMS*		
Sample I.D.	location	lithology	Latitude	Longitude	youngest analysis	TuffZirc age [1]	CA-IDTIMS*
67PL09	Portneuf Narrows, north side	green siltstone	389418	4740015	580 ± 27 Ma	638.04 (+12.57/-10.71) Ma	~675 Ma
68PL09	Portneuf Narrows, north side	cm thick green siltstone between grey shales	389427	4740035	581 ± 27 Ma	636.27 (+11.77/-21.89) Ma	~675 Ma
66PL09	Portneuf Narrows, north side	sandstone	389381	4740039	622 ± 20 Ma	645.69 (+8.71/-17.09) Ma	~675 Ma
FH-DZ2 and NFH	Portneuf Narrows, south side	cap-carbonate	389419	4736529	587 ± 28 Ma	620.18 (+14.01/-17.06) Ma	663.42 ± 0.53 Ma
65PL09	Portneuf Narrows, north side	upper diamcitite	389381	4740039	616 ± 41 Ma	662.70 (+6.01/-15.63) Ma	658.1 ± 0.5 Ma
FH-DZ1, 72PL09, 73PL09, and 74PL09	Portneuf Narrows, south side	upper diamicitite	389419	4736529	639 ± 29 Ma (72PL09)		

* $^{206}Pb/^{238}U$ only

[1] calculated from <675 Ma LA-ICPMS analyses using Isoplot (Ludwig, 2005)

7. References

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CHAPTER FOUR

A high-resolution chronology of recurrent Cryogenian magmatism across Idaho and evidence for long-duration, Sturtian glaciation

Abstract

Previous CA-IDTIMS analysis of detrital zircon from the Cryogenian, Scout Mountain Member of the Pocatello Formation predicted a series of punctuated, regional Rodinian rift-related magmatic events from ~709 to 653 Ma (Isakson, 2017c). To test this hypothesis, tandem laser ablation – inductively coupled plasma mass spectrometry (LA-ICPMS) and high-precision CA-IDTIMS analysis have been applied to a series of igneous bodies that form a discontinuous, northwest trending belt of Rodinian rift-related exposures across Idaho. Dating from ten volcanic and plutonic samples reveals diachronous magmatism from 718 to 649 Ma across Idaho that is subtly different from, and complements the detrital zircon record. Further, these dates provide a temporal framework potentially useful for future provenance study of other Cryogenian and younger deposits and piercing points for plate reconstruction. Additionally, CA-IDTIMS dates of 693 and 667 Ma provide evidence for a substantial unconformity within Sturtian deposits that span at least 25 My.

1. Introduction

The geologic history of Proterozoic western North America is fundamentally related to the formation and dissociation of the supercontinent Rodinia. Rodinia was diachronously assembled between ~1300 and 900 Ma (Meert and Torsvik, 2003; Li et al., 2008). Temporal and spatial patterns continue to be debated (Li et al., 2008), but rifting and supercontinent breakup likely occurred in numerous phases. Geologic evidence suggests the onset of rifting along the western margin of Laurentia occurred from ~780-

700 Ma (e.g., Karlstrom et al., 2000; Colpron, Logan and Mortensen, 2002; Harlan et al., 2003; Li et al., 2008; Macdonald et al., 2010). Deposition of syn- and post-glacial and marine sedimentary rocks, along with interbedded rift-related volcanic rocks, mark the ensuing transition to drift and associated thermal subsidence along the passive Laurentian margin from the late Neoproterozoic through Cambrian time (e.g., Bond, Nickelson, and Kominz, 1984; Levy and Christi-Blick, 1991; Ross, 1991; Colpron et al., 2002; Balgord et al., 2013; Yonkee et al., 2014).

Magmatic evidence for Rodinian rifting in western Laurentia is limited and widely separated, occurring as bimodal mafic and felsic volcanic and plutonic rocks scattered along the Canadian and North American Cordillera, with ages ranging from ~780-720 Ma (e.g., Evenchick, Parrish, and Gabrielse, 1984; Parrish and Scammell, 1988; Jefferson and Parrish, 1989; Scammell and Brown, 1990; McDonough and Parrish, 1991; Karlstrom et al., 2000). Early rifting events are interpreted to represent regionally limited extension, resulting in a series of disconnected sub-basins (Lund, 2008 and references therein). Subsequent Cryogenian extension in western Laurentia, along then-interconnected basins, is marked by rare felsic magmatism and associated detritus broadly correlated with the Windermere Supergroup (Lund, 2008 and references therein).

Initial rifting and associated sedimentation is best constrained by the high-precision, chemical abrasion-isotope dilution thermal ionization mass spectrometry (CA-IDTIMS) dates of ~717 Ma for the Mount Harper Volcanics and tuff beds in the ensuing Eagle Creek Formation in the Ogilvie Mountains of the Yukon, coeval with the intrusion of the Franklin large igneous province in northwest Canada (Macdonald et al., 2010). Farther to the south, the timing of rifting along western Laurentia possesses significant uncertainty, likely occurring as multiple stages with final rifting and transition to drift having happened by ~550 Ma (e.g., Burchfiel and Davis, 1975; Bond et al., 1984; Colpron et al., 2002; Lund, 2008; Balgord et al., 2013; Yonkee et al., 2014). An upper intercept date of ~726 Ma was determined for the House Mountain gneiss complex of south-central Idaho (Alexander, 2007). In northern British Columbia, the 696-690 Ma (CA-IDTIMS), bimodal Gataga volcanic rocks are considered to represent continued rifting (Ferri et al., 1999; Eyster et al., 2017 in press). Comparable ~697-692 Ma (SHRIMP) dates are also found in Pioneer Mountains of south-central Idaho (Link and Christie-Blick, 2011; Link, Vogle, and Foster, 2014). In southeastern Yukon, Pigage and Mortensen (2004) determined a cluster of 650-640 Ma dates (air abrasion prior to IDTIMS) for a suite of syn-rift, alkaline intrusive rocks. Similarly, in central Idaho, Lund et al. (2003, 2010) identified volcanic rock, tuffaceous diamictite, and a suite of alkalic plutons thought to represent discrete, Rodinian rift-related, magmatic pulses at ~685, 665-650, and 500-485 Ma via sensitive high-resolution ion microprobe (SHRIMP) analyses. Given the paucity of dateable igneous bodies, reliance on the detrital record to quantify Rodinian rift and related events becomes necessary.

Sediments of the Windermere Supergroup were deposited from ~780-570 Ma during rifting and transition to drift phases along the western Laurentian margin (e.g., Stewart, 1972; Eisbacher, 1981; Devlin, Brueckner, and Bond, 1988; Scammell and Brown, 1990; Ross, 1991). Zircon ages within Windermere sensu stricto, Windermere-equivalent, and younger deposits from Idaho, Utah, and Nevada have been used to constrain and better understand temporal patterns of sedimentation, timing of Snowball Earth-type glaciation, and the onset of alkalic magmatism related to western Laurentian rifting (Lund et al., 2003, 2010; Fanning and Link, 2004, 2008; Keeley et al., 2013; Balgord et al., 2013; Yonkee et al., 2014; Isakson, 2017a, b, c). However, disparate interpretations of results from different analytical techniques and chronometers have raised questions regarding the validity and interpretation of many of the reported ages (e.g., Hoffman and Li, 2009; Macdonald et al., 2010; Condon and Bowring, 2011; Petterson et al., 2011; Spence,, Le Geron, and Fairchild, 2016; Isakson, 2017, b, and c).

High precision age determinations within Windermere and associated deposits are, so far, limited. In southern British Columbia and central to southern Idaho, CA-IDTIMS and SHRIMP analyses of zircon grains from metasediments and diamictite bearing strata reveal complex populations indicative of punctuated volcanism between ~709-663 Ma. In the northern Monashee Mountains, Theny (2016) identified young zircon populations of ~682, 673, and 663 Ma (CA-IDTIMS) within Windermere Supergroup deposits. Trace element chemical patterns in these zircons, determined via laser ablation-inductively couple plasma mass spectrometry (LA-ICPMS), were interpreted to have originated from anorogenic magmas, potentially sourced from central Idaho. In southern Idaho, SHRIMP and CA-IDTIMS analyses reveal more complex age components of ~709, 702, 700, 695, 690, and 685 Ma from diamictite bearing strata interpreted to indicate prolonged regional volcanism (Keeley et al., 2013). Similarly, principle CA-IDTIMS age components of ~705, 698, 686, and 675 Ma, along with lesser intermediate and subsequent peaks to ~653 Ma, from the Pocatello Formation predict more extensive regional volcanism suggestive of a 7-12 My periodicity (Isakson, 2017c).

Portions of these age components favorably compare with, and are potentially sourced from Rodinian rift-related intrusive rocks of central Idaho as SHRIMP crystallization ages of ~684, 665, 664, and 651 Ma (Lund et al., 2003, 2010) broadly overlap. It has been documented that Cryogenian detrital deposits in both central and southeastern Idaho have experienced variable levels of Pb-loss, thereby biasing their apparent LA-ICPMS and SHRIMP ages by 30-90 My (Keeley et al., 2013; Isakson, 2017a, b, c). It is possible that zircons within the correlative intrusive rocks of central Idaho have experienced similar Pb-loss and their purported ages are similarly artificially young.

To explore the relationship between rifting and magmatism on the western margin of Laurentia, we present new geochronology for Cryogenian igneous rocks located across Idaho to: 1) more precisely determine timing of eruption and/or emplacement, 2) clarify the number and timing of Cryogenian magmatic events across Idaho, 3) test the hypothesis that high-precision detrital data from the Pocatello Formation are fundamentally related to, and sourced from, magmatic deposits in central Idaho, 4) further support a long-duration Sturtian glacial episode, and 5) provide a temporal framework for future provenance study and correlation of related units. To further constrain the timing of emplacement, we utilize tandem LA-ICPMS and CA-IDTIMS analytical techniques to reevaluate zircons from the Big Creek-Beaverhead plutonic belt and tuffaceous matrix-supported diamictite in the Daugherty Gulch bore hole from central Idaho, previously reported by Lund et al., (2003 and 2010). Additionally, we present new data from a Cryogenian orthogneiss in northern Idaho, an additional syenite from the southern Big Creek-Beaverhead belt, and a rhyolite clast from the upper diamictite of the Pocatello Formation in southern Idaho. Along with previously reported rhyolitic flows in southern Idaho (Isakson, 2017b), these dates collectively refine and extend the record of punctuated Cryogenian magmatism across Idaho from ~697 Ma to 649 Ma.

2. Methods

Zircon for U-Pb dating was obtained from both mineral separates received from the USGS and our own field sampling. USGS mineral separates are from the greater Big Creek-Beaverhead belt of central Idaho, previously reported in Lund et al., (2003, 2010) as tuffaceous matrix within diamictite of the drill hole of Daugherty Gulch (DG-1), and the Acorn Butte (3KE043), Rush Creek Point (3KE044), and Ramey Ridge (2KE085A) plutons (Figure 1).

Zircons were separated from field samples using standard gravimetric and magnetic mineral separation techniques. Zircons from both field samples and those acquired from the USGS were annealed at 900°C for approximately 60 hr, mounted in epoxy, polished until the centers of grains were exposed, carbon coated and imaged by cathodoluminescence (CL) on a scanning electron microscope. CL images were used to identify internal zircon features and morphological traits to determine preferred spot locations for U-Pb and trace element LA-ICPMS using a New Wave UP213 laser coupled to an X-Series 2 quadrapole mass spectrometer. Laser beam diameter was typically 25μm. LA-ICPMS data were reduced using in house software, and used to identify targets for TIMS analysis.

Individual results are listed in Table 1, Appendix 4A-4D and shown graphically in Figures 2-11, generated using Isopolot (Ludwig, 2005). Analyses were evaluated for consistent, time-resolved $^{206}Pb/^{238}U$, Zr, P, and Ti. Analyses were rejected for evidence that the laser overlapped multiple age domains, intersected cracks or Pb-rich inclusions, or burnt through; irregular or inconsistent data were rejected. Chemical composition data were rejected when evidence indicated the laser pit intersected P or Ti-rich inclusions. LA-ICPMS data yields a spread in generally discordant U-Pb dates in most samples. The wide range in dates limits the confidence in calculated weighted mean ages without a low threshold of percent-discordance cut off. Thus, LA-ICPMS data reported here primarily utilize analyses with ≤10% discordance unless otherwise noted.

Following LA-ICPMS, selected grains were plucked from the epoxy and variably chemically abraded with concentrated hydrofluoric acid following a modified version of Mattinson (2005) to progressively remove damaged regions that have experienced Pb-loss. The Hogback Rhyolite, sample 15VI003, possessed variably developed grain overgrowths that were removed using a physical air-abrasion technique (Krogh, 1982), prior to chemical abrasion. Zircons were spiked with an EARTHTIME mixed ^{205}Pb-^{233}U-^{235}U tracer solution (ET535) and dissolved. U and Pb were separated from solution via ion chromatography following a modified version of Krogh (1973), loaded onto rhenium filaments prior to U-Pb TIMS analysis using IsoprobeX Isoprobe-T and Phoenix X62 multicollector TIMS instruments, both equipped with an ion-counting Daly detector and nine Faraday cups.

3. Samples and U-Pb Results

Field samples SMM08-1SG, Scout 3, and Scout 2 were collected from the Scout Mountain Member of the Pocatello Formation in southeast Idaho. Sample SMM08-1SG is a volcanic rhyolite clast collected within the upper diamictite unit of the Scout Mountain Member on the south side of Portneuf Narrows, east of Pocatello in southeast

Idaho (Figure 1). CA-IDTIMS results yield a weighted mean date of 718.23 ±0.25 Ma from four of five grains (Figure 2).

Two rhyolitic, pyroclastic samples (Scout 3 and Scout 2) were collected near the base of Scout Mountain and previously reported in Isakson (2017b) (Figure 1). Zircons from separates are generally euhedral, sector zoned, and CL bright. LA-ICPMS U-Pb dates range from ~770-580 Ma that yield irresolvable older (659 ±11 Ma, Scout 2) over younger (647.1 ±7.6 Ma, Scout 3) weighted mean ages for analyses with ≤20% discordance (23/35 total Scout 2; 65/72 total Scout 3). More stringent evaluation of the data, utilizing ≤10% discordance only (13/35 total Scout 2; 32/72 total Scout 3), yields indistinguishable ages (659 ±14 and 656 ±10 Ma) respectively (Figures 3A and 4A).

Initial TIMS results from a set of grains from samples Scout 2 and Scout 3 without chemical abrasion pretreatment also yield scattered and discordant U-Pb dates (~693-624 Ma) roughly defining a Pb-loss trend (Figures 3C and 4C). CA-IDTIMS analysis using a pretreatment chemical abrasion step at 180°C yield a relatively narrow spread of more concordant U-Pb dates ranging from ~700-677 Ma. A third round of CA-IDTIMS analysis using more aggressive chemical abrasion at 200°C yielded more consistent dates that, when combined with comparable dates from the 180°C abrasion round, returned weighted mean U-Pb dates of 697.1 ±0.28 and 697.8 ±0.18 Ma for the two samples (Figures 3B and 4B).

Elevating chemical abrasion temperatures by 20°C increases the dissolution rate markedly and was required to remove Pb-loss domains in sampled zircons. However, the increased dissolution also equates to a significant reduction in Pb available for analysis, consequently increasing error within a given measurement. Thus, in an effort to increase concordance, while limiting increased error due to low Pb levels, an intermediate temperature of 190°C was selected for the remaining samples unless otherwise noted.

Field sample 15VI003 is from the Hogback Rhyolite Member of the Edwardsburg Formation of central Idaho (Figure 1). The sample was collected from Hogback Ridge just east of the Big Creek airstrip, at the site of sample 97KE074 (SHRIMP age of 684 ±6 Ma) of Lund et al., (2003). LA-ICPMS of 15VI003 yielded a spread in generally concordant (n = 47/58, ≤10% discordant), calculated dates that range between ~722-650 Ma with a weighted mean age of 688.4 ±3.8 Ma, older (Figure 5A), within error of the 684 ±4 Ma reported by Lund et al. (2003). CA-IDTIMS analysis of five zircons (z1-z5) yielded a spread in discordant U-Pb dates between ~690 Ma and 605 Ma that form a discordia chord with an upper intercept age at ~692 Ma. The significant spread in discordant dates, despite chemical abrasion, is typically the result of mixed age domains.

Closer inspection of CL images revealed subtle overgrowths and healed fractures not obvious from initial LA-ICPMS analysis. The general blocky morphology of the zircons matched the description of Lund et al. (2003), however only some grains were relatively pristine, with many having small, healed cracks and/or very thin, bright overgrowths. Six whole grains from the mineral separates were air abraded prior to chemical abrasion in an attempt to remove any younger surficial domains. Additionally, a few grains were more carefully selected, avoiding any sign of overgrowth, and plucked from the grain mount in an attempt to reduce discordance. While overall concordance was markedly improved, CA-IDTIMS analyses still yielded a spread of U-Pb dates from ~692 to ~675 Ma. However, 15 of the 20 analyses (from 14 total grains) yield an upper intercept of 694.0 ±1.6 Ma (Figure 5C), that agrees with a weighted mean $^{207}Pb/^{207}Pb$

date of 693.03 ±0.73 Ma. This interpreted age is older than the 684 ±6 Ma age of Lund et al. (2003).

USGS zircon mineral separate DG-1 is from the tuffaceous matrix of the diamictite of Daugherty Gulch, near Challis in east-central Idaho, reported by Lund et al., (2010) (Figure 1). Most of the zircons are euhedral, blocky, and show oscillatory or sector zoning, but many are relatively CL-dark and rounded, indicative of an older, detrital population. Seventy-two of 138 LA-ICPMS dates are ~1839-1010 Ma. The remaining dates are ~714-611 Ma, with 32 of 66 <1000 Ma dates (≤10% discordant) yielding a low-probability, weighted mean date of 663.5 ±6.3 Ma (Figure 6A), equivalent with the 664 ±6 Ma age from Lund et al., (2010). CA-IDTIMS analyses result in a slight spread in concordant dates, yielding a weighted mean date of 667.8 Ma ±0.22 Ma from five of six analyses (Figure 6B). As the probability of fit (0.022) indicates scatter, presumably due to Pb-loss, more confidence is placed on the $^{207}Pb/^{206}Pb$ date 667.82 ±1.05 Ma (0.359 probability of fit, 1.09 MSWD). This date agrees with the 664 ±6 Ma date of Lund et al. (2010).

Orthogneiss field sample 09RL762 was collected from Paradise Ridge, located south of Moscow Idaho (Figure 1). The unit, located just north of the east-west portion of the Cretaceous Western Idaho Suture Zone, is part of a mixed granodiorite, gneiss, schist, and quartzite group that is variably migmatized and recrystallized. Zircon grains are generally elongate (l/w of 4 to 6; some are blocky) and CL-bright, with little internal structure. LA-ICPMS analysis (n = 84/118, ≤10% discordant) of the orthogneiss (09RL762) yields a semi-continuous spread in U-Pb dates from ~740-506 Ma, resulting in a low confidence weighted mean age of 642.9 ±5.8 Ma (Figure 7A). The ~240 My spread in dates is consistent with metamorphic Pb-loss or recrystallization. CA-IDTIMS yielded a similar array of dates from ~615 to ~496 Ma. Nine of 11 analyses form a chord with a lower intercept at 74 ±17 Ma and an upper intercept at 661.5 ±2.8 Ma from 9 of 11 analyses (Figure 7B). The persistent discordant trend, not reduced or removed by chemical abrasion, and lack of obvious overgrowth or metamorphic features in zircon CL images points toward recrystallization-induced Pb-loss.

USGS mineral separate 3KE043 is from the Acorn Butte suite of central Idaho (Figure 1), previously reported by Lund et al. (2010) as 665 ±6 Ma with younger zircon overgrowths at 638 ±13 Ma. However, no obvious overgrowths or difference in age population were apparent in our CL images or LA-ICPMS results. The zircons are generally sector zoned, with CL-bright interiors and dark exteriors, with a few possessing faint, bright rims or spots. The LA-ICPMS analyses yield a weighted mean age of 639.7 ± 6.1 Ma, from an array of dates ranging from ~668 to 610 Ma (n = 30/54, ≤10% discordant), overlapping with the younger population determined by Lund et al. (2010) (Figure 8A). Despite the relatively small uncertainty associated with the weighted mean date, it was hypothesized that the ~58 Ma spread in individual dates could be indicative of a combination of Pb-loss and inheritance. In an attempt to determine presumed mixing lines between younger and older growth domains, five grains were plucked and broken into pieces for individual analysis. CA-IDTIMS analysis yielded no obvious mixing of domains as nearly all analyses are concordant (Figure 8C). The seven oldest dates are equivalent and yielded a weighted mean date of 652.43 ±0.17 Ma (Figure 8B). The four youngest dates are not used in the age calculation and are considered to be younger due to Pb-loss.

Field sample 01DS-05 of syenite was collected from outcrops of the Acorn Butte suite south of the Taylor Ranch airstrip, near the southeastern limit of the Big Creek-Beaverhead Belt in central Idaho (Figure 1). Most of the zircons are blocky and CL-dark, with many possessing mottled or embayed interior regions. The majority of the LA-ICPMS analyses from 01DS-05 yield discordant results (n = 7/96, ≤10% discordant). Thus, the percent-discordance threshold was increased to include analysis ≤20% discordant. Increasing the threshold increased the number of serviceable analyses to 19, with 11 of them forming a cohesive group with a weighted mean age of 611 ±10 Ma (Figure 9A). The majority of the LA-ICPMS analyses have high U contents (>400 ppm). Because zircon that is U-rich generally are more susceptible to chemical abrasion, resulting in a residual fragment not amenable to analysis, chemical abrasion was initially performed at a lower temperature (180°C for fractions z1-9) and then at higher temperature (190°C for fractions z10-15). Analyses from the 180°C pretreatment yield a range of discordant U-Pb dates from ~648 Ma to ~603 Ma. Analyses from the 190°C pretreatment reduced the spread in dates to ~650-642 Ma, but results are still discordant. Fourteen of the 15 total analyses yielded an upper intercept age of 655.72 ±0.90 Ma (Figure 9C), slightly older than the oldest equivalent group of 11 dates with a weighted mean $^{207}Pb/^{206}Pb$ date of 653.82 ±0.56 Ma (Figure 9B). Despite the challenges of these U-rich grains, we note the similarity in interpreted age with sample 3KE043 from the Acorn Butte suite.

USGS mineral separate samples 03KE044 and 02KE085A, from the Rush Creek Point and Ramey Ridge suites, respectively (Figure 1), were interpreted as essentially coeval with equivalent SHRIMP ages of 651 ±5 Ma (Lund et al., 2010). LA-ICPMS weighted means dates are 651.6 ±4.7 Ma from 03KE044 (n = 43/64, ≤10% discordant) and 638.1 ±3.8 Ma from 02KE085A (n = 41/58, ≤10% discordant) respectively (Figures 10A and 11A). Both samples yielded CA-IDTIMS weighted mean dates of 650.82 ±0.15 Ma from 3KE044 and 649.26 ±0.16 Ma from 2KE085A from a combination of whole and split grains (Figures 10B and 11B). The Rush Creek Point and Ramey Ridge suites are thus closely spaced but discrete intrusions, separated by ~1.5 Ma and are ~2 Ma younger than the Acorn Butte Suite.

4. Discussion

4.1. Constraints on Cryogenian glaciation

The Cryogenian Period (~720-635 Ma) represents a time of extreme climate fluctuation, repeated disturbances of the carbon cycle, breakup of the supercontinent Rodinia, and at least two low-latitude glaciations (e.g., Knoll and Walter, 1992; Hoffman et al., 1998; Hoffman and Schrag, 2002; Fairchild and Kenedy, 2007; Li et al., 2008; Shields-Zhou, Porter, and Halverson, 2016). However, Cryogenian outcrops today are found in relatively remote locations, contain poorly diagnostic fossils, and consist of few volcanic rocks. Thus, reconstruction of regional events (rift timing, evolution of a given margin, etc.) and/or their global synchroneity possess a large amount of uncertainty. At the crux, disparate records of absolute and relative ages within the associated rock record have limited the fundamental understanding of these events. As such, it is vital to establish a highly accurate record for timing of available outcrops. Traditional correlation of Neoproterozoic rocks along the North American Cordillera generally recognizes two phases of Cryogenian diamictites, the older-Sturtian (~720-665 Ma) and younger-Marinoan (~655-635 Ma). Complete sections of Sturtian- and/or Marinoan-related deposits are rare due to erosional and structural omissions and unknown depositional settings and are poorly dated, thereby limiting their correlation.

The Edwardsburg Formation of central Idaho include two, possibly glaciogenic, diamictite-bearing units in the Wind River Meadows and the Placer Creek Members (Figure 12). It is worth noting that the small clast size and lack of obvious striations does not support glacial origin and may instead represent ice-proximal, turbidite deposits. The units' lithology and timing of emplacement do resemble other regional deposits that are interpreted as glacial in origin. The basal Wind River Meadows quartzite is overlain by a matrix-supported, ~135 m thick diamictite with a mostly sand and silt matrix and sparse 1-4 cm clasts (Lewis et al., 2012). Two samples from the Wind River Meadows diamictite (samples BC14-02 and BC14-03) yielded CA-IDTIMS upper intercepts of ~693 Ma from two grains, with the most confident being 692.0 ± 6.2 Ma (Isakson, 2017a). It is worth noting that the upper intercepts are anchored at ~94 Ma, timing of local igneous activity postulated have thermally altered detrital deposits, and individual analyses possess relatively large uncertainties. As such, the deposits may be slightly older than ~693 Ma. The succeeding Golden Cup Member is thick (~700 m) and composed primarily of mafic volcanic flows and mafic volcaniclastic sedimentary rocks.

At the top of the Edwardsburg Formation and overlying the Golden Cup Member, the Placer Creek Member is a relatively thin (0-40 m), matrix-supported diamictite with a volcanogenic matrix and larger (2-8 cm) clasts (Lewis et al., 2012). The diamictite is described as intertongued with and beneath the Hogback Rhyolite Member (Lund et al., 2011), equivalent to sample 15VI003 of this study, which is also in contact with the Golden Cup Member (Lewis et al., 2012). Exposures of the Placer Creek diamictite and the Hogback Rhyolite are limited, however, we did not find evidence of the Placer Creek diamictite and Hogback Rhyolite units intertonguing.

It was anticipated that the Placer Creek diamictite would possess zircons equivalent to the Hogback Rhyolite if the diamictite and rhyolite were coeval (i.e., intertongued), however, LA-ICPMS yielded no grains younger than ~1315 Ma from the diamictite (Isakson, 2017a). CA-IDTIMS of the Hogback Rhyolite (15VI003) yielded a crystallization age of 693.0 ±0.7 Ma. As such, we interpret the Hogback Rhyolite as having formed post-deposition of the diamictite, although a coeval aspect cannot be ruled out, as the tops of the diamictite and rhyolite units is suggestive of an erosional transition to the overlying Moores Station Formation. Regardless, the ~693 Ma age for the Hogback Rhyolite Member places a robust minimum age constraint on the Placer Creek Member diamictite and the Edwardsburg Formation.

The top of the Edwardsburg Formation abruptly transitions to the thick (>600 m, top not exposed) composite unit of the Moores Station Formation that is composed of a fine-grained carbonaceous quartzite, marble, and phyllite. The quartzite yielded a CA-IDTIMS upper intercept of 653.2 ±2.0 Ma (sample 10RL878, Isakson, 2017a). The ~653 Ma maximum depositional age, along with the sharp Edwardsburg-Moores Station transition, is interpreted to represent a significant, ~40 Ma, unconformity. Importantly, a comparably thick (~930 m) section of similar carbonaceous phyllite and carbonate rock were found to overlie the diamictite of Daugherty Gulch from a drill core to the southeast (Lund et al., 2010) (Figure 12).

The drill core is interpreted as an uninterrupted, stratigraphic section cutting down across a phyllitic dolostone (correlated as Upper Cambrian-Lower Ordovician), carbonaceous phyllite (possibly Middle Cambrian), and undated dolomitic marble to the tuffaceous portion of the diamictite of Daugherty Gulch (Lund et al., 2010). It is also worth noting that, as described in Lund et al. (2011), indicators of glacial origin (e.g., faceted or striated clasts and dropstone bedding compaction) are not clearly recognized in the drill core sample from the diamictite of Daugherty Gulch. However, a glaciogenic origin is permissible as lithostratigraphic and geochronological aspects of the drill core bear similarities to other regional sections. Stratigraphic patterns of diamictite followed by fine-grained carbonaceous siliciclastic and carbonate units is similar to stratigraphic successions in the Edwardsburg-Moores Station and Pocatello Formations of central and southeastern Idaho. However, because the drill core did not reach the base of the unit, there is no information for comparison regarding underlying units. The bottom, tuffaceous portion of the diamictite of Daugherty Gulch preserves dipyramidal quartz grains, volcanic chips, and volcanic clasts with relict spherulites indicating deposition of the diamictite was pencontemporaneous with volcanism (Lund et al., 2011).

We interpret the CA-IDTIMS 667 Ma date for the diamictite at Daugherty Gulch (DG-1) as indicative of the age of regional volcanism. However, we recognize this is not without issue and that this date may instead, or more appropriately, represent a maximum depositional age. The mineral separate from the tuffaceous matrix of the diamictite of Daugherty Gulch yielded a generally bimodal LA-ICPMS population with an older population ranging from ~1840 to 1000 Ma, and a younger population between ~715 Ma and 610 Ma. Interpreting the youngest peak, let alone the weighted mean date, of detrital zircon raises significant concerns.

The weighted mean is typically only used when dealing with results from a single igneous population from a presumed single growth event, within analytical uncertainty. Despite age similarity, this method is often not valid for detrital zircons within clastic rock as the zircons cannot be considered to have been definitively derived from a single event. Zircons that have experienced Pb-loss, as most have in this study, further compound the issue. However, uncertainty associated with Pb-loss is mitigated by the chemical abrasion step of the CA-IDTIMS analytic technique, as damaged zones are removed. Additionally, the high analytical precision inherent to IDTIMS approaches that of the timescale over which a population of zircons was generated, as such, multiple, distinct sources should be apparent in the ID-TIMS data. We interpret the equivalent dates yielding the 667 Ma weighted mean date from the matrix of the diamictite at Daugherty Gulch to reflect the age of a volcanic event and therefore provides a firm age constraint for the deposition of the diamictite.

4.2. Sturtian or Marinoan?

Which Cryogenian glacial episode is associated with the diamictite of Daugherty Gulch is unclear. It is notable that the ~667 Ma age for the diamictite of Daugherty Gulch compares with the ~665, 663, and 658 Ma dates from the ‘upper diamictite’ and cap-carbonate units from the Pocatello Formation (Figure 12). The upper diamictite contains a mix of clast types, quartzose, gneissic, granitic, and volcanic, with some facets and glacial striations. The unit is overlain by a 1-20m thick, pink laminated, and variably sandy dolostone, cap-carbonate (Dehler, 2011). The upper diamictite and cap-carbonate units are interpreted as Marinoan stage (Isakson, 2017c) and are thought to unconformably overly a ~400 m sequence of non-glacial strata which, in turn, unconformably overlies a Sturtian 'lower diamictite' (Figure 12). The lower diamictite is a volcaniclastic interval, largely composed of a mix of reworked mafic volcanic clasts, argillite, quartzite, and rare felsic clasts, within a chloritic matrix.

The Daugherty Gulch diamictite is described as having different lithologies representing separate diamictites (Lund et al., 2010). The uppermost few meters, is composed mostly of grit to pebble clasts of quartzite and metasandstone within an unsorted siltite to metasandstone matrix – similar to the Pocatello upper diamictite. The lower-portion, remaining ~72 m of the core, is relatively clast-rich, volcaniclastic diamictite, composed mostly of rhyolite and lesser amounts of quartzite and metasandstone, within a matrix of quartz, lithic fragments, volcanic chips, and carbonaceous material – similar to the Pocatello lower diamictite. The proportion of volcanic to sedimentary clasts increases with core depth, the lowest being the dated, tuffaceous portion. However, there is a distinct lack of an expected, ~400 m intermediate section of non-glacial silt-, sandstone, and/or conglomerate comparable to the non-glacial portion of the Pocatello Formation.

The lack of intermediate non-glacial facies is similar to the upper diamictite of the Pocatello Formation. This, in addition to the comparable ~660 Ma dates, would indicate the diamictite of Daugherty Gulch is from the Marinoan stage and would then predict a Sturtian diamictite below. However, the dominantly volcaniclastic lithology of the Daugherty Gulch diamictite more closely resembles that of the lower diamictite from the Pocatello Formation, thereby indicating an unconformity may exist between the upper (quartz and metasandstone rich) and lower (volcaniclastic rich) portions of the diamictite.

The restricted view provided by the Daugherty Gulch drill core limits lateral and vertical interpretation, thus possible erosional and structural unconformities cannot be ruled out.

As noted earlier, the Daugherty Gulch diamictite may also correlate with the Placer Creek Member diamictite of the Edwardsburg Formation as comparable, thick, marble and phyllite assemblages (Moores Station Formation) overlie them both. The Placer Creek diamictite is generally clast-poor, containing volcanic, quartzite, siltite and calc-silicate clasts, and possesses a volcanogenic matrix (Lewis et al., 2012), broadly similar to the Daugherty Gulch diamictite. Additionally, the abrupt nature of the contact between the ≥693 Ma Placer Creek diamictite and the overlying <653 Ma Moores Station Formation (marble and phyllite assemblage) indicates a ~40 My disconformity exists between the units in the Edwardsburg area. The contact between the diamictite of Daugherty Gulch and the overlying Moores Station Formation is described as fractured but conformable (Lund et al., 2011 and references therein). As such, if an unconformity exists between the lithological upper and lower portions of the Daugherty Gulch diamictite, it is possible that the lower portion may represent the 'missing' (eroded) upper portion of the Placer Creek Member diamictite. If so, the 693 Ma Hogback Rhyolite and the 667 Ma dates bracket the diamictite, indicating the unit was deposited over at least twenty-five million years. This timeline agrees well with a long-lasting, Sturtian glacial epoch between ~717 Ma to 660 Ma (Rooney et al., 2015).

We recognize that due to the incomplete sections and the lack of definitive lithological correlations, the 667 Ma diamictite of Daugherty Gulch may well be a product of the Marinoan stage. However, given the overlying and internal lithological ties, we feel the more conservative interpretation that the lithological lower portion of the

Daugherty Gulch diamictite unit is Sturtian is more likely. This interpretation makes the 667 Ma Daugherty Gulch unit one of the youngest Sturtian diamictites known.

4.3. Timing of magmatism

Most of the *in situ* dates did not agree with the CA-IDTIMS dates (Figure 13). With the exception of the Daugherty Gulch (DG-1) and Rush Creek (03KE044) samples, the LA-ICPMS did not agree with the CA-IDTIMS dates. The SHRIMP data of Lund et al., (2003, 2010) fared only slightly better, similarly overlapping with the Daugherty Gulch, Rush Creek, and Ramey Ridge (02KE085A) samples. We interpret the discrepancy between analytic techniques to primarily be the result of subtle open system behavior and Pb-loss not detected within the relatively high uncertainty inherent to the *in situ* techniques, thereby resulting in a misinterpretation of crystallization ages. This new data highlights the need for CA-IDTIMS analytic techniques to establish robust age constraints for this place and time.

Chemical abrasion pretreatment for the identification of open system behavior is extremely important for these systems. If Pb-loss is the primary source of open-system behavior, it has the effect of lowering the $^{206}Pb/^{238}U$ date on some analyses and consequently lowers the weighted mean date. This artificial lowering of dates is mitigated by the chemical abrasion pretreatment that reduces or eliminates the effects of Pb-loss. Additionally, the higher precision inherent to IDTIMS allows small amounts of Pb-loss to be recognized and excluded from calculation of the weighted mean date, yielding a more robust age determination. Where discordant effects are persistent despite chemical abrasion, the analyses are assumed to possess a mixture of more discrete age domains which should form a line between timing of crystallization and secondary growth or recrystallization. Again, the relatively high resolving power of IDTIMS analyses allows for a robust age determination from the upper intercept chord.

CA-IDTIMS ages determined in this contribution provide high-precision markers for potential Rodinian rift related magmatism across Idaho (Figure 13). The 718.23 ±0.25 Ma date determined for the volcanic clast (SMM08-1SG) within the Pocatello Formation of southeastern Idaho compares with ~719 to 716 Ma dates associated with the Mount Harper Volcanic suite and Franklin large igneous province of northwestern Canada (Macdonald et al., 2010). Assuming the clast is not far traveled these ages could define the extent of coeval early Cryogenian magmatism along the ~4000 km distance spanning the central to northwestern Laurentian margin.

Younger ages determined for the rest of the units highlight the irregular nature of magmatism across Idaho; **1 – southeastern**, 697.78 ±0.18 Ma and 697.05 ±0.28 Ma (Scout 3 and Scout 2, Pocatello Formation); **2 – central**, 693.03 ±0.73 Ma (15VI003, Hogback Rhyolite); **3 – east-central**, 667.76 ±0.52 Ma, (DG-1, Daugherty Gulch); **4 – northwest**, 661.5 ±2.8 Ma (09RL762, Paradise Ridge); **5 – central**, 653.82 ±0.56 Ma (01DS-05, Taylor Ranch, south Big Creek-Beaverhead belt); **6 – central**, 652.43 ±0.17 Ma (3KE043, Acorn Butte suite, west-central Big Creek-Beaverhead belt); **7 – central**, 650.82 ±0.15 Ma (3KE044, Rush Creek Point suite, east-central Big Creek-Beaverhead belt); **8 – central**, 649.26 ±0.16 Ma (02KE085A, Ramey Ridge suite, north Big Creek-Beaverhead belt). This seemingly non-systematic, migrating pattern over time illustrates the complex nature of magmatism associated with rifting in this portion of the Laurentian margin. This activity shows a prominent ~70 My period of magmatism across Idaho from ~718-649 Ma.

4.4. Testing the provenance origins for the Pocatello Formation

Provenance data from detrital zircon CA-IDTIMS of the Pocatello Formation was interpreted to suggest punctuated regional volcanism from principle age peaks at ~705, 698, 686, and 675 Ma, along with lesser intermediate and subsequent peaks as young as ~653 Ma (Isakson, 2017c). It was proposed that many of these age components are regionally sourced to the north as some of the peaks overlap with SHRIMP crystallization ages of ~685 Ma, 684, 665, 664, and 651 Ma purported from igneous deposits in central Idaho (Lund et al., 2003; 2010). However, refined and new CA-IDTIMS data presented here from the same and new igneous rocks across Idaho do not overlap, and instead generally reside between, the principle detrital peaks (Figure 13).

Only a few minor peaks clearly coincide with the timing of igneous activity across Idaho: the proximal ~697 Ma Scout Mountain samples, a single ~693 Ma Hogback rhyolite (15VI003), and possibly a peak just within error of the ~661 Ma Paradise Ridge sample (09RL762). With no major and few lesser detrital peaks overlapping with igneous dates, it is reasonable to conclude that central to northern Idaho was not a significant source of sediment for the Pocatello Formation. We recognize that this does not discount the possibility that 1) currently exposed bodies may not have been sufficiently exposed throughout the 720-635 Ma Cryogenian Period to serve as significant sediment sources, 2) the post-Sturtian deposits may not be significantly younger than ~655 Ma for sufficient exhumation and sedimentation, and 3) there are additional undiscovered igneous bodies with ages corresponding to those found in the Pocatello Formation. The lack of equivalent dates between the detrital and igneous record opens the possibility for undiscovered igneous sources to the east, south, or possibly as a rifted fragment(s) to the west.

4.5. Rift history

Timing and geometry of Rodinian rifting continues to be debated, with different models placing various continental blocks along the western Laurentian margin (Li et al., 2008 and references therein). It is not clear what continent(s) have rifted away from the western margin of Laurentia, but possibilities include: Antactica, Australia, west Africa, and various portions of China (e.g., Moores, 1991; Hoffman, 1991, Dalziel, 1997; Sears and Price, 2003; Li et al., 2008; Evans, 2009; and Fu et al., 2015). The western Laurentian margin has been appreciably modified by younger deformation and accretion, resulting in significant uncertainties regarding plate reconstruction. In addition to improving the resolution of timing and number of magmatic events in the region, these dates may provide piercing points potentially useful for plate reconstruction.

CA-IDTIMS data presented here, along with ~726 Ma (Alexander, 2007) and ~676-692 Ma (Link and Christie-Blick, 2011; Link et al., 2014) show a prominent, at least 70 Ma period of magmatism across Idaho from ~720-649 Ma. In addition to the direct magmatic dates, age components from Cryogenian detrital zircon patterns indicate even more extensive volcanism. The combination of 224 CA-IDTIMS detrital analyses from the Pocatello Formation produce a unique record that further supports protracted rifting between ~720 and 649 Ma. Collectively, these dates are indicative of a cyclic, waxing-waning pattern of magmatism in at least four broad phases: an initial pulse at ~720 Ma, with renewed activity 1) between ~705 Ma and 693 Ma; 2) from ~686 to 681 Ma; 3) episode at ~675, 667, and 661 Ma; and 4) alkaline plutonism followed in the period between ~654 to 649 Ma (Figure 13). It is unclear how this magmatism directly relates to the process of rifting or the identification of what conjugate margin may have been rifted away.

Details of regional rift processes have been complicated by younger geologic events, thus reconstruction of events is difficult. However, the cycles of magmatism are consistent with episodic, incomplete rift event models. In a symmetric-style of rifting, initially strong lithosphere may be weakened by dike intrusion during extension/thinning and subsequently strengthened as dikes solidified, thereby episodically slowing/reviving magmatism during extension. The lack of distinctly tilted strata in Utah, Nevada, and southern Idaho is interpreted as consistent with more symmetric-rifting (Yonkee et al., 2014). Alternatively, cyclic magmatic patterns may also be interpreted to be a product of progressive thinning of a lower-plate and underplating/intrusion forming arches in an upper-plate during an asymmetric-style of rifting (Lister, Etheridge, and Symonds, 1991). Sedimentary basins are created along low-angle detachments as the lower-plate margin thins and subsides across a broad shelf (Figure 14). Underplating the complementary upper-plate limits thinning and effectively forms a topographic high that separates local depositional basins and provides a source for juvenile detritus. This asymmetry may explain seemingly missing detrital sources as the original provenances may have drifted away on conjugate margins.

For example, the detrital record of southeastern Idaho does not possess significant ~665-649 Ma grains clearly correlative with Idaho magmatism. Assuming the magmatic bodies were part of an upper-plate arch and sufficiently exposed, they may have been cut off from the southeast and, instead, shed detritus more toward the west (i.e., the Pocatello

Formation *was not* in communication with igneous bodies of central Idaho). However, diamictite-bearing strata of southeastern Australia does possess ~662-653 Ma dates (Calver et al., 2013) that may correlate as a former lower-plate conjugate depositional basin from central Idaho (southeastern Australia *was* in communication with central Idaho). Similarly, southeastern Idaho may have represented a lower plate conjugate to Antarctic. Neoproterozoic strata in east Antarctica contain abundant Paleo- through Neoproterozoic detrital dates – including one with a prominent ~675 Ma peak – and associated ~668 Ma volcanic rocks (e.g., Goodge et al., 2002; Goodge et al., 2004) that potentially correlate with dates found in the Pocatello Formation and the diamictite of Daugherty Gulch.

5. Conclusions

The 693 and 667 Ma dates for the Hogback Rhyolite and diamictite of Daugherty Gulch place robust age constraints on diamictite-bearing strata in south-central Idaho. These dates support other findings that regional glacigenic strata are younger than other well dated Sturtian diamictite deposits, e.g., the ~716 Ma basal Upper Mount Harper Group in Canada (Macdonald et al., 2010), and the ~711 Ma basal Gubrah Formation in Oman (Bowring et al., 2007). Despite somewhat equivocal lithological correlations across a substantial unconformity, the 693 and 667 Ma dates are indicative that the Sturtian Placer Creek – Daugherty Gulch diamictite was deposited over a period spanning at least 25 My.

CA-IDTIMS results revise previous volcanic and plutonic SHRIMP dates and uncertainties (Lund et al., 2003, 2010) from central Idaho: Hogback Rhyolite from 684 ±4 Ma to 693.03 ±0.73 Ma; tuff of Daugherty Gulch from 664 ± 6 Ma to 667.76 ±0.22

Ma; Acorn Butte suite from 665 ±6 Ma (with younger overgrowths at 638 ±13 Ma) to 652.43 ±0.17 Ma; Rush Creek Point suite from 651 ±5 Ma to 650.82 ±0.15 Ma; and Ramey Ridge Suite from 651 ±5 Ma to 649.26 ±0.16 Ma. Further, the discrepancy in calculated dates between *in situ* and IDTIMS analytic techniques highlight the need for CA-IDTIMS to accurately date deposits of this time and place.

Direct dating of these volcanic bodies, along with four new igneous samples, across Idaho extends Cryogenian magmatism from ~697 to 649 Ma and, by proxy, up to ~720 Ma. The upper ages, correlative with the ~719 to 716 Ma dates associated with the Mount Harper Volcanic suite and Franklin large igneous province of northwestern Canada (Macdonald et al., 2010), potentially link coeval early Cryogenian magmatism in the northwestern and central Laurentian margin. Collectively, dates determined in this study show that magmatism also non-systematically migrated across the region. When combined with other dated bodies across Canada, magmatism appears to have occurred in at least 18 different episodes, spanning at least 70 Ma across western Laurentia.

High-precision igneous ages determined in this study do no match provenance patterns predicted from CA-IDTIMS detrital compilation of Cryogenian deposits from the Pocatello Formation in southeastern Idaho (Isakson, 2017c). These data do not directly support the hypothesis that the deposits can be traced to central Idaho. Alternatively, grains were possibly sourced from undiscovered bodies to the east, south, or, more likely, from rifted fragments. While data presented here are not diagnostic as provenance for local deposits, these high-precision dates may provide piercing points that are potentially correlative with other rifted continental blocks and provide a means to identify former conjugate pieces of the Laurentian margin.

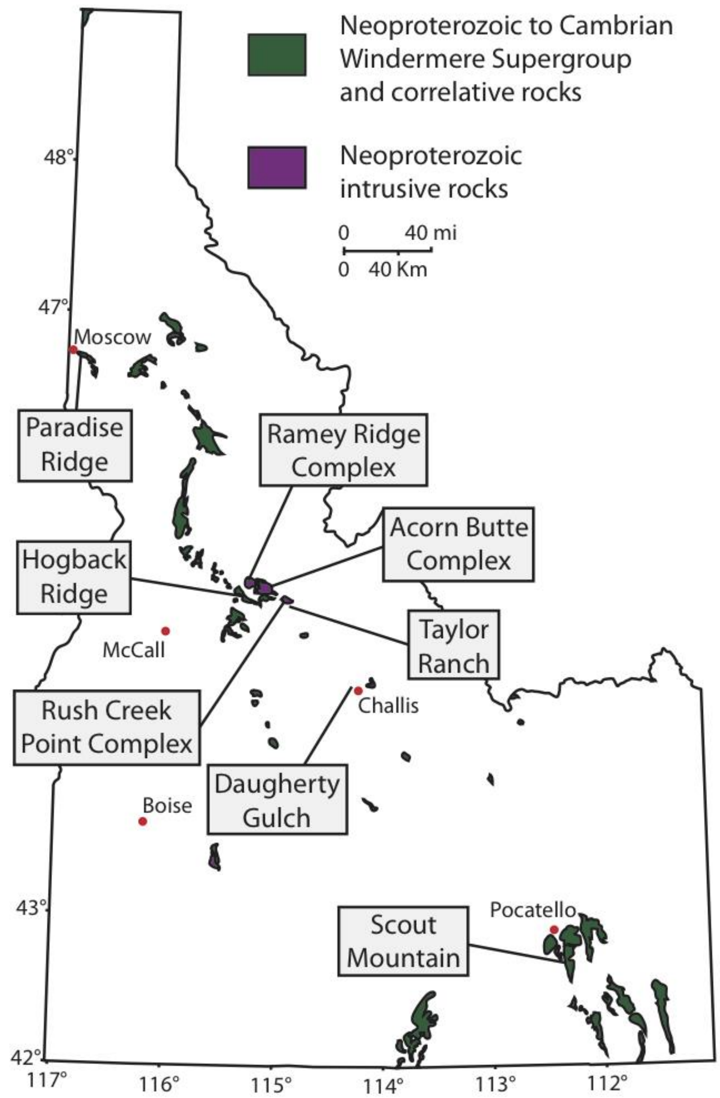


Figure 4.1: **Map of Neoproterozoic through Cambrian rock in Idaho (from Reed et al., 2012b) and general sample location.**

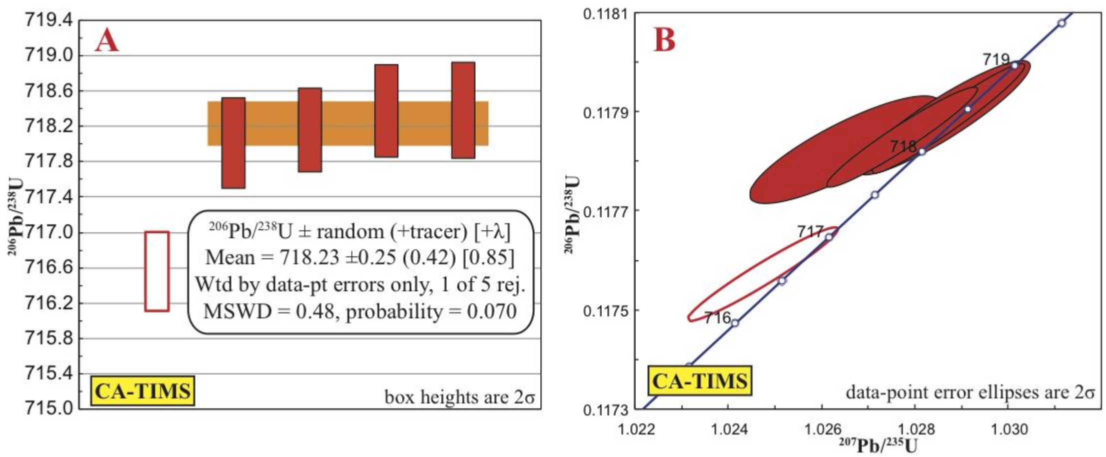


Figure 4.2: CA-IDTIMS results from volcanic clast from cobble conglomerate of the Pocatello Formation, southeast Idaho (sample SMM08-1SG). A - Ranked $^{206}Pb/^{238}U$ weighted mean plot of single zircons from SMM08-1SG. Solid bars represent data used in age calculation. Horizontal orange bar represents calculated mean age and uncertainty. B - Corresponding SMM08-1SG Wetherill Concordia plots for CA-IDTIMS analysis.

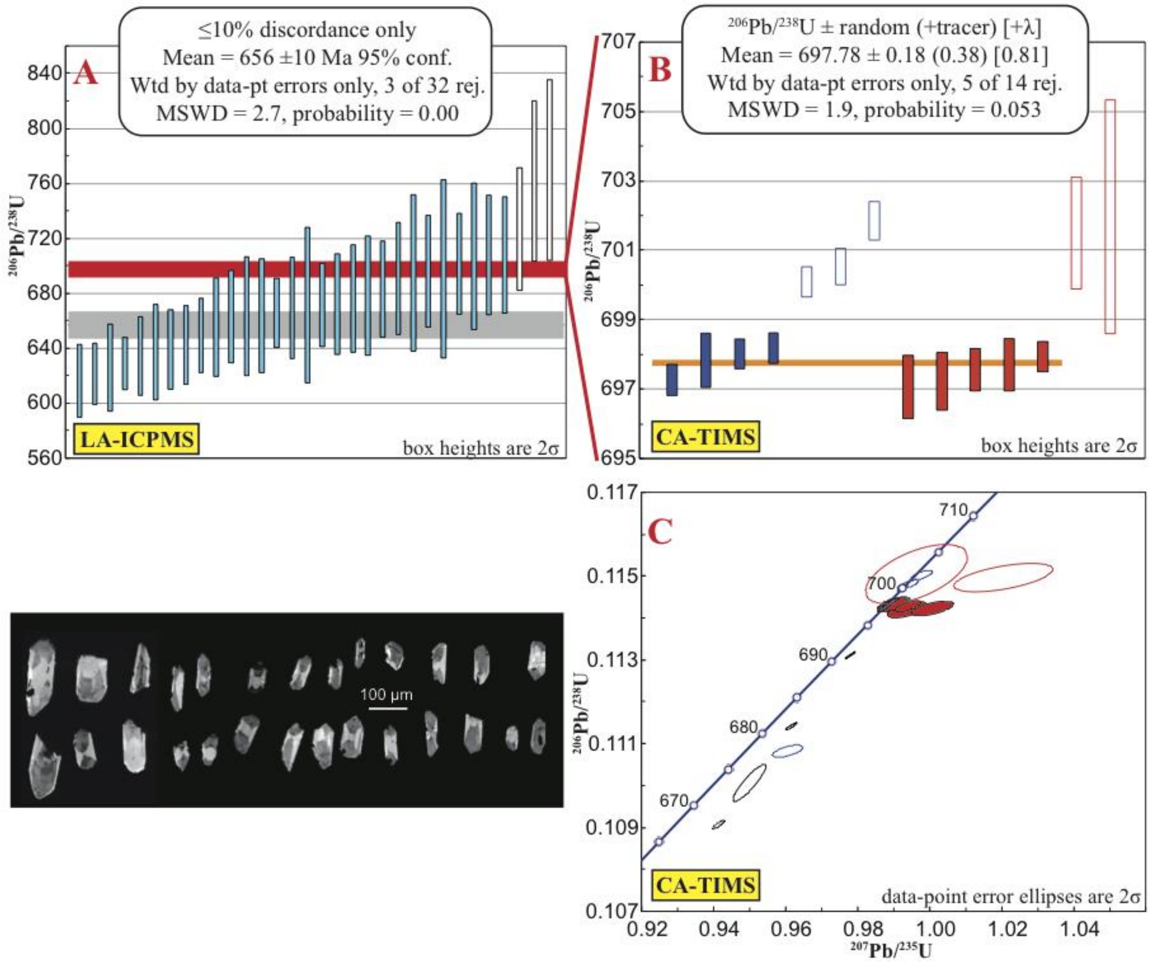


Figure 4.3: Rhyolitic, pyroclastic sample Scout 3: cathodoluminescence image of representative zircons and, A - Ranked $^{206}Pb/^{238}U$ weighted mean plot using only <10% discordant LA-ICPMS analysis. Solid bars represent data used in age calculation. Horizontal grey bar represents calculated mean age and uncertainty. B - Ranked $^{206}Pb/^{238}U$ weighted mean plot for CA-IDTIMS analysis of single zircons from Scout 3. Blue bars represent analysis using 180˚C chemical abrasion and red bars using 200˚C chemical abrasion. Solid bars represent data used in age calculation. Horizontal orange bar represents calculated mean age and uncertainty. C - Scout 3 Wetherill Concordia plots for CA-IDTIMS analysis without chemical abrasion (black), 180˚C chemical abrasion (blue), and 200˚C chemical abrasion (red).

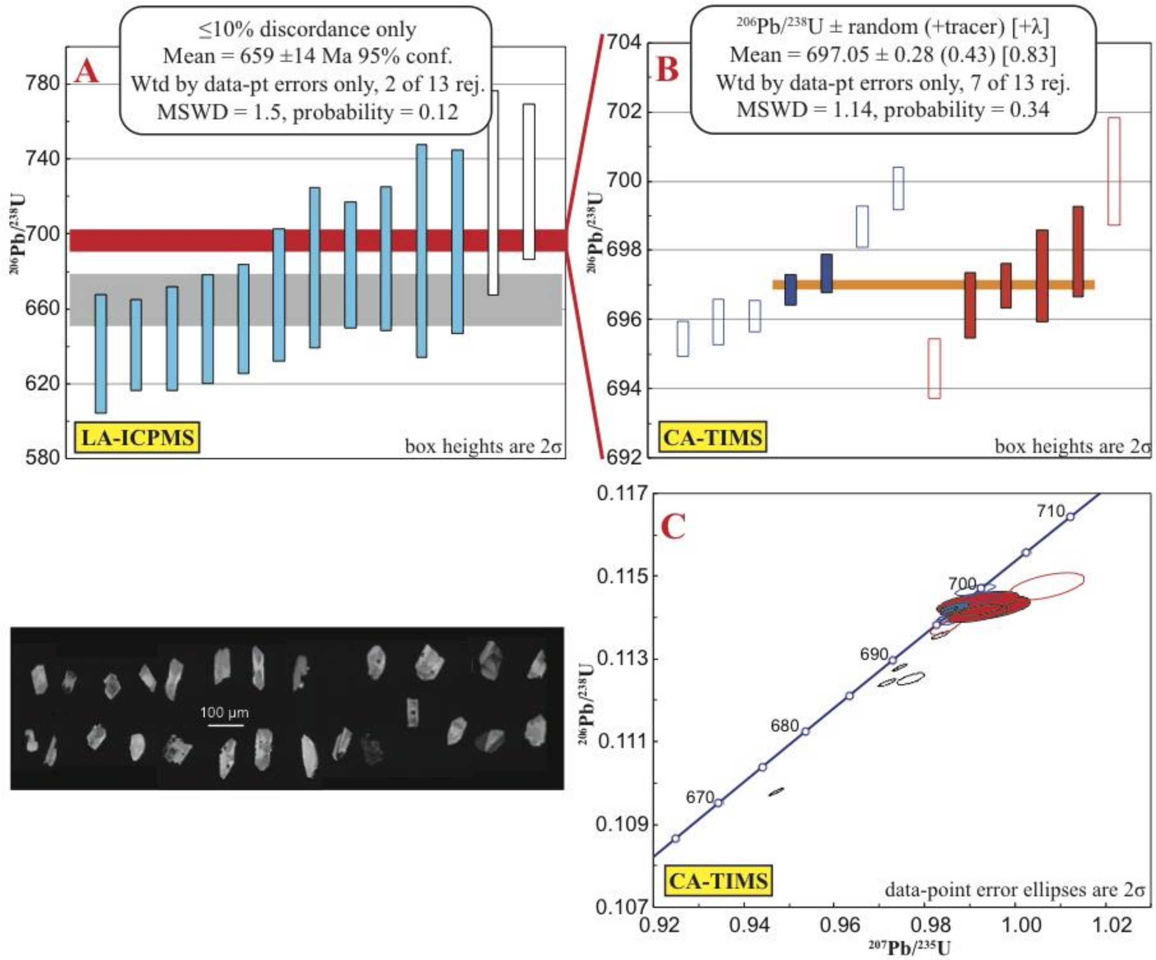


Figure 4.4: Rhyolitic, pyroclastic sample Scout 3: cathodoluminescence image of representative zircons and, A - Ranked ^{206}Pb/2^{38}U weighted mean plot using only <10% discordant LA-ICPMS analysis. Solid bars represent data used in age calculation. Horizontal grey bar represents calculated mean age and uncertainty. B – Ranked ^{206}Pb/^{238}U weighted mean plot for CA-IDTIMS analysis of single zircons from Scout 2. Blue bars represent analysis using 180˚C chemical abrasion and red bars using 200˚C chemical abrasion. Solid bars represent data used in age calculation. Horizontal orange bar represents calculated mean age and uncertainty. C - Scout 2 Wetherill Concordia plots for CA-IDTIMS analysis without chemical abrasion (black), 180˚C chemical abrasion (blue), and 200˚C chemical abrasion (red).

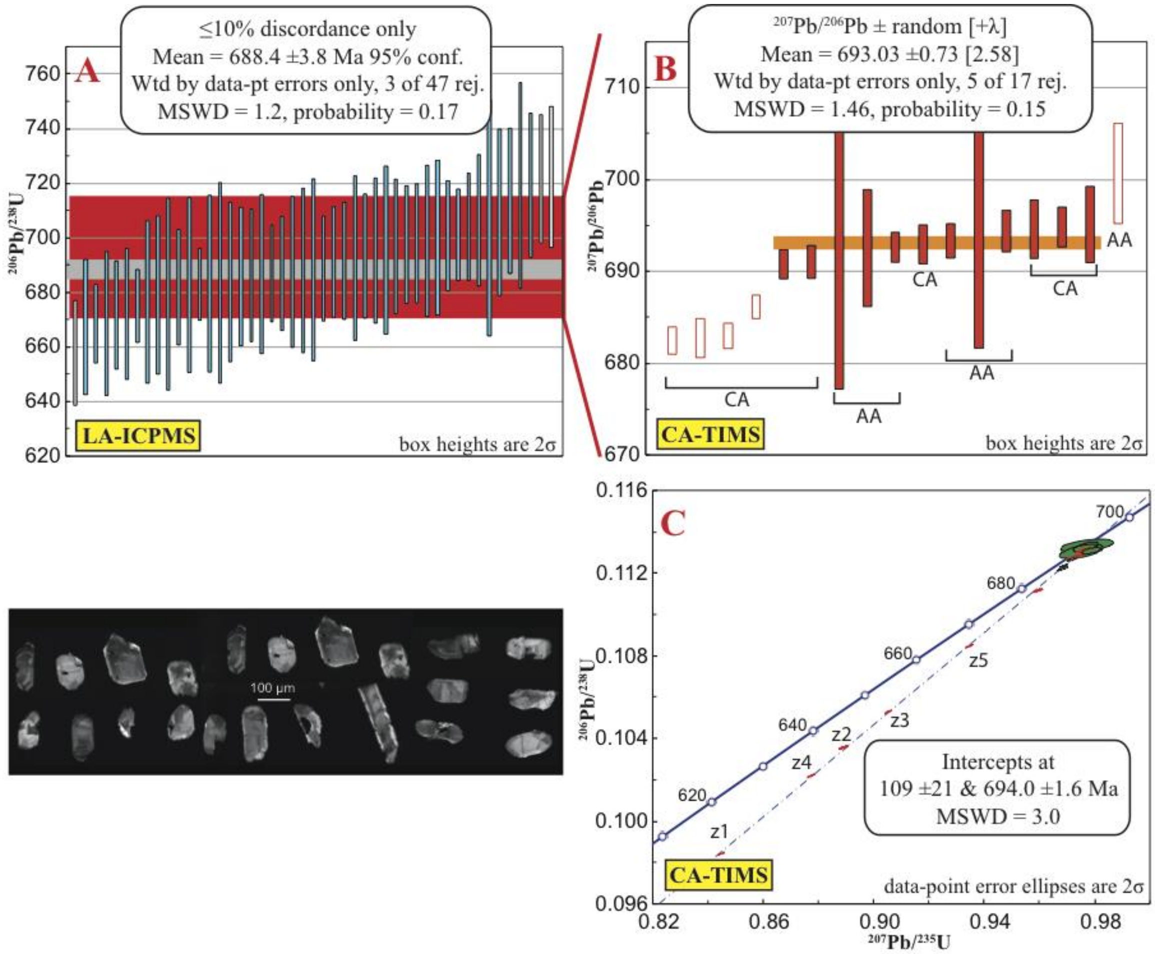


Figure 4.5: Hogback Rhyolite Member sample 15VI003: cathodoluminescence image of representative zircons and, A - Ranked $^{206}Pb/^{238}U$ weighted mean plot using only <10% discordant LA-ICPMS analysis. Solid bars represent data used in age calculation. Horizontal grey bar represents calculated mean age and uncertainty. B - Ranked $^{207}Pb/^{206}Pb$ weighted mean plot for CA-IDTIMS analysis of single and split grain zircons from 15VI003. Solid bars represent data used in age calculation. Horizontal orange bar represents calculated mean age and uncertainty. CA represent grains only Chemically Abraded and AA are grains that were both Air Abraded and chemically abraded. C - 15VI003 Wetherill Concordia plot and intercept age for CA-IDTIMS analysis with chemical abrasion (red) and with both air and chemical abrasion (green).

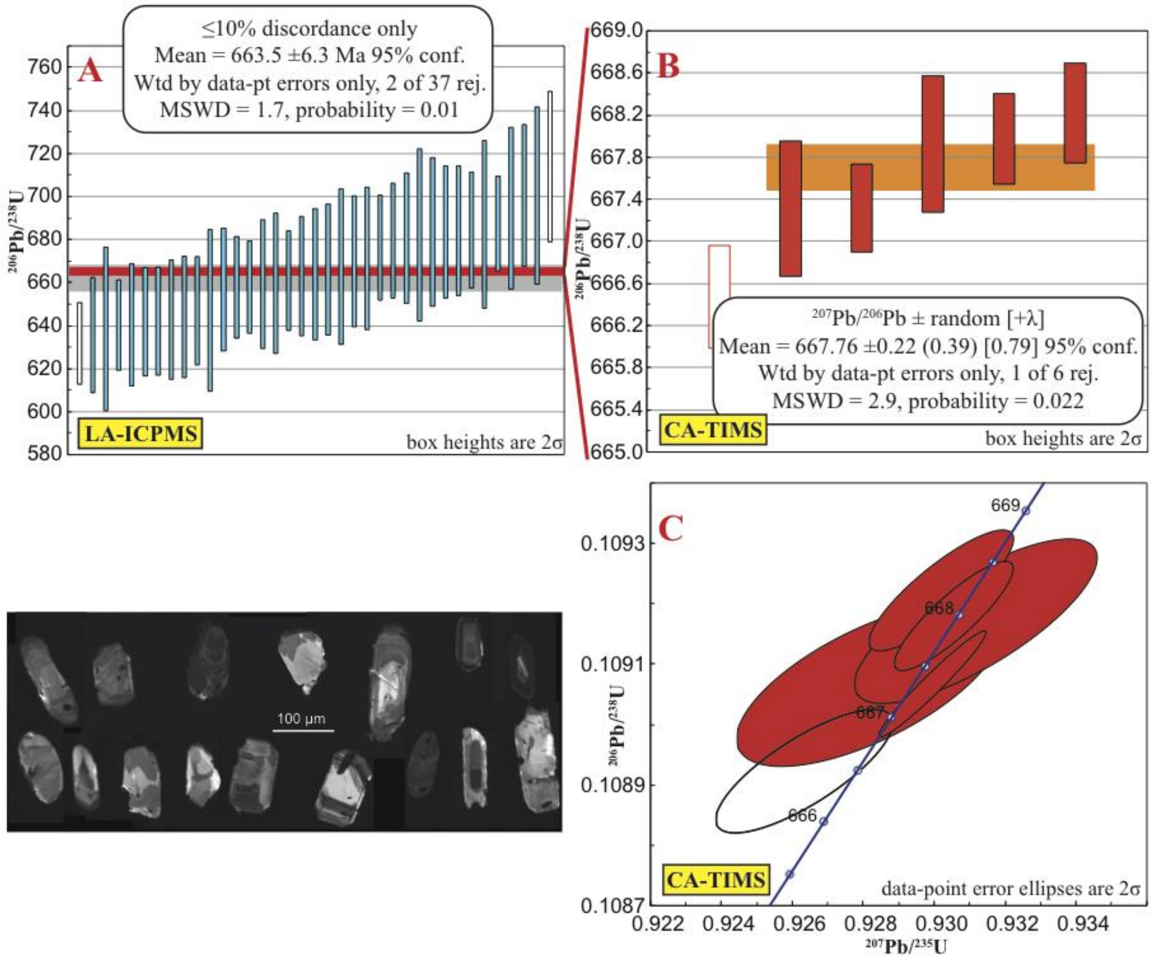


Figure 4.6: Lithic tuff of Daugherty Gulch sample DG-1: cathodoluminescence image of representative zircons and, A - Ranked ^{206}Pb/^{238}U weighted mean plot using only <10% discordant LA-ICPMS analysis. Solid bars represent data used in age calculation. Horizontal grey bar represents calculated mean age and uncertainty. B - Ranked ^{206}Pb/^{238}U weighted mean plot for CA-IDTIMS analysis of single zircons from DG-1. Solid bars represent data used in age calculation. Horizontal orange bar represents calculated mean age and uncertainty. C - DG-1 Wetherill Concordia plot for CA-IDTIMS analysis. Solid error ellipses used in age calculation, open ellipse not used.

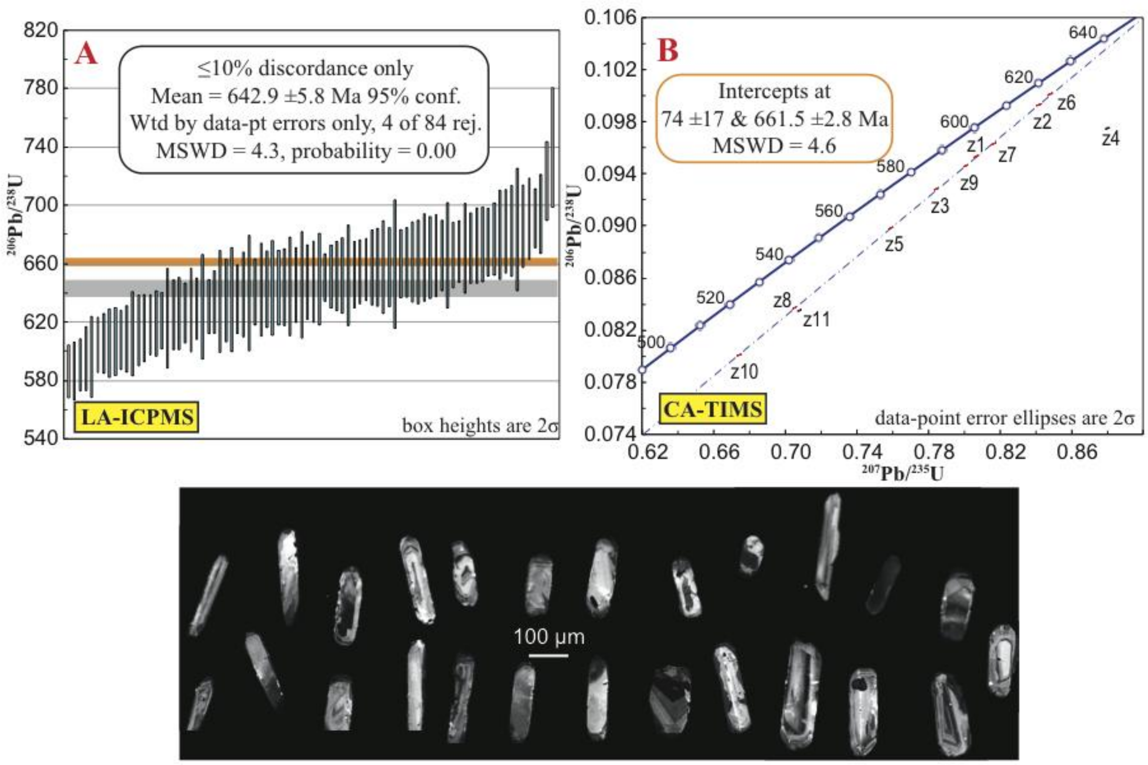


Figure 4.7: Paradise Ridge paragneiss sample 09RL762: cathodoluminescence image of representative zircons and, A - Ranked $^{206}Pb/^{238}U$ weighted mean plot using only <10% discordant LA-ICPMS analysis. Solid bars represent data used in age calculation. Horizontal grey bar represents calculated mean age and uncertainty. Orange bar represents upper intercept age and uncertainty illustrated on Figure B. B - 09RL762 Wetherill Concordia plot for CA-IDTIMS analysis. Z# represents individual CA-IDTIMS analysis on whole grains. Red error ellipses used in age calculation, black ellipses (z11 and z4) not used.

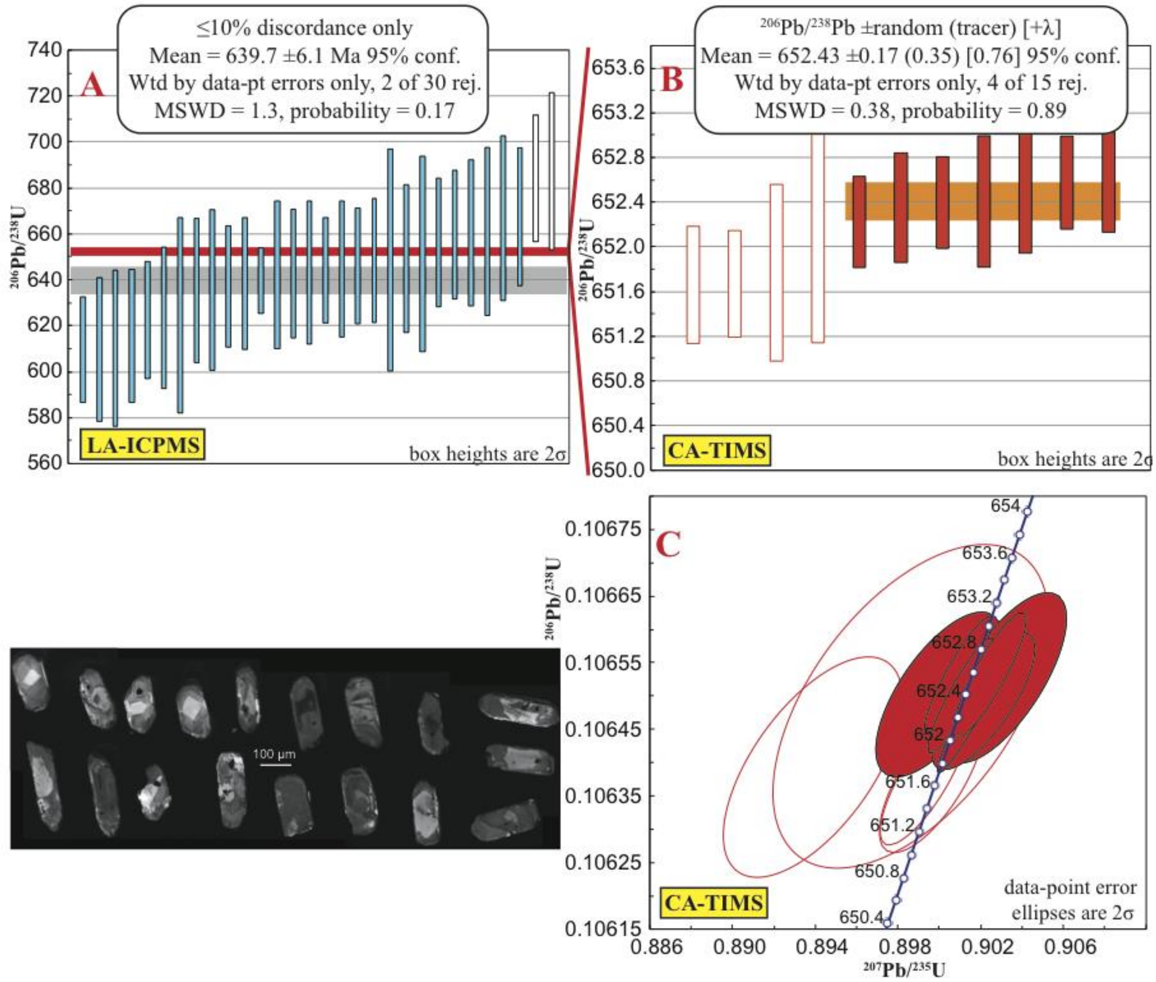


Figure 4.8: Acorn Butte suite syenite sample 3KE043: cathodoluminescence image of representative zircons and, A - Ranked $^{206}Pb/^{238}U$ weighted mean plot using only <10% discordant LA-ICPMS analysis. Solid bars represent data used in age calculation. Horizontal grey bar represents calculated mean age and uncertainty. B - Ranked $^{206}Pb/^{238}U$ weighted mean plot for CA-IDTIMS analysis of split zircons from 3KE043. Solid bars represent data used in age calculation. Horizontal orange bar represents calculated mean age and uncertainty. C - 3KE043 Wetherill Concordia plot from CA-IDTIMS analysis. Solid error ellipses used in age calculation.

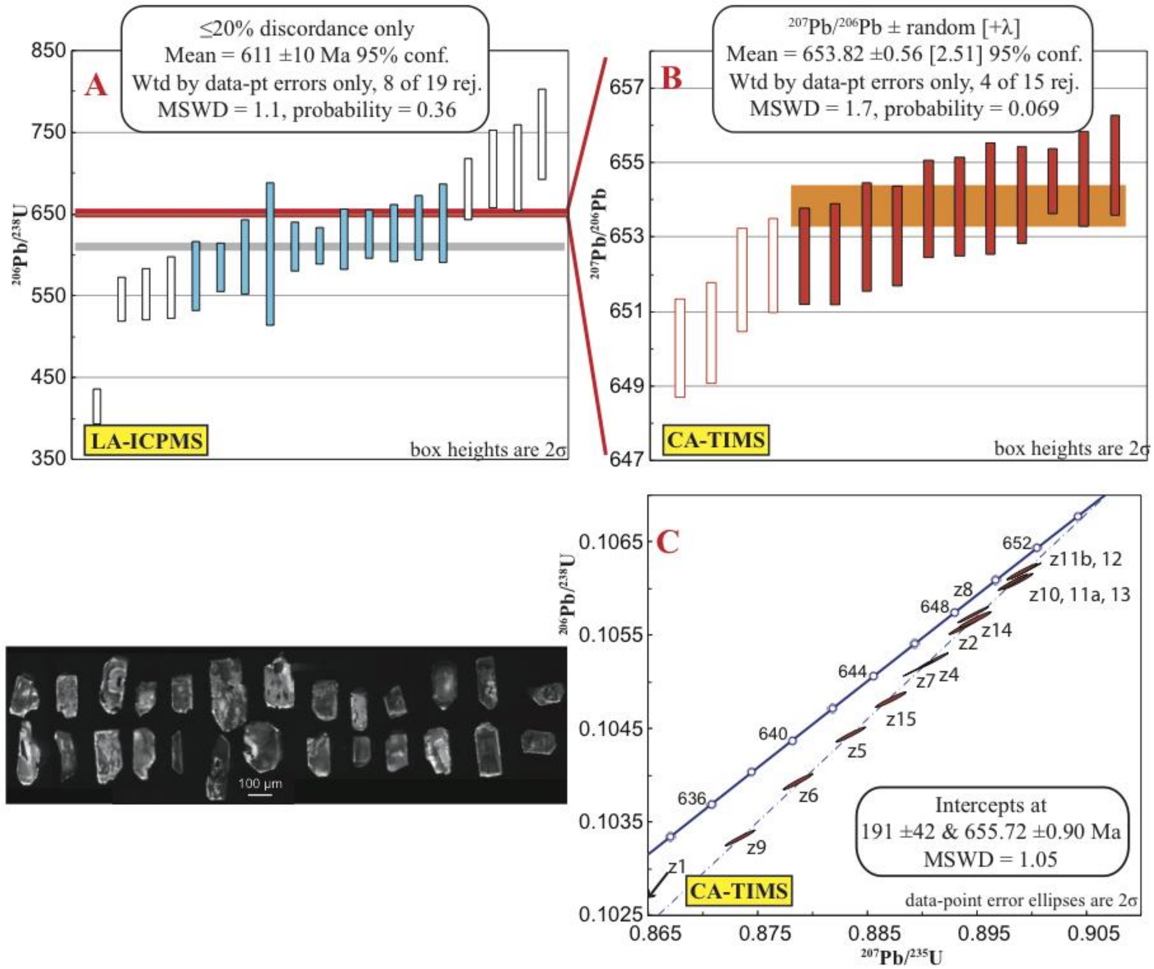


Figure 4.9: **Taylor Ranch syenite sample 01DS-05: cathodoluminescence image of representative zircons and, A - Ranked $^{206}Pb/^{238}U$ weighted mean plot using only <20% discordant LA-ICPMS analysis. Solid bars represent data used in age calculation. Horizontal grey bar represents calculated mean age and uncertainty. B - Ranked $^{207}Pb/^{206}Pb$ weighted mean plot for CA-IDTIMS analysis of single and split zircons from 01DS-05. Solid bars represent data used in age calculation. Horizontal orange bar represents calculated mean age and uncertainty. C - 01DS-05 Wetherill Concordia plot for and intercept age from CA-IDTIMS analysis. Solid error ellipses used in age calculation.**

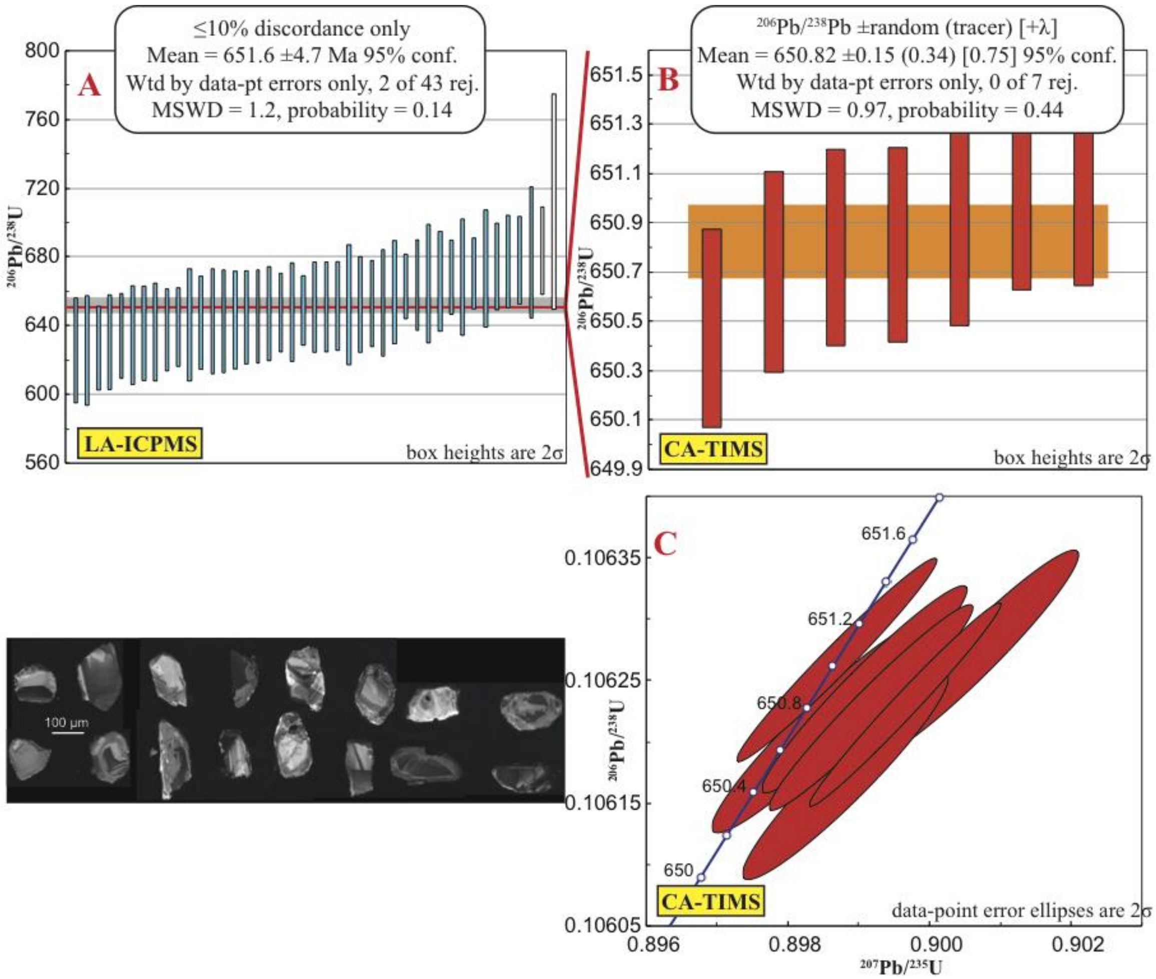


Figure 4.10: Rush Creek Point suite syenite sample 3KE044: cathodoluminescence image of representative zircons and, A - Ranked $^{206}Pb/^{238}U$ weighted mean plot using only <10% discordant LA-ICPMS analysis. Solid bars represent data used in age calculation. Horizontal grey bar represents calculated mean age and uncertainty. B - Ranked $^{206}Pb/^{238}U$ weighted mean plot for CA-IDTIMS analysis of split and whole zircons from 3KE044. Solid bars represent data used in age calculation. Horizontal orange bar represents calculated mean age and uncertainty. C - 3KE044 Wetherill Concordia plot from CA-IDTIMS analysis. Solid error ellipses used in age calculation.

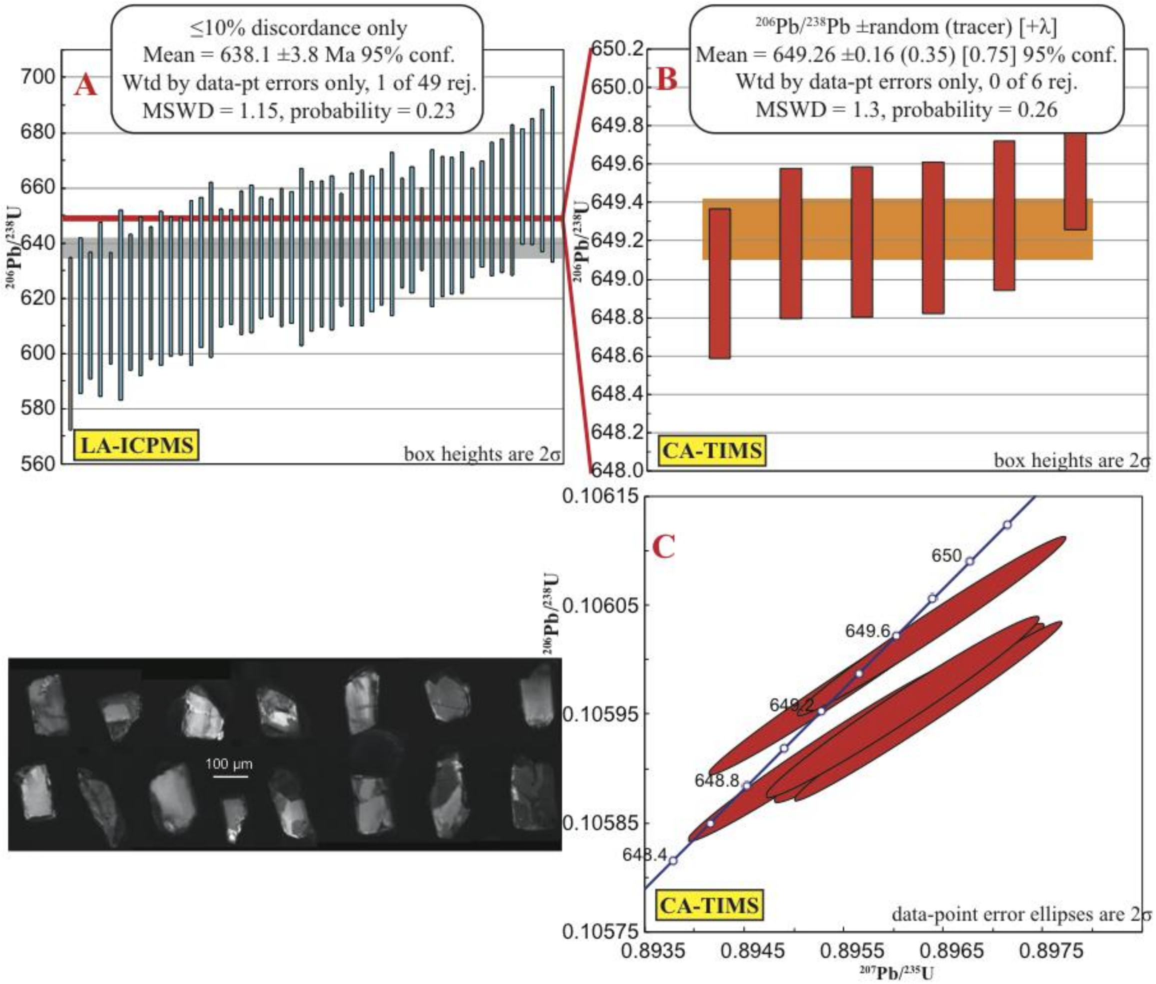
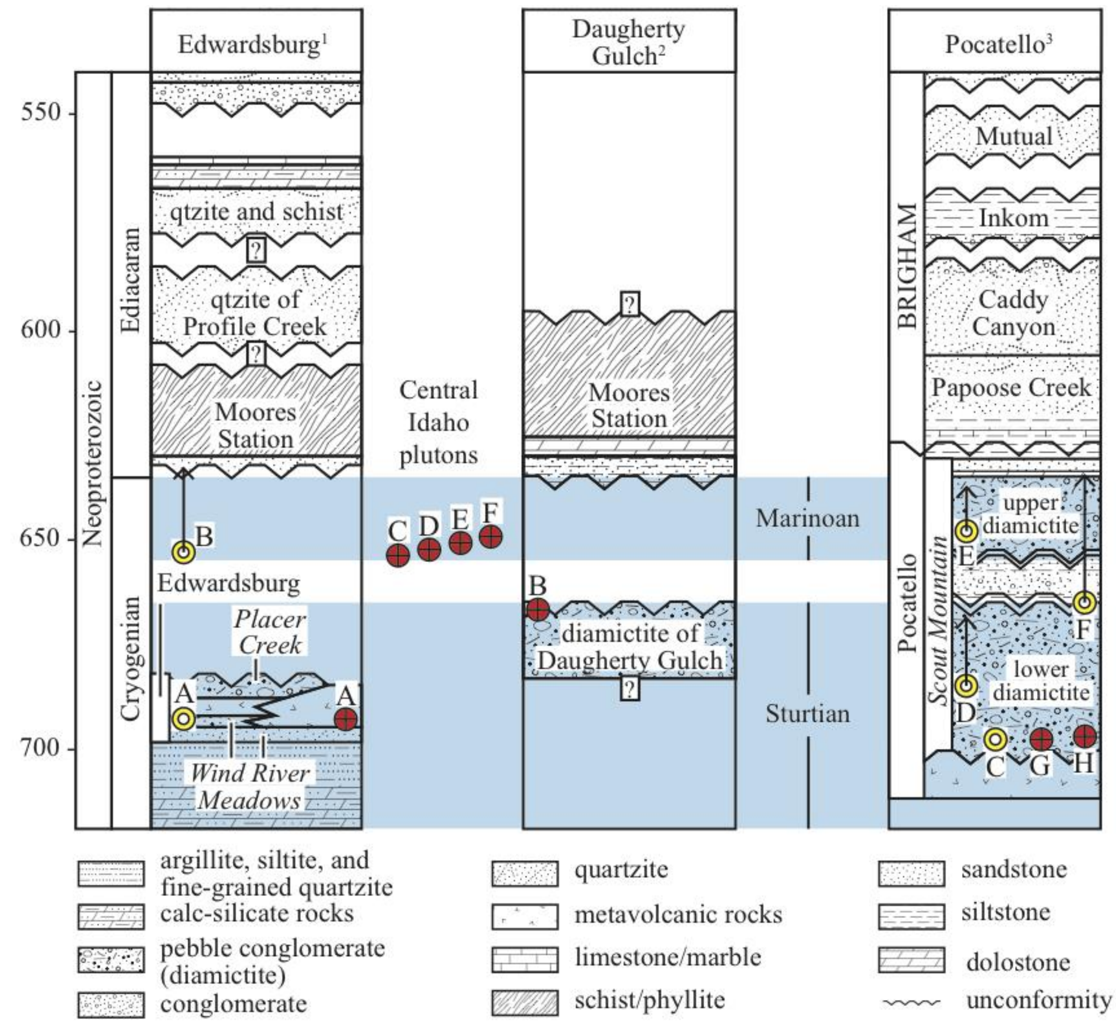


Figure 4.11: Ramey Ridge suite syenite sample 2KE085A: cathodoluminescence image of representative zircons and, A - Ranked $^{206}Pb/^{238}U$ weighted mean plot using only <10% discordant LA-ICPMS analysis. Solid bars represent data used in age calculation. Horizontal grey bar represents calculated mean age and uncertainty. B - Ranked $^{206}Pb/^{238}U$ weighted mean plot for CA-IDTIMS analysis of split and whole zircons from 2KE085A. Solid bars represent data used in age calculation. Horizontal orange bar represents calculated mean age and uncertainty. C - 2KE085A Wetherill Concordia plot from CA-IDTIMS analysis. Solid error ellipses used in age calculation.



igneous CA-IDTIMS U-Pb dates, Isakson (2017a, c)

A - Hogback rhyolite, 693.0 ± 0.7 Ma; **B -** Daugherty Gulch, 667.8 ± 0.52 Ma; **C -** Taylor Ranch, 653.8 ± 0.56 Ma; **D -** Acorn Butte, 652.4 ±0.17 Ma; **E -** Rush Creek, 650.8 ± 0.15 Ma; **F -** Ramey Ridge, 649.3 ± 0.16 Ma; **G -** Scout Mountain, 697.8 ± 0.18 Ma; **H -** Scout Mountain, 697.1 ± 0.28 Ma

maximum depositional age (U-Pb)

A - Wind River Meadows diamcitite, ~692 Ma, Isakson, 2017a; **B -** Moores Stattion quartzite, ~653 Ma, Isakson, 2017a; **C -** lower diamictite, ~697 Ma, Isakson, 2017b; **D -** lower diamictite, ~685 Ma, Keeley et al. (2013); **E -** upper diamictite, ~658 Ma, Isakson (2017c); **F -** cap-carbonate, ~665 Ma and 663 Ma, Isakson, 2017c

Figure 4.12: Correlation chart for Cryogenian through Ediacaran strata from central to southeastern Idaho, showing age and composition of strata, age of related igneous rock, and inferred position of possible unconformities. Position of colored circles is equivalent to calculated date listed (without error) and corresponding arrows signify general stratigraphic position of sample. Modified from 1 - Lewis et al., 2012; Isakson, 2017a, 2 - Lund et al., 2010, 2011; 3 - Fortsch and Link, 1999; Lund et al., 2010, 2011; Isakson, 2017b, c.

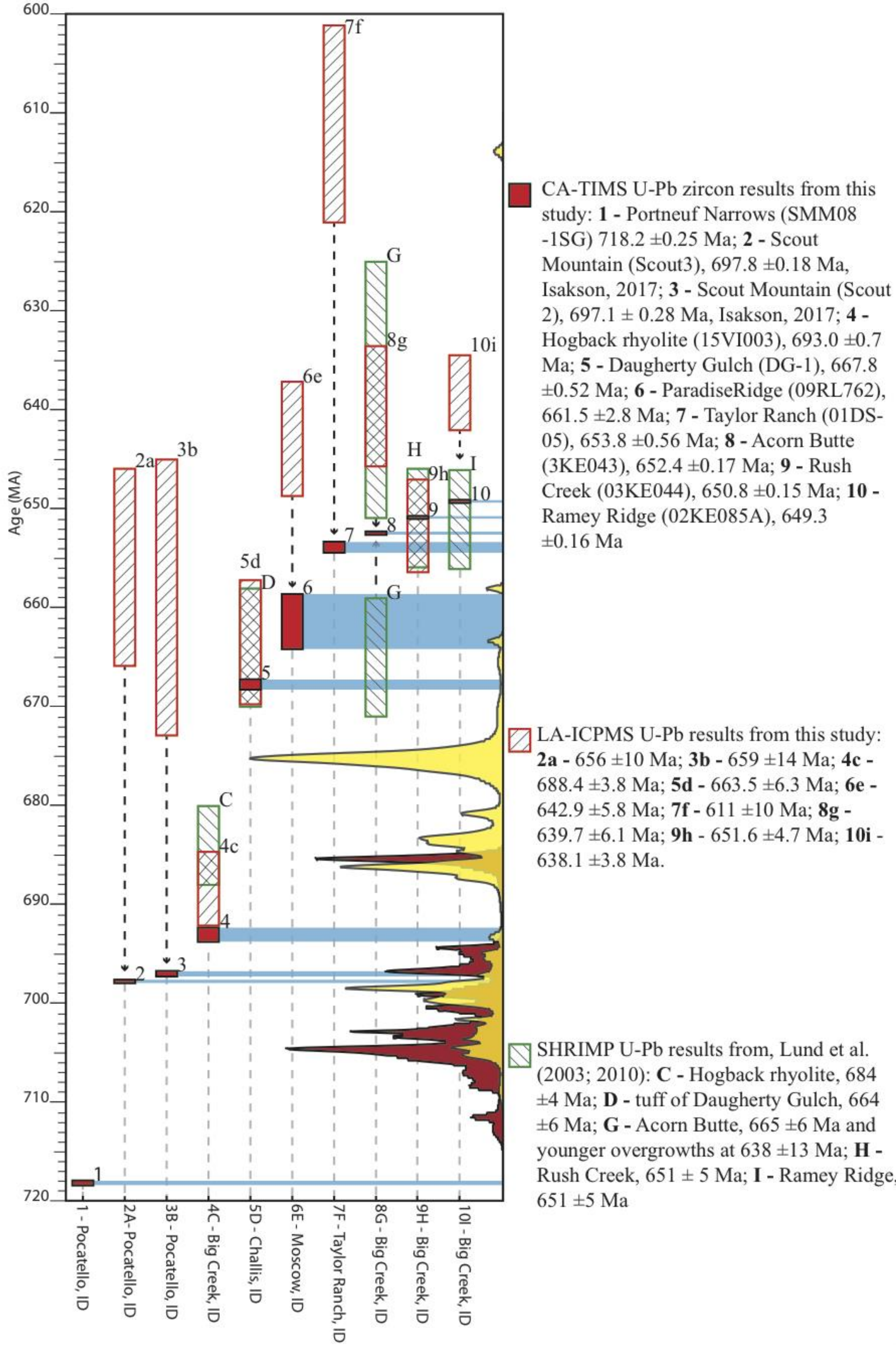

Age (MA)
600
610
620
630
640
650
660
670
680
690
700
710
720
7f
G
8g
10i
6e
H
I
9h
10
9
8
7
2a
3b
5d
D
6
G
5
C
4c
4
2
3
1
1 - Pocatello, ID
2A - Pocatello, ID
3B - Pocatello, ID
4C - Big Creek, ID
5D - Challis, ID
6E - Moscow, ID
7F - Taylor Ranch, ID
8G - Big Creek, ID
9H - Big Creek, ID
10I - Big Creek, ID
CA-TIMS U-Pb zircon results from this study: **1 -** Portneuf Narrows (SMM08 -1SG) 718.2 ±0.25 Ma; **2 -** Scout Mountain (Scout3), 697.8 ±0.18 Ma, Isakson, 2017; **3 -** Scout Mountain (Scout 2), 697.1 ± 0.28 Ma, Isakson, 2017; **4 -** Hogback rhyolite (15VI003), 693.0 ±0.7 Ma; **5 -** Daugherty Gulch (DG-1), 667.8 ±0.52 Ma; **6 -** ParadiseRidge (09RL762), 661.5 ±2.8 Ma; **7 -** Taylor Ranch (01DS-05), 653.8 ±0.56 Ma; **8 -** Acorn Butte (3KE043), 652.4 ±0.17 Ma; **9 -** Rush Creek (03KE044), 650.8 ±0.15 Ma; **10 -** Ramey Ridge (02KE085A), 649.3 ±0.16 Ma
LA-ICPMS U-Pb results from this study: **2a -** 656 ±10 Ma; **3b -** 659 ±14 Ma; **4c -** 688.4 ±3.8 Ma; **5d -** 663.5 ±6.3 Ma; **6e -** 642.9 ±5.8 Ma; **7f -** 611 ±10 Ma; **8g -** 639.7 ±6.1 Ma; **9h -** 651.6 ±4.7 Ma; **10i -** 638.1 ±3.8 Ma.
SHRIMP U-Pb results from, Lund et al. (2003; 2010): **C -** Hogback rhyolite, 684 ±4 Ma; **D -** tuff of Daugherty Gulch, 664 ±6 Ma; **G -** Acorn Butte, 665 ±6 Ma and younger overgrowths at 638 ±13 Ma; **H -** Rush Creek, 651 ± 5 Ma; **I -** Ramey Ridge, 651 ±5 Ma

Figure 4.13: Compilation diagram of CA-IDTIMS, LA-ICPMS, and SHRIMP results (boxes) from Cryogenian igneous samples. Box height represents associated uncertainty of respective weighted mean or upper intercept ages. CA-IDTIMS probability plots (lower right) represents predicted regional magmatism (peaks) from 155 results (yellow, post-Sturtian deposits, Isakson, 2017) and 69 results (red, Sturtian deposits, Keeley et al., 2013; Isakson 2017) from Cryogenian detrital deposits sampled from the Pocatello Formation, southeast Idaho.

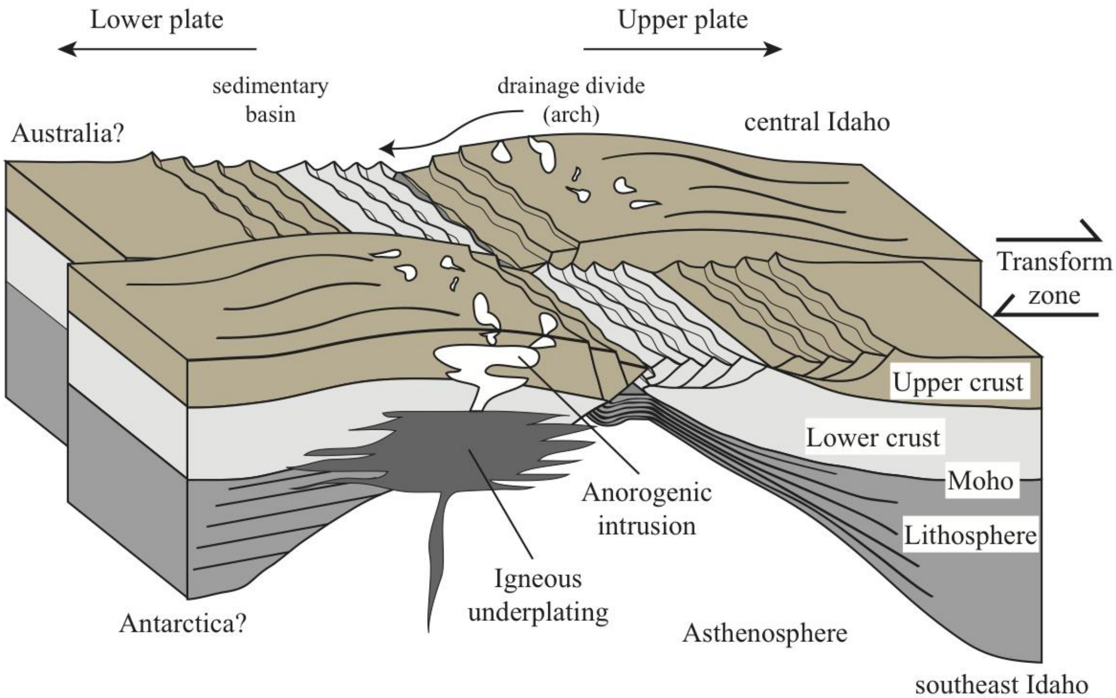


Figure 4.14: Schematic cross-section view of complimentary upper plate and lower plate margins resulting from continental, asymmetric extension, modified from Lister et al., 1991. Upper plate (right-rear and left-front blocks) – relatively unstructured and thermally uplifted, forming a divide (arch) and supply source for juvenile detritus. Lower plate (left-rear and right-front blocks) – remnant tilted blocks above multiple detachment faults, forming a thinned and subsiding sedimentary basin.

Table 4.1

Table 1

Sample I.D.	Location	lithology	Latitude	Longitude	Ages (Ma) SHRIMP[1]	LA-ICPMS	CA-IDTIMS
2KE085A	Big Creek	Ramey Ridge syenite	45.2258	-115.2542	651 ± 5	638.1 ± 3.8	649.3 ± 0.16
3KE044	Big Creek	Rush Creek Point syenite	45.0975	-114.9344	651 ± 5	651.6 ± 4.7	650.8 ± 0.15
3KE043	Big Creek	Acorn Butte syenite	45.1800	-115.0753	665 ± 6	639.7 ± 6.1	652.4 ± 0.17
01DS-05	Big Creek	Ramey Ridge(?) syenite	45.0603	-114.8592		611 ± 10	653.8 ± 0.56
09RL762	Moscow	Paradise Ridge orthogneiss	46.6881	-116.9562		642.9 ± 5.8	661.5 ± 2.8
DG-1	Challis	Daugherty Gulch lithic tuff	44.4858	-114.3317	664 ± 6	663.5 ± 6.3	667.8 ± 0.52
15VI003	Big Creek	Hogback Ridge rhyolite	45.1272	-115.3193	684 ± 4	688.4 ± 3.8	693.0 ± 0.7
Scout 2	Pocatello	pyroclastic rhyolitic bed	42.6868	-112.3537		659 ± 14	697.1 ± 0.28
Scout 3	Pocatello	pyroclastic rhyolitic bed	42.6869	-112.3543		656 ± 10	697.8 ± 0.18
SMM08-1SG	Pocatello	rhyolitic clast	42.7805	-112.3526			718.2 ± 0.25

1 - from Lund et al. (2003, 2010)

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APPENDIX 1A

BSU zircon LA-ICPMS U-Pb geochronology

		Composition				Corrected isotope ratios										Apparent ages (Ma)						
Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{235}U$	±2s (%)	$^{206}Pb/^{238}U$	±2s (%)	error corr.	$^{238}U/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (abs)	$^{207}Pb/^{235}U$	±2s (abs)	$^{206}Pb/^{238}U$	±2s (abs)	% disc.
14DS12																						
<10% discordant																						
14DS12 L 165	1	71	31	15	0.43	496	1.911	5.2	0.1811	4.2	0.80	5.5225	4.2	0.0765	3.1	1109	63	1085	35	1073	42	3
14DS12 L 171	1	176	64	64	0.36	4008	4.203	3.7	0.2950	3.3	0.89	3.3895	3.3	0.1033	1.7	1685	32	1675	30	1667	48	1
14DS12 L 172	1	27	15	8	0.56	421	3.120	7.0	0.2488	4.0	0.58	4.0195	4.0	0.0910	5.7	1446	109	1438	54	1432	52	1
14DS12 L 175	1	140	81	14	0.58	220	0.629	5.5	0.0809	3.3	0.61	12.3592	3.3	0.0564	4.3	468	96	495	21	502	16	-7
14DS12 L 176	1	143	93	45	0.65	4979	3.088	3.5	0.2456	3.0	0.84	4.0715	3.0	0.0912	1.9	1450	37	1430	27	1416	38	2
14DS12 L 177	1	167	101	108	0.60	11258	11.819	3.6	0.4751	3.4	0.94	2.1049	3.4	0.1804	1.2	2657	20	2590	34	2506	70	6
14DS12 L 179	1	222	143	23	0.64	824	0.642	5.5	0.0813	3.6	0.65	12.2961	3.6	0.0573	4.2	503	92	504	22	504	17	0
14DS12 L 180	1	360	143	34	0.40	4501	0.624	4.3	0.0803	3.4	0.80	12.4591	3.4	0.0564	2.6	467	57	492	17	498	16	-7
14DS12 L 182	1	171	149	73	0.87	4147	4.618	3.1	0.3088	2.8	0.91	3.2378	2.8	0.1084	1.3	1773	24	1752	26	1735	43	2
14DS12 L 183	1	132	309	76	2.35	2887	4.773	4.3	0.3191	4.0	0.93	3.1341	4.0	0.1085	1.6	1774	29	1780	36	1785	62	-1
14DS12 L 185	1	173	76	98	0.44	3477	9.588	2.6	0.4419	2.3	0.89	2.2628	2.3	0.1574	1.2	2427	20	2396	24	2359	45	3

14DS12 L 190	1	83	69	11	0.84	513	0.912	5.6	0.1053	4.3	0.77	9.4993	4.3	0.0628	3.6	703	76	658	27	645	27	8
14DS12 L 191	1	19	0	7	0.01	2706	5.063	6.7	0.3244	5.5	0.81	3.0826	5.5	0.1132	3.9	1851	71	1830	57	1811	86	2
14DS12 L 192	1	211	128	83	0.61	3093	4.413	5.6	0.3013	5.4	0.98	3.3193	5.4	0.1062	1.2	1736	22	1715	46	1698	81	2
14DS12 L 193	1	83	45	8	0.55	674	0.600	6.9	0.0780	4.0	0.58	12.8215	4.0	0.0558	5.6	445	125	477	26	484	19	-9
14DS12 L 194	1	511	448	53	0.88	7582	0.601	4.8	0.0754	4.1	0.86	13.2697	4.1	0.0578	2.5	523	54	478	18	468	19	10
14DS12 L 196	1	217	100	82	0.46	51849	4.394	5.2	0.2996	4.9	0.94	3.3381	4.9	0.1064	1.8	1738	34	1711	43	1689	73	3
14DS12 L 197	1	285	178	29	0.63	2443	0.640	5.9	0.0817	5.1	0.86	12.2336	5.1	0.0567	3.0	482	66	502	24	507	25	-5
14DS12 L 200	1	117	131	14	1.13	316	0.658	6.6	0.0820	4.3	0.66	12.1913	4.3	0.0582	5.0	537	109	513	27	508	21	5
14DS12 L 202	1	134	76	13	0.57	5722	0.620	5.9	0.0779	3.0	0.51	12.8422	3.0	0.0577	5.0	519	111	490	23	483	14	7
14DS12 L 203	1	206	148	21	0.72	451	0.620	4.4	0.0790	3.5	0.79	12.6542	3.5	0.0569	2.7	487	60	490	17	490	17	-1
14DS12 L 205	1	142	80	14	0.56	582	0.651	4.0	0.0813	2.3	0.58	12.2926	2.3	0.0580	3.2	530	70	509	16	504	11	5
14DS12 L 206	1	196	145	20	0.74	364	0.635	5.1	0.0797	3.4	0.68	12.5517	3.4	0.0578	3.7	522	81	499	20	494	16	5
14DS12 L 207	1	64	54	6	0.85	465	0.616	7.2	0.0780	3.6	0.50	12.8241	3.6	0.0573	6.2	502	137	487	28	484	17	4
14DS12 L 208	1	260	144	25	0.55	1570	0.615	4.7	0.0782	4.1	0.87	12.7932	4.1	0.0571	2.3	494	52	487	18	485	19	2
14DS12 L 209	1	102	64	10	0.63	933	0.635	4.8	0.0815	3.4	0.71	12.2654	3.4	0.0565	3.4	473	74	499	19	505	17	-7
14DS12 L 214	1	92	75	9	0.81	779	0.623	5.4	0.0782	3.7	0.69	12.7843	3.7	0.0577	3.9	520	86	492	21	485	18	7

14DS12 L 217	1	31	9	11	0.30	252	4.784	4.2	0.3074	3.1	0.73	3.2530	3.1	0.1129	2.9	1846	53	1782	36	1728	47	6
14DS12 L 219	1	151	78	55	0.52	35125	4.314	3.3	0.2958	3.0	0.90	3.3803	3.0	0.1058	1.5	1727	27	1696	27	1671	44	3
14DS12 L 220	1	163	141	17	0.86	2025	0.608	7.3	0.0774	4.7	0.64	12.9230	4.7	0.0570	5.6	490	125	482	28	480	22	2
14DS12 L 222	1	135	98	14	0.73	221	0.628	5.2	0.0790	3.4	0.66	12.6540	3.4	0.0576	3.9	515	86	495	20	490	16	5
14DS12 L 223	1	76	31	30	0.40	732	5.036	4.3	0.3208	4.0	0.92	3.1169	4.0	0.1138	1.7	1862	31	1825	37	1794	63	4
14DS12 L 225	1	367	107	241	0.29	22853	13.481	4.3	0.5115	4.1	0.96	1.9551	4.1	0.1912	1.2	2752	19	2714	41	2663	90	3
14DS12 L 227	1	216	205	147	0.95	3160	10.790	4.2	0.4600	4.1	0.95	2.1740	4.1	0.1701	1.3	2559	21	2505	39	2439	82	5
14DS12 L 228	1	119	79	15	0.66	569	0.837	10.6	0.0992	7.8	0.74	10.0790	7.8	0.0612	7.1	647	153	618	49	610	46	6
14DS12 L 229	1	275	222	28	0.81	2863	0.609	3.8	0.0766	2.7	0.72	13.0544	2.7	0.0577	2.6	518	58	483	15	476	13	8
14DS12 L 230	1	150	105	62	0.70	3916	4.714	4.9	0.3074	4.6	0.93	3.2534	4.6	0.1112	1.8	1819	32	1770	41	1728	70	5
14DS12 L 231	1	99	111	25	1.13	1421	1.845	5.2	0.1767	4.1	0.78	5.6606	4.1	0.0757	3.3	1088	66	1061	34	1049	39	4
14DS12 L 233	1	66	36	6	0.54	26242	0.617	6.6	0.0798	4.3	0.65	12.5296	4.3	0.0560	5.0	454	112	488	26	495	20	-9
14DS12 L 234	1	130	86	14	0.66	289	0.664	6.7	0.0843	4.5	0.66	11.8590	4.5	0.0571	5.0	495	110	517	27	522	22	-5
14DS12 L 236	1	140	68	13	0.48	5352	0.621	5.4	0.0781	3.2	0.59	12.7964	3.2	0.0576	4.4	515	96	490	21	485	15	6
14DS12 L 237	1	239	151	24	0.63	539	0.641	5.1	0.0806	3.7	0.72	12.4040	3.7	0.0577	3.5	518	78	503	20	500	18	4
14DS12 L 241	1	46	11	13	0.23	179	3.013	4.3	0.2440	3.0	0.69	4.0990	3.0	0.0896	3.1	1416	60	1411	33	1407	37	1

14DS12 L 242	1	48	15	18	0.31	3625	4.692	5.3	0.3101	4.6	0.86	3.2249	4.6	0.1097	2.7	1795	49	1766	44	1741	70	3
14DS12 L 243	1	108	71	43	0.65	3817	4.305	3.5	0.2998	2.8	0.80	3.3355	2.8	0.1041	2.1	1699	39	1694	29	1690	42	1
14DS12 L 244	1	132	78	41	0.59	20656	3.017	4.0	0.2451	3.4	0.85	4.0805	3.4	0.0893	2.1	1411	41	1412	31	1413	43	0
14DS12 L 245	1	132	84	13	0.64	207	0.633	4.9	0.0794	3.2	0.67	12.5948	3.2	0.0578	3.6	522	80	498	19	493	15	6
14DS12 L 247	1	306	110	111	0.36	3622	4.257	4.1	0.2998	3.9	0.95	3.3352	3.9	0.1030	1.3	1678	24	1685	34	1690	58	-1
14DS12 L 248	1	110	43	38	0.40	1140	4.104	3.7	0.2846	3.0	0.81	3.5139	3.0	0.1046	2.2	1707	40	1655	30	1614	42	5
14DS12 S 2531	160	87	15	0.54	5789	0.594	5.5	0.0754	3.9	0.71	13.2637	3.9	0.0571	3.9	497	85	473	21	469	18	6	
14DS12 S 2551	115	99	12	0.87	575	0.613	6.0	0.0788	3.5	0.59	12.6849	3.5	0.0564	4.8	469	107	486	23	489	17	-4	
14DS12 S 2571	109	71	11	0.65	360	0.614	5.7	0.0781	3.7	0.65	12.8105	3.7	0.0571	4.3	494	96	486	22	485	17	2	
14DS12 S 2591	110	50	41	0.45	7996	4.355	4.3	0.2977	3.8	0.89	3.3594	3.8	0.1061	2.0	1734	37	1704	36	1680	57	3	
14DS12 S 2612	69	49	7	0.70	545	0.614	6.7	0.0775	5.0	0.75	12.9053	5.0	0.0574	4.4	509	96	486	26	481	23	5	
14DS12 S 2652	49	37	18	0.76	544	3.961	5.9	0.2845	5.0	0.85	3.5148	5.0	0.1010	3.1	1642	58	1626	48	1614	72	2	
14DS12 S 2712	70	49	7	0.69	213	0.591	8.4	0.0750	3.8	0.45	13.3285	3.8	0.0571	7.5	497	166	472	32	466	17	6	
14DS12 S 2762	76	89	8	1.18	192	0.601	8.8	0.0775	4.8	0.54	12.9037	4.8	0.0562	7.4	461	165	478	34	481	22	-4	
14DS12 S 2792	52	39	5	0.74	73	0.613	7.7	0.0784	3.8	0.49	12.7479	3.8	0.0567	6.7	479	148	485	30	487	18	-2	
14DS12 S 2802	167	215	20	1.28	482	0.650	6.7	0.0809	6.0	0.89	12.3614	6.0	0.0583	3.0	540	66	509	27	501	29	7	

14DS12 S 29027	491	505	54	1.03	5544	0.629	4.7	0.0788	4.1	0.87	12.6980	4.1	0.0579	2.3	527	51	495	19	489	19
14DS12 S 2932-9	157	74	15	0.47	1839	0.614	5.2	0.0796	3.3	0.63	12.5661	3.3	0.0560	4.0	452	89	486	20	494	16
14DS12 S 29523	214	140	21	0.66	412	0.617	4.5	0.0783	3.1	0.68	12.7721	3.1	0.0572	3.3	499	73	488	18	486	14
14DS12 S 29622	149	127	61	0.85	46361	4.364	3.7	0.3002	3.3	0.89	3.3311	3.3	0.1054	1.7	1722	31	1705	30	1692	49
14DS12 S 29726	280	214	27	0.77	357	0.597	4.3	0.0756	3.5	0.81	13.2214	3.5	0.0572	2.5	500	55	475	16	470	16
14DS12 S 29826	284	188	28	0.66	564	0.626	4.6	0.0787	3.5	0.75	12.7093	3.5	0.0577	3.0	520	66	494	18	488	16
14DS12 S 30226	292	315	118	1.08	2941	4.258	1.8	0.2899	1.5	0.85	3.4494	1.5	0.1065	0.9	1741	17	1685	15	1641	22
14DS12 S 3052-10	68	55	7	0.81	129	0.623	7.2	0.0807	3.5	0.49	12.3881	3.5	0.0560	6.2	453	138	492	28	500	17
14DS12 S 30921	203	172	63	0.85	2526	2.884	3.6	0.2377	3.1	0.86	4.2073	3.1	0.0880	1.8	1382	35	1378	27	1375	38
14DS12 S 31027	101	44	45	0.43	2139	6.554	3.4	0.3583	2.3	0.69	2.7907	2.3	0.1327	2.5	2133	43	2053	30	1974	40
14DS12 S 31226	219	181	23	0.83	544	0.629	4.9	0.0789	4.3	0.87	12.6664	4.3	0.0578	2.4	523	53	496	19	490	20
14DS12 S 31423	192	90	73	0.47	79724	4.520	4.1	0.3042	4.0	0.96	3.2870	4.0	0.1077	1.1	1762	21	1735	34	1712	60
14DS12 S 315210	687	379	245	0.55	8871	4.235	5.3	0.2814	5.3	0.99	3.5542	5.3	0.1092	0.7	1786	13	1681	44	1598	74
14DS12 S 3222-6	73	41	8	0.57	205	0.654	7.8	0.0834	5.0	0.64	11.9845	5.0	0.0569	6.0	487	133	511	31	517	25
14DS12 S 32325	111	100	12	0.90	1601	0.667	6.6	0.0830	4.7	0.71	12.0419	4.7	0.0583	4.7	540	103	519	27	514	23
14DS12 S 3252-	128	143	14	1.12	608	0.604	5.1	0.0781	3.3	0.65	12.8065	3.3	0.0561	3.9	455	87	480	20	485	16

>10% discordance

14DS12 L 161	1	76	55	8	0.72	5997	0.595	8.2	0.0808	4.3	0.52	12.3758	4.3	0.0534	7.0	347	158	474	31	501	21	-44
14DS12 L 163	1	127	72	12	0.57	2524	0.617	6.8	0.0766	4.6	0.68	13.0521	4.6	0.0584	5.0	546	110	488	26	476	21	13
14DS12 L 164	1	112	85	12	0.76	326	0.683	6.1	0.0820	5.2	0.86	12.1957	5.2	0.0604	3.1	617	67	528	25	508	26	18
14DS12 L 166	1	58	30	6	0.52	172	0.621	8.4	0.0820	5.2	0.61	12.1888	5.2	0.0549	6.7	409	149	491	33	508	25	-24
14DS12 L 169	1	201	151	21	0.75	73346	0.651	5.2	0.0795	4.0	0.77	12.5739	4.0	0.0593	3.3	580	71	509	21	493	19	15
14DS12 L 170	1	81	58	8	0.71	794	0.627	7.1	0.0778	4.5	0.64	12.8554	4.5	0.0584	5.5	545	119	494	28	483	21	11
14DS12 L 174	1	87	56	9	0.65	780	0.623	5.8	0.0814	3.6	0.61	12.2803	3.6	0.0555	4.6	432	102	492	23	505	17	-17
14DS12 L 178	1	39	39	4	0.99	450	0.595	8.0	0.0789	3.5	0.44	12.6716	3.5	0.0547	7.2	398	161	474	30	490	17	-23
14DS12 L 181	1	108	78	11	0.72	951	0.673	4.4	0.0810	3.1	0.71	12.3405	3.1	0.0602	3.1	612	68	523	18	502	15	18
14DS12 L 184	1	61	35	5	0.57	625	0.645	8.9	0.0742	6.4	0.73	13.4850	6.4	0.0631	6.1	711	129	505	35	461	29	35
14DS12 L 187	1	84	52	8	0.62	425	0.634	6.0	0.0826	4.1	0.69	12.1119	4.1	0.0557	4.4	440	98	498	24	511	20	-16
14DS12 L 189	1	85	82	9	0.97	637	0.581	8.1	0.0779	5.2	0.64	12.8311	5.2	0.0541	6.2	375	140	465	30	484	24	-29
14DS12 L 199	1	77	44	7	0.58	5416	0.649	6.7	0.0761	2.9	0.42	13.1342	2.9	0.0618	6.1	669	131	508	27	473	13	29
14DS12 L 204	1	69	68	8	0.99	230	0.643	7.4	0.0793	3.4	0.46	12.6112	3.4	0.0588	6.6	559	144	504	30	492	16	12
14DS12 L 211	1	106	88	11	0.83	618	0.590	6.9	0.0786	4.3	0.62	12.7206	4.3	0.0545	5.4	391	120	471	26	488	20	-25

14DS12 L 212	1	42	27	4	0.64	93	0.649	9.6	0.0784	3.6	0.38	12.7534	3.6	0.0600	8.9	605	192	508	38	487	17	20
14DS12 L 213	1	69	47	7	0.68	522	0.609	7.0	0.0793	3.8	0.54	12.6152	3.8	0.0557	5.9	442	132	483	27	492	18	-11
14DS12 L 218	1	7	7	1	0.99	59	1.036	16.6	0.1139	7.0	0.42	8.7829	7.0	0.0660	15.1	806	315	722	86	695	46	14
14DS12 L 224	1	50	35	5	0.70	157	0.611	8.3	0.0814	4.9	0.59	12.2897	4.9	0.0544	6.7	389	151	484	32	504	24	-30
14DS12 L 226	1	103	83	11	0.81	879	0.641	7.7	0.0791	3.7	0.48	12.6345	3.7	0.0588	6.7	559	146	503	30	491	17	12
14DS12 L 232	1	93	69	10	0.74	768	0.684	6.3	0.0797	3.8	0.61	12.5527	3.8	0.0623	5.0	685	107	529	26	494	18	28
14DS12 L 238	1	156	79	29	0.51	597	1.566	13.3	0.1492	13.1	0.98	6.7024	13.1	0.0761	2.7	1098	54	957	83	896	109	18
14DS12 L 240	1	75	39	7	0.52	115	0.679	5.9	0.0781	3.8	0.65	12.8021	3.8	0.0631	4.5	710	96	526	24	485	18	32
14DS12 S 2541	136	60	13	0.44	973	0.646	5.5	0.0789	4.7	0.85	12.6775	4.7	0.0594	2.9	583	63	506	22	489	22	16	
14DS12 S 2561	234	328	27	1.40	1108	0.620	6.3	0.0761	5.6	0.89	13.1368	5.6	0.0591	2.8	570	62	490	24	473	25	17	
14DS12 S 2581	79	46	8	0.59	14815	0.638	6.7	0.0790	4.1	0.62	12.6594	4.1	0.0585	5.3	550	115	501	26	490	20	11	
14DS12 S 2622	81	50	8	0.62	180	0.655	5.2	0.0794	3.6	0.69	12.5941	3.6	0.0598	3.7	596	81	511	21	493	17	17	
14DS12 S 2632	152	102	15	0.67	457	0.625	8.0	0.0753	3.7	0.47	13.2722	3.7	0.0602	7.1	611	154	493	31	468	17	23	
14DS12 S 2662	226	163	22	0.72	1080	0.621	6.0	0.0770	4.6	0.76	12.9875	4.6	0.0585	3.9	547	85	490	23	478	21	13	
14DS12 S 2702	857	1049	88	1.22	5784	0.597	4.0	0.0729	3.3	0.82	13.7253	3.3	0.0594	2.3	581	50	475	15	453	14	22	
14DS12 S 2722	90	120	10	1.33	886	0.603	5.9	0.0790	3.3	0.56	12.6587	3.3	0.0554	4.9	427	109	479	23	490	16	-15	

14DS12 S 2732 14	249	363	27	1.46	3831	0.590	5.5	0.0736	4.6	0.83	13.5897	4.6	0.0581	3.0	535	67	471	21	458	20
14DS12 S 2752 -21	94	75	9	0.79	816	0.589	5.7	0.0780	4.0	0.70	12.8186	4.0	0.0547	4.1	401	91	470	21	484	19
14DS12 S 2772 15	154	178	17	1.16	256	0.641	5.7	0.0786	3.8	0.66	12.7199	3.8	0.0591	4.3	572	93	503	23	488	18
14DS12 S 2782 26	60	40	6	0.67	309	0.649	7.6	0.0770	4.7	0.62	12.9921	4.7	0.0612	6.0	645	129	508	30	478	22
14DS12 S 2892 20	153	117	16	0.76	325	0.638	5.5	0.0773	3.9	0.71	12.9428	3.9	0.0599	3.8	599	83	501	22	480	18
14DS12 S 2912 27	194	158	21	0.81	624	0.693	4.9	0.0807	3.9	0.79	12.3944	3.9	0.0623	3.0	684	64	535	20	500	19
14DS12 S 2922 31	13	16	5	1.23	110	4.599	9.4	0.2550	3.6	0.38	3.9214	3.6	0.1308	8.7	2109	153	1749	79	1464	47
14DS12 S 3032 -21	48	42	5	0.89	40	0.628	6.8	0.0824	4.4	0.64	12.1333	4.4	0.0553	5.3	424	117	495	27	511	21
14DS12 S 3042 15	359	410	34	1.14	3107	0.553	3.9	0.0698	2.4	0.61	14.3331	2.4	0.0575	3.1	510	68	447	14	435	10
14DS12 S 3072 42	27	24	3	0.89	461	0.768	7.7	0.0819	4.5	0.58	12.2027	4.5	0.0680	6.3	869	130	579	34	508	22
14DS12 S 3112 12	139	103	14	0.74	274	0.645	4.9	0.0796	3.8	0.79	12.5583	3.8	0.0588	3.0	559	65	506	19	494	18
14DS12 S 3132 14	214	258	22	1.21	636	0.582	5.3	0.0729	3.6	0.68	13.7241	3.6	0.0579	3.9	526	85	465	20	453	16
14DS12 S 3162 -15	267	339	32	1.27	780	0.620	8.5	0.0810	8.0	0.94	12.3480	8.0	0.0556	3.0	435	67	490	33	502	38
14DS12 S 3172 -22	99	56	10	0.56	900	0.614	6.3	0.0810	3.9	0.61	12.3416	3.9	0.0550	5.0	411	112	486	24	502	19
14DS12 S 3242 30	199	55	45	0.28	150819	2.664	7.5	0.1933	7.3	0.97	5.1729	7.3	0.1000	1.8	1623	33	1319	55	1139	76

Composition **Corrected isotope ratios** **Apparent ages (Ma)**

Analysis notes	U ppm	Th ppm	Pb ppm	Th/U	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{235}U$	±2s (%)	$^{206}Pb/^{238}U$	±2s (%)	error corr.	$^{238}U/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (abs)	$^{207}Pb/^{235}U$	±2s (abs)	$^{206}Pb/^{238}U$	±2s (abs)	% disc.
14RL011a																					
10% discordant																					
14RL011a L 11 8		373	384	246	1.03	12060	11.013	3.6	0.4519	3.4	0.96	2.2131	3.4	0.1768	1.0	2623	17	2524	33	2404	69
14RL011a L 21 8		11	11	3	0.98	49	1.899	9.2	0.1768	5.0	0.54	5.6572	5.0	0.0779	7.8	1145	155	1081	61	1049	48
14RL011a L 31 -2		16	10	4	0.65	146	2.071	7.2	0.1945	4.7	0.65	5.1425	4.7	0.0773	5.5	1128	109	1139	49	1145	49
14RL011a L 51 6		151	178	106	1.18	20050	11.096	4.8	0.4608	4.6	0.96	2.1702	4.6	0.1747	1.3	2603	21	2531	45	2443	94
14RL011a L 81 5		112	73	46	0.65	978	4.792	3.9	0.3106	3.6	0.92	3.2197	3.6	0.1119	1.5	1830	27	1783	33	1744	55
14RL011a L 91 0		8	2	5	0.28	116	12.404	6.1	0.5060	4.7	0.77	1.9761	4.7	0.1778	3.9	2632	64	2635	57	2640	102
14RL011a L 10 65	1	1	111	85	48	0.76	1474	4.815	4.4	0.3177	4.2	0.95	3.1478	4.2	0.1099	1.4	1798	25	1788	37	1778
14RL011a L 11 39	1	1	222	108	69	0.49	9906	3.137	3.4	0.2495	3.0	0.90	4.0074	3.0	0.0912	1.5	1450	28	1442	26	1436
14RL011a L 12 27	5	1	102	62	31	0.60	1021	2.943	3.3	0.2361	2.2	0.65	4.2351	2.2	0.0904	2.5	1434	48	1393	25	1367
14RL011a L 13 30	3	1	34	32	8	0.92	123	1.613	6.4	0.1617	3.4	0.53	6.1851	3.4	0.0724	5.4	996	109	975	40	966
14RL011a L 15 43	10	1	50	40	11	0.79	1224	1.679	6.6	0.1621	4.8	0.73	6.1671	4.8	0.0751	4.5	1071	91	1001	42	969
14RL011a L 16 38	3	1	37	20	11	0.54	1454	2.923	5.1	0.2367	3.1	0.61	4.2254	3.1	0.0896	4.1	1417	78	1388	39	1369
14RL011a L 17 36	-3	1	38	24	8	0.64	230	1.632	6.1	0.1663	3.9	0.64	6.0136	3.9	0.0712	4.7	962	96	983	39	992

14RL011a L 18	1	62	40	16	0.64	362	2.288	5.7	0.2034	4.8	0.84	4.9165	4.8	0.0816	3.1	1236	60	1209	40	1194	52	3
14RL011a L 24	1	155	57	55	0.36	1404	4.299	3.4	0.2935	3.2	0.94	3.4071	3.2	0.1062	1.1	1736	21	1693	28	1659	47	4
14RL011a L 27	1	94	101	40	1.08	697	4.191	5.2	0.2975	4.6	0.89	3.3614	4.6	0.1022	2.4	1664	44	1672	42	1679	68	-1
14RL011a L 28	1	75	96	50	1.28	1676	9.019	4.5	0.4385	4.1	0.93	2.2803	4.1	0.1492	1.7	2336	29	2340	41	2344	81	0
14RL011a L 29	1	42	14	13	0.34	477	3.104	4.7	0.2482	4.0	0.85	4.0282	4.0	0.0907	2.5	1440	47	1434	36	1429	51	1
14RL011a L 30	1	187	98	60	0.52	4204	3.307	2.6	0.2600	2.0	0.78	3.8463	2.0	0.0922	1.6	1472	30	1483	20	1490	27	-1
14RL011a L 32	1	72	84	18	1.16	766	1.949	6.1	0.1794	2.8	0.45	5.5740	2.8	0.0788	5.4	1167	107	1098	41	1064	27	9
14RL011a L 33	1	199	85	49	0.43	1538	2.201	4.2	0.2034	3.7	0.87	4.9163	3.7	0.0785	2.1	1159	41	1181	29	1194	40	-3
14RL011a L 34	1	164	91	22	0.55	41185	0.887	5.8	0.1066	4.9	0.85	9.3798	4.9	0.0603	3.0	615	65	645	28	653	31	-6
14RL011a L 36	1	84	36	22	0.43	1023	2.506	5.1	0.2145	4.1	0.81	4.6619	4.1	0.0847	3.0	1310	58	1274	37	1253	47	4
14RL011a L 37	1	50	33	35	0.67	3421	12.923	3.8	0.5039	3.6	0.95	1.9845	3.6	0.1860	1.2	2707	20	2674	35	2631	77	3
14RL011a L 38	1	202	81	45	0.40	1591	1.921	4.0	0.1828	3.5	0.88	5.4703	3.5	0.0762	1.9	1101	37	1089	27	1082	35	2
14RL011a L 39	1	240	123	49	0.51	1197	1.750	3.3	0.1677	2.3	0.69	5.9628	2.3	0.0757	2.4	1087	48	1027	21	999	21	8
14RL011a L 40	1	379	121	84	0.32	10072	2.063	4.6	0.1881	4.4	0.95	5.3157	4.4	0.0795	1.4	1186	28	1137	32	1111	45	6
14RL011a L 42	1	5	11	5	2.12	142	13.097	7.2	0.5145	4.7	0.65	1.9437	4.7	0.1846	5.5	2695	91	2687	68	2676	103	1
14RL011a L 43	1	176	80	106	0.45	4492	10.117	2.8	0.4608	2.6	0.92	2.1700	2.6	0.1592	1.1	2447	19	2446	26	2443	53	0

14RL011a L 44	1	106	89	25	0.83	1008	1.779	4.7	0.1753	3.4	0.72	5.7060	3.4	0.0736	3.3	1032	67	1038	31	1041	33	-1
14RL011a L 45	1	296	125	67	0.42	44528	2.010	3.9	0.1864	3.6	0.91	5.3654	3.6	0.0782	1.6	1152	32	1119	27	1102	36	4
14RL011a L 46	1	151	73	45	0.48	5332	2.903	5.5	0.2411	5.0	0.92	4.1477	5.0	0.0873	2.1	1368	40	1383	41	1392	63	-2
14RL011a L 47	1	22	14	9	0.65	108	4.490	5.3	0.3099	3.6	0.68	3.2265	3.6	0.1051	3.9	1716	72	1729	44	1740	55	-1
14RL011a L 48	1	22	13	9	0.59	1106	5.102	5.5	0.3209	3.9	0.70	3.1159	3.9	0.1153	3.9	1884	71	1836	47	1794	61	5
14RL011a L 49	1	190	70	40	0.37	1041	1.778	5.6	0.1755	5.2	0.92	5.6984	5.2	0.0735	2.1	1028	43	1038	36	1042	50	-1
14RL011a L 52	1	66	36	20	0.55	1258	2.909	5.1	0.2341	4.0	0.79	4.2723	4.0	0.0901	3.1	1428	59	1384	38	1356	49	5
14RL011a L 54	1	160	81	105	0.51	10183	12.281	5.0	0.4954	4.7	0.94	2.0184	4.7	0.1798	1.7	2651	28	2626	47	2594	101	2
14RL011a L 55	1	74	43	22	0.58	2783	2.868	5.3	0.2304	3.7	0.70	4.3405	3.7	0.0903	3.8	1432	73	1374	40	1337	45	7
14RL011a L 56	1	145	79	45	0.55	12030	3.142	4.4	0.2480	4.0	0.91	4.0318	4.0	0.0919	1.8	1465	34	1443	34	1428	51	3
14RL011a L 58	1	88	72	20	0.82	927	1.713	4.7	0.1706	3.2	0.68	5.8600	3.2	0.0728	3.5	1009	71	1014	30	1016	30	-1
14RL011a L 59	1	75	36	18	0.48	461	2.026	5.4	0.1884	4.3	0.81	5.3069	4.3	0.0780	3.1	1146	62	1124	36	1113	44	3
14RL011a L 60	1	96	85	40	0.88	998	4.377	4.6	0.2943	4.1	0.89	3.3974	4.1	0.1078	2.1	1763	38	1708	38	1663	60	6
14RL011a L 61	1	87	88	21	1.02	613	1.772	5.5	0.1713	4.2	0.75	5.8380	4.2	0.0750	3.6	1069	73	1035	36	1019	39	5
14RL011a L 63	1	172	90	35	0.52	792	1.585	3.5	0.1602	3.2	0.91	6.2431	3.2	0.0718	1.5	980	30	964	22	958	28	2
14RL011a L 66	1	92	122	34	1.32	3562	3.064	4.5	0.2436	4.0	0.87	4.1052	4.0	0.0912	2.2	1451	43	1424	35	1405	50	3

14RL011a L 67	1	17	8	12	0.43	244	13.253	5.5	0.5105	4.8	0.86	1.9587	4.8	0.1883	2.8	2727	47	2698	52	2659	104	2
14RL011a L 68	1	29	30	7	1.05	260	1.703	5.2	0.1717	3.6	0.70	5.8242	3.6	0.0719	3.7	984	76	1010	33	1021	34	-4
14RL011a L 69	1	229	298	175	1.30	76563	12.111	5.2	0.4921	5.1	0.99	2.0320	5.1	0.1785	0.8	2639	14	2613	49	2580	109	2
14RL011a L 71	1	60	32	15	0.54	1146	2.248	5.5	0.2012	4.6	0.84	4.9712	4.6	0.0810	2.9	1223	58	1196	39	1182	50	3
14RL011a L 72	1	246	106	74	0.43	3550	3.115	3.2	0.2479	2.6	0.81	4.0345	2.6	0.0911	1.9	1450	35	1436	25	1427	33	2
14RL011a L 73	1	126	54	32	0.43	1412	2.628	5.5	0.2165	4.6	0.84	4.6185	4.6	0.0880	3.0	1383	57	1308	40	1263	53	9
14RL011a L 74	1	115	67	36	0.59	3826	3.083	4.5	0.2479	3.9	0.86	4.0332	3.9	0.0902	2.3	1429	43	1428	35	1428	50	0
14RL011a L 75	1	196	129	26	0.66	3981	0.874	5.1	0.1035	4.7	0.92	9.6619	4.7	0.0612	2.0	647	43	638	24	635	28	2
14RL011a L 76	1	59	27	13	0.45	1026	2.030	4.7	0.1851	4.0	0.83	5.4016	4.0	0.0795	2.6	1186	52	1126	32	1095	40	8
14RL011a L 77	1	58	42	14	0.73	455	1.866	6.3	0.1823	4.3	0.67	5.4862	4.3	0.0742	4.7	1048	94	1069	42	1079	42	-3
14RL011a L 79	1	104	95	84	0.91	5186	14.683	4.4	0.5508	4.1	0.94	1.8156	4.1	0.1933	1.5	2771	25	2795	42	2828	94	-2
14RL011a L 82	1	99	56	13	0.57	1283	0.919	5.5	0.1066	3.3	0.61	9.3769	3.3	0.0625	4.3	691	92	662	27	653	21	6
14RL011a L 84	1	87	57	19	0.66	314	1.641	5.7	0.1632	4.5	0.79	6.1281	4.5	0.0729	3.5	1012	71	986	36	974	41	4
14RL011a L 85	1	43	20	12	0.48	2906	2.784	5.1	0.2308	4.2	0.84	4.3324	4.2	0.0875	2.8	1371	53	1351	38	1339	51	2
14RL011a L 86	1	69	32	15	0.47	1255	1.920	4.9	0.1811	2.5	0.52	5.5226	2.5	0.0769	4.1	1119	83	1088	32	1073	25	4
14RL011a L 87	1	55	59	15	1.06	451	2.098	5.7	0.1888	4.5	0.79	5.2952	4.5	0.0806	3.5	1211	68	1148	39	1115	47	8

14RL011a L 88	1	111	79	37	0.72	1386	3.209	5.2	0.2516	4.5	0.87	3.9749	4.5	0.0925	2.5	1478	48	1459	40	1447	59	2
14RL011a L 89	1	240	79	69	0.33	5196	2.915	3.1	0.2409	2.6	0.82	4.1507	2.6	0.0878	1.8	1377	34	1386	24	1392	32	-1
14RL011a L 91	1	71	28	14	0.40	1589	1.617	6.5	0.1605	4.9	0.77	6.2295	4.9	0.0731	4.2	1016	84	977	41	960	44	6
14RL011a L 93	1	143	44	29	0.31	976	1.697	4.9	0.1707	4.6	0.93	5.8592	4.6	0.0721	1.9	989	38	1007	31	1016	43	-3
14RL011a L 94	1	64	38	9	0.60	856	0.937	6.0	0.1096	4.1	0.68	9.1280	4.1	0.0621	4.4	676	94	672	29	670	26	1
14RL011a L 98	1	102	230	83	2.25	993	10.350	5.2	0.4448	5.0	0.97	2.2484	5.0	0.1688	1.2	2546	21	2467	48	2372	99	7
14RL011a L 99	1	102	53	21	0.52	1271	1.700	4.0	0.1726	2.9	0.72	5.7944	2.9	0.0715	2.7	971	56	1009	25	1026	27	-6
14RL011a L 100	1	67	53	16	0.78	838	1.913	5.2	0.1831	3.3	0.63	5.4604	3.3	0.0757	4.1	1088	82	1086	35	1084	33	0
14RL011a L 101	1	92	80	31	0.86	4434	3.140	4.9	0.2472	4.3	0.88	4.0455	4.3	0.0921	2.3	1470	44	1442	38	1424	55	3
14RL011a L 102	1	225	86	65	0.38	3386	2.930	5.3	0.2433	4.9	0.93	4.1101	4.9	0.0874	1.9	1368	37	1390	40	1404	62	-3
14RL011a L 103	1	113	66	33	0.58	2309	2.729	6.6	0.2275	6.1	0.92	4.3953	6.1	0.0870	2.6	1360	49	1336	49	1321	73	3
14RL011a L 105	1	148	96	34	0.65	3119	1.871	4.9	0.1752	4.0	0.82	5.7073	4.0	0.0775	2.8	1133	55	1071	32	1041	39	8
14RL011a L 106	1	33	13	8	0.40	241	1.986	7.8	0.1915	6.9	0.88	5.2209	6.9	0.0752	3.6	1074	73	1111	53	1130	72	-5
14RL011a S 107	1	56	64	15	1.14	1259	1.863	5.4	0.1826	4.6	0.85	5.4762	4.6	0.0740	2.8	1042	56	1068	35	1081	46	-4
14RL011a S 108	1	210	122	28	0.58	1735	0.941	5.1	0.1072	4.5	0.89	9.3324	4.5	0.0637	2.4	732	50	674	25	656	28	10
14RL011a S 109	1	313	127	79	0.41	3884	2.286	4.5	0.2083	4.2	0.94	4.8018	4.2	0.0796	1.5	1188	29	1208	32	1220	47	-3

14RL011a S 110	1	143	146	38	1.02	12808	2.066	3.3	0.1907	2.7	0.82	5.2441	2.7	0.0786	1.9	1162	37	1138	23	1125	28	3
14RL011a S 111	1	29	24	8	0.82	149	2.312	6.4	0.2060	4.3	0.67	4.8535	4.3	0.0814	4.7	1231	93	1216	45	1208	47	2
14RL011a S 112	1	141	101	36	0.72	13728	2.121	4.6	0.1980	4.0	0.88	5.0498	4.0	0.0777	2.2	1139	43	1156	31	1165	43	-2
14RL011a S 114	1	135	63	37	0.47	2761	2.693	4.9	0.2291	4.0	0.82	4.3646	4.0	0.0853	2.8	1321	54	1327	36	1330	48	-1
14RL011a S 115	1	267	187	100	0.70	2090	4.207	3.3	0.2903	3.1	0.96	3.4446	3.1	0.1051	1.0	1716	18	1675	27	1643	45	4
14RL011a S 116	1	74	70	23	0.96	259	2.803	3.9	0.2363	3.2	0.82	4.2311	3.2	0.0860	2.3	1339	44	1356	29	1368	39	-2
14RL011a S 117	1	174	114	51	0.66	1264	2.782	4.2	0.2353	3.9	0.92	4.2494	3.9	0.0857	1.6	1332	32	1351	32	1362	48	-2
14RL011a S 118	1	35	14	10	0.39	188	2.645	7.3	0.2172	5.3	0.73	4.6031	5.3	0.0883	5.0	1389	96	1313	54	1267	61	9
14RL011a S 119	1	30	24	7	0.80	255	1.850	6.8	0.1742	4.5	0.67	5.7418	4.5	0.0770	5.0	1122	101	1063	45	1035	43	8
14RL011a S 120	1	132	168	23	1.28	2969	0.995	5.4	0.1153	4.1	0.77	8.6730	4.1	0.0626	3.5	695	74	701	27	703	28	-1
14RL011a S 121	1	316	103	79	0.32	6954	2.350	4.3	0.2095	4.2	0.98	4.7730	4.2	0.0814	0.9	1230	18	1228	31	1226	47	0
14RL011a S 125	1	114	63	35	0.55	781	2.974	4.2	0.2390	3.4	0.81	4.1850	3.4	0.0903	2.5	1431	47	1401	32	1381	42	3
14RL011a S 126	1	140	90	33	0.64	1431	1.952	3.9	0.1871	3.3	0.85	5.3451	3.3	0.0757	2.0	1086	40	1099	26	1106	33	-2
14RL011a S 127	1	89	52	29	0.58	2692	3.155	5.1	0.2544	4.7	0.91	3.9313	4.7	0.0899	2.1	1424	40	1446	40	1461	61	-3
14RL011a S 128	1	58	34	13	0.60	826	1.763	6.0	0.1747	4.5	0.76	5.7256	4.5	0.0732	3.9	1020	79	1032	39	1038	43	-2
14RL011a S 129	1	398	196	87	0.49	2623	1.767	3.9	0.1734	3.7	0.95	5.7668	3.7	0.0739	1.2	1039	23	1033	25	1031	35	1

14RL011a S 131	2	197	56	55	0.28	6974	2.919	3.6	0.2336	3.3	0.92	4.2814	3.3	0.0906	1.4	1439	28	1387	27	1353	40	6
14RL011a S 137	2	140	75	53	0.54	1614	4.328	4.5	0.3011	4.3	0.95	3.3213	4.3	0.1043	1.4	1701	26	1699	37	1697	64	0
14RL011a S 138	2	155	82	21	0.53	1542	0.951	4.1	0.1118	2.9	0.70	8.9465	2.9	0.0617	2.9	664	62	679	20	683	19	-3
14RL011a S 139	2	237	69	50	0.29	15071	1.823	5.2	0.1793	4.9	0.94	5.5777	4.9	0.0737	1.7	1034	35	1054	34	1063	48	-3
14RL011a S 140	2	307	159	72	0.52	1503	2.098	3.8	0.1934	3.3	0.87	5.1702	3.3	0.0787	1.9	1163	37	1148	26	1140	34	2
14RL011a S 141	2	26	45	22	1.77	1537	13.311	4.4	0.5381	3.8	0.86	1.8584	3.8	0.1794	2.3	2647	37	2702	41	2776	85	-5
14RL011a S 142	2	148	82	42	0.55	2574	2.721	4.0	0.2286	3.7	0.93	4.3741	3.7	0.0863	1.5	1345	29	1334	30	1327	45	1
14RL011a S 143	2	258	104	52	0.40	1994	1.715	3.9	0.1694	3.1	0.81	5.9041	3.1	0.0734	2.2	1026	45	1014	25	1009	29	2
14RL011a S 144	2	51	33	13	0.64	2299	2.169	4.2	0.1976	2.8	0.65	5.0597	2.8	0.0796	3.2	1187	63	1171	29	1163	29	2
14RL011a S 145	2	46	43	10	0.93	463	1.632	6.8	0.1630	4.5	0.67	6.1356	4.5	0.0726	5.1	1004	103	983	43	973	41	3
14RL011a S 146	2	59	38	19	0.64	763	3.200	4.9	0.2554	3.1	0.63	3.9154	3.1	0.0909	3.8	1444	73	1457	38	1466	41	-2
14RL011a S 147	2	168	172	71	1.02	#DIV/0!	4.557	4.7	0.3058	4.4	0.93	3.2705	4.4	0.1081	1.8	1768	32	1741	39	1720	66	3
14RL011a S 148	2	98	54	30	0.55	2179	3.228	3.2	0.2551	2.7	0.83	3.9194	2.7	0.0917	1.8	1462	35	1464	25	1465	35	0
14RL011a S 149	2	166	166	55	1.00	1724	3.136	3.6	0.2469	2.9	0.81	4.0508	2.9	0.0921	2.1	1470	39	1442	27	1422	37	3
14RL011a S 153	2	119	136	49	1.15	1596	4.041	5.2	0.2933	4.8	0.91	3.4098	4.8	0.0999	2.2	1623	40	1642	43	1658	70	-2
14RL011a S 154	2	181	95	51	0.52	633	2.742	4.1	0.2265	3.6	0.90	4.4156	3.6	0.0878	1.8	1379	34	1340	30	1316	43	5

14RL011a S 155	2	98	54	30	0.55	2179	3.228	3.2	0.2551	2.7	0.83	3.9194	2.7	0.0917	1.8	1462	35	1464	25	1465	35	0
14RL011a S 156	2	166	166	55	1.00	1724	3.137	3.4	0.2470	2.7	0.81	4.0490	2.7	0.0921	2.0	1470	38	1442	26	1423	35	3
14RL011a S 157	2	119	136	49	1.15	1596	4.041	5.2	0.2933	4.8	0.91	3.4098	4.8	0.0999	2.2	1623	40	1642	43	1658	70	-2
14RL011a S 160	2	181	95	51	0.52	633	2.744	4.2	0.2266	3.8	0.90	4.4134	3.8	0.0878	1.8	1379	35	1340	31	1317	45	5
>10% discordant																						
14RL011a L 22	1	34	67	13	1.96	547	2.652	7.5	0.2126	5.5	0.73	4.7027	5.5	0.0904	5.1	1435	97	1315	55	1243	62	13
14RL011a L 41	1	239	94	30	0.39	542	1.007	8.4	0.0996	8.1	0.97	10.0438	8.1	0.0733	2.0	1024	40	707	43	612	47	40
14RL011a L 53	1	168	134	95	0.80	2043	9.285	6.2	0.3834	6.1	0.98	2.6083	6.1	0.1756	1.2	2612	20	2367	57	2092	108	20
14RL011a L 62	1	140	55	51	0.39	2415	4.732	2.6	0.2960	2.0	0.76	3.3784	2.0	0.1160	1.7	1895	31	1773	22	1671	29	12
14RL011a L 64	1	316	403	185	1.28	27263	8.785	5.9	0.3754	5.8	0.99	2.6637	5.8	0.1697	0.8	2555	13	2316	53	2055	102	20
14RL011a S 113	1	83	59	23	0.72	1312	2.290	4.3	0.2147	2.4	0.55	4.6576	2.4	0.0773	3.6	1130	72	1209	30	1254	27	-11

		Composition							**Corrected isotope ratios**									**Apparent ages (Ma)**				
Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{235}U$	±2s (%)	$^{206}Pb/^{238}U$	±2s (%)	error corr.	$^{238}U/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (abs)	$^{207}Pb/^{235}U$	±2s (abs)	$^{206}Pb/^{238}U$	±2s (abs)	% disc.
BC14-01																						
<10% discordant																						
BC14-01 L 2	1	12	7	2	0.62	61	1.980	17.9	0.1856	8.3	0.47	5.3887	8.3	0.0774	15.9	1131	316	1109	121	1097	84	3

BC14-01 L 3 1 7	39	17	8	0.43	230	2.157	9.7	0.1929	6.1	0.63	5.1827	6.1	0.0811	7.5	1223	148	1167	67	1137	64
BC14-01 L 4 1 -8	28	10	6	0.35	248	2.143	13.5	0.2031	6.8	0.50	4.9228	6.8	0.0765	11.7	1109	234	1163	94	1192	74
BC14-01 L 5 1 -9	43	22	8	0.52	585	1.656	12.8	0.1713	7.0	0.55	5.8373	7.0	0.0701	10.7	931	220	992	81	1019	66
BC14-01 L 6 1 3	48	27	9	0.56	507	1.818	9.9	0.1754	7.8	0.79	5.7009	7.8	0.0752	6.1	1073	122	1052	65	1042	75
BC14-01 L 7 1 1	201	108	51	0.54	1546	1.934	8.8	0.1842	7.7	0.87	5.4292	7.7	0.0762	4.3	1099	86	1093	59	1090	77
BC14-01 L 101 -1	90	39	22	0.43	1159	2.409	9.7	0.2139	8.0	0.83	4.6741	8.0	0.0817	5.5	1237	108	1245	70	1250	91
BC14-01 L 131 6	158	44	33	0.28	771	1.928	7.8	0.1802	6.3	0.81	5.5490	6.3	0.0776	4.6	1136	91	1091	52	1068	62
BC14-01 L 141 10	160	55	33	0.35	20769	1.895	7.4	0.1751	6.2	0.85	5.7113	6.2	0.0785	3.9	1159	78	1079	49	1040	60
BC14-01 L 251 -4	69	27	14	0.39	1091	1.882	7.2	0.1841	4.9	0.69	5.4314	4.9	0.0742	5.2	1046	105	1075	48	1089	50
BC14-01 L 281 -4	52	28	11	0.53	299	1.877	7.6	0.1837	5.1	0.67	5.4448	5.1	0.0741	5.6	1044	113	1073	50	1087	51
BC14-01 L 371 -10	13	13	3	1.05	67	2.040	12.9	0.1985	7.9	0.61	5.0388	7.9	0.0746	10.3	1056	206	1129	88	1167	84
BC14-01 L 391 -5	139	69	32	0.50	593	1.957	11.2	0.1896	9.3	0.83	5.2749	9.3	0.0749	6.2	1065	126	1101	75	1119	95
BC14-01 L 401 -5	127	64	27	0.51	576	1.845	8.5	0.1822	5.4	0.64	5.4874	5.4	0.0734	6.5	1025	131	1061	56	1079	54
BC14-01 L 441 6	122	82	25	0.67	11852	1.653	7.5	0.1625	5.5	0.74	6.1554	5.5	0.0738	5.0	1036	102	991	47	970	50
BC14-01 L 461 -3	68	22	14	0.32	406	1.937	6.9	0.1871	4.5	0.65	5.3457	4.5	0.0751	5.3	1072	105	1094	46	1105	45
BC14-01 L 471 6	331	94	86	0.28	3719	2.542	10.4	0.2147	10.0	0.96	4.6572	10.0	0.0859	3.0	1335	58	1284	76	1254	114

BC14-01 L 521 10	322	187	97	0.58	30386	2.947	4.2	0.2300	3.6	0.85	4.3476	3.6	0.0929	2.2	1486	42	1394	32	1335	43
BC14-01 L 541 -3	80	47	17	0.59	2855	1.889	8.1	0.1837	5.4	0.67	5.4431	5.4	0.0746	6.0	1057	122	1077	54	1087	54
BC14-01 L 551 9	79	53	17	0.67	717	1.964	7.5	0.1803	5.5	0.73	5.5449	5.5	0.0790	5.1	1171	101	1103	50	1069	54
BC14-01 L 571 -2	54	34	15	0.64	536	2.805	7.3	0.2362	5.5	0.76	4.2343	5.5	0.0861	4.8	1341	92	1357	55	1367	68
BC14-01 L 591 10	137	58	28	0.43	2399	1.815	6.5	0.1707	5.1	0.77	5.8586	5.1	0.0771	4.1	1124	82	1051	43	1016	48
BC14-01 L 611 9	394	162	105	0.41	1351	2.588	3.9	0.2142	3.6	0.91	4.6685	3.6	0.0876	1.6	1374	31	1297	29	1251	41
BC14-01 L 621 2	65	19	13	0.29	504	1.937	7.8	0.1834	4.3	0.55	5.4520	4.3	0.0766	6.5	1111	130	1094	52	1086	43
BC14-01 L 631 3	76	17	16	0.23	7012	2.198	7.5	0.1987	5.2	0.69	5.0330	5.2	0.0802	5.4	1202	106	1180	52	1168	55
BC14-01 L 641 1	65	25	14	0.38	7986	2.030	7.5	0.1900	4.7	0.62	5.2620	4.7	0.0775	5.9	1133	117	1126	51	1122	48
BC14-01 L 691 7	93	47	20	0.51	757	2.058	7.4	0.1869	4.4	0.59	5.3492	4.4	0.0798	6.0	1193	118	1135	51	1105	44
BC14-01 L 721 -5	64	59	16	0.93	756	2.208	8.7	0.2053	6.1	0.70	4.8699	6.1	0.0780	6.2	1146	123	1184	61	1204	67
BC14-01 L 731 9	107	58	30	0.54	1348	2.890	10.3	0.2292	8.8	0.85	4.3626	8.8	0.0914	5.4	1456	102	1379	78	1330	106
BC14-01 L 741 3	155	54	34	0.35	949	1.996	11.4	0.1866	9.6	0.84	5.3587	9.6	0.0776	6.2	1136	124	1114	77	1103	97
BC14-01 L 751 10	96	50	26	0.52	1391	2.764	8.1	0.2214	6.4	0.79	4.5165	6.4	0.0905	5.0	1437	94	1346	60	1289	74
BC14-01 L 761 4	117	59	26	0.51	542	2.003	8.0	0.1862	5.6	0.70	5.3719	5.6	0.0780	5.7	1148	113	1116	54	1100	57
BC14-01 L 791 -9	87	47	20	0.54	434	2.056	6.5	0.1983	4.8	0.73	5.0417	4.8	0.0752	4.5	1073	90	1134	45	1166	51

BC14-01 L 811 10	156	55	35	0.36	1114	2.102	8.9	0.1874	6.5	0.73	5.3353	6.5	0.0813	6.0	1229	118	1149	61	1107	66
BC14-01 L 831 5	201	95	44	0.47	2170	1.856	5.4	0.1762	4.7	0.86	5.6765	4.7	0.0764	2.8	1106	56	1066	36	1046	45
BC14-01 L 861 -5	174	96	40	0.55	10072	1.830	8.8	0.1811	5.8	0.67	5.5222	5.8	0.0733	6.5	1022	132	1056	57	1073	58
BC14-01 L 871 -10	132	33	27	0.25	1425	1.867	9.0	0.1867	6.9	0.77	5.3571	6.9	0.0725	5.7	1001	116	1069	59	1103	70
BC14-01 L 891 -2	68	40	14	0.58	2643	1.849	8.3	0.1805	4.9	0.59	5.5410	4.9	0.0743	6.7	1050	136	1063	55	1070	48
BC14-01 L 921 10	38	21	9	0.56	105	2.418	12.6	0.2049	8.0	0.64	4.8795	8.0	0.0856	9.8	1328	189	1248	91	1202	88
BC14-01 L 931 -1	213	115	83	0.54	2415	4.291	7.3	0.3017	6.6	0.90	3.3147	6.6	0.1032	3.1	1682	58	1692	60	1700	99
BC14-01 L 961 1	59	75	23	1.28	903	3.526	8.7	0.2675	6.8	0.78	3.7379	6.8	0.0956	5.5	1540	103	1533	69	1528	93
BC14-01 L 101 51 7	1	82	31	17	0.38	954	2.007	7.1	0.1841	5.1	0.71	5.4327	5.1	0.0791	5.0	1174	99	1118	48	1089
BC14-01 L 102 58 3	1	97	38	20	0.39	394	1.884	8.1	0.1793	5.9	0.73	5.5784	5.9	0.0762	5.5	1101	111	1075	54	1063
BC14-01 S 108 61 9	1	109	30	23	0.28	709	2.115	7.8	0.1891	6.0	0.77	5.2892	6.0	0.0811	5.0	1225	99	1154	54	1116
BC14-01 S 111 90 10	1	348	112	85	0.32	582	2.368	9.3	0.2015	8.3	0.89	4.9638	8.3	0.0852	4.2	1321	81	1233	67	1183
BC14-01 S 112 60 -3	1	76	58	17	0.77	271	1.956	8.7	0.1882	5.9	0.68	5.3124	5.9	0.0754	6.4	1078	128	1100	58	1112
BC14-01 S 120 53 2	2	84	38	17	0.46	1130	1.869	7.8	0.1793	5.4	0.69	5.5779	5.4	0.0756	5.7	1085	113	1070	52	1063
BC14-01 S 121 77 1	2	50	37	16	0.74	2764	3.468	7.7	0.2644	5.7	0.74	3.7817	5.7	0.0951	5.2	1530	98	1520	61	1512
BC14-01 S 122 79 5	2	106	128	28	1.21	835	2.340	9.6	0.2051	7.2	0.75	4.8755	7.2	0.0827	6.4	1263	125	1224	68	1203

BC14-01 S 123	2	298	95	61	0.32	3160	1.846	5.3	0.1740	4.8	0.91	5.7456	4.8	0.0769	2.2	1119	45	1062	35	1034	46	8
BC14-01 S 126	2	59	55	14	0.94	541	2.027	7.7	0.1918	5.9	0.76	5.2149	5.9	0.0767	5.0	1113	99	1125	52	1131	61	-2
BC14-01 S 127	2	52	58	11	1.12	580	1.710	8.9	0.1661	4.8	0.54	6.0210	4.8	0.0747	7.5	1059	151	1012	57	991	44	7
BC14-01 S 131	2	101	57	29	0.56	248	2.801	9.0	0.2396	7.7	0.86	4.1739	7.7	0.0848	4.6	1311	90	1356	67	1385	96	-6
BC14-01 S 133	2	90	41	27	0.46	9993	3.028	9.9	0.2558	9.2	0.92	3.9097	9.2	0.0859	3.8	1335	74	1415	76	1468	120	-10
BC14-01 S 135	2	65	75	26	1.15	707	4.220	7.5	0.2892	5.8	0.78	3.4578	5.8	0.1058	4.7	1729	87	1678	61	1638	84	5
BC14-01 S 143	2	43	40	10	0.95	1020	1.894	11.5	0.1829	5.0	0.43	5.4665	5.0	0.0751	10.3	1071	208	1079	76	1083	49	-1
BC14-01 S 144	2	84	62	21	0.74	2588	2.203	7.2	0.2041	5.9	0.82	4.8999	5.9	0.0783	4.2	1154	83	1182	51	1197	65	-4
BC14-01 S 146	2	60	23	14	0.37	452	2.371	8.6	0.2037	6.1	0.71	4.9102	6.1	0.0844	6.1	1303	118	1234	62	1195	67	8
BC14-01 S 149	2	219	156	67	0.71	1733	2.862	5.4	0.2329	4.4	0.81	4.2942	4.4	0.0891	3.1	1407	60	1372	41	1350	54	4
BC14-01 S 151	2	331	116	69	0.35	4046	1.835	6.2	0.1772	5.5	0.88	5.6426	5.5	0.0751	3.0	1071	60	1058	41	1052	53	2
BC14-01 S 153	2	114	96	25	0.84	1404	1.697	8.2	0.1721	5.9	0.71	5.8103	5.9	0.0715	5.8	972	118	1008	53	1024	55	-5
BC14-01 S 160	2	94	66	23	0.70	841	2.093	6.7	0.1993	5.1	0.76	5.0173	5.1	0.0762	4.4	1100	87	1147	46	1172	55	-7
BC14-01 S 165	2	223	231	69	1.04	2716	2.701	5.7	0.2190	4.9	0.86	4.5663	4.9	0.0895	2.9	1414	55	1329	42	1277	57	10
BC14-01 S 167	2	201	130	58	0.65	3171	2.727	6.9	0.2258	6.0	0.87	4.4294	6.0	0.0876	3.4	1374	65	1336	51	1312	72	4
BC14-01 S 170	2	327	84	65	0.26	3399	1.823	7.2	0.1721	5.7	0.79	5.8118	5.7	0.0768	4.4	1117	88	1054	47	1023	54	8

BC14-01 S 171	2	83	46	18	0.56	4164	1.938	8.5	0.1806	6.6	0.78	5.5375	6.6	0.0778	5.3	1142	106	1094	57	1070	65	6
BC14-01 S 173	2	123	43	26	0.35	1116	1.983	6.3	0.1833	4.8	0.77	5.4555	4.8	0.0785	4.0	1159	80	1110	42	1085	48	6
BC14-01 S 174	2	54	34	15	0.63	537	2.941	7.8	0.2348	4.8	0.61	4.2595	4.8	0.0908	6.2	1443	118	1392	59	1359	59	6
BC14-01 S 176	2	174	67	34	0.38	2697	1.676	6.0	0.1625	4.7	0.79	6.1550	4.7	0.0748	3.7	1063	74	999	38	970	42	9
BC14-01 S 177	2	82	34	18	0.41	735	2.095	7.0	0.1957	5.5	0.78	5.1088	5.5	0.0776	4.3	1137	86	1147	48	1152	58	-1
BC14-01 S 178	2	30	36	8	1.22	240	2.109	9.1	0.2028	6.0	0.65	4.9310	6.0	0.0754	6.9	1080	139	1152	63	1190	65	-10
BC14-01 S 180	2	106	46	30	0.43	15934	2.997	6.4	0.2392	4.7	0.72	4.1811	4.7	0.0909	4.4	1444	85	1407	49	1382	58	4
BC14-01 S 181	2	71	34	14	0.48	647	1.671	6.1	0.1702	4.5	0.74	5.8763	4.5	0.0712	4.1	964	84	998	39	1013	42	-5
BC14-01 S 183	2	81	32	17	0.40	1636	2.016	8.0	0.1844	6.1	0.76	5.4222	6.1	0.0793	5.2	1179	102	1121	54	1091	62	7
BC14-01 S 184	2	84	38	18	0.46	1594	1.974	7.8	0.1827	6.0	0.78	5.4745	6.0	0.0784	4.9	1156	97	1107	52	1082	60	6
BC14-01 S 186	2	479	211	118	0.44	6771	2.199	9.4	0.2015	8.8	0.94	4.9628	8.8	0.0791	3.1	1176	61	1181	65	1183	95	-1
BC14-01 S 188	2	133	47	29	0.35	885	1.975	7.0	0.1909	5.3	0.75	5.2390	5.3	0.0750	4.6	1070	92	1107	47	1126	54	-5
BC14-01 S 191	2	184	83	42	0.45	776	1.962	9.0	0.1900	5.6	0.63	5.2634	5.6	0.0749	7.0	1065	140	1102	60	1121	58	-5
BC14-01 S 194	2	189	87	49	0.46	987069	2.335	11.8	0.2044	9.2	0.78	4.8921	9.2	0.0829	7.3	1266	143	1223	84	1199	101	5
BC14-01 S 195	2	239	86	52	0.36	6095	1.871	7.8	0.1822	6.9	0.88	5.4876	6.9	0.0745	3.6	1055	73	1071	51	1079	68	-2
BC14-01 S 196	2	194	100	45	0.51	7608	1.978	6.2	0.1886	5.4	0.87	5.3028	5.4	0.0761	3.0	1097	61	1108	42	1114	55	-1

BC14-01 S 197	2	92	45	25	0.49	48660	2.813	7.0	0.2333	4.9	0.71	4.2867	4.9	0.0875	4.9	1371	95	1359	52	1352	60	1
BC14-01 S 198	2	303	136	66	0.45	15910	1.905	5.1	0.1802	4.6	0.91	5.5495	4.6	0.0767	2.2	1113	43	1083	34	1068	45	4
BC14-01 S 199	2	208	117	59	0.56	2481	2.846	5.0	0.2276	4.4	0.88	4.3940	4.4	0.0907	2.4	1440	46	1368	38	1322	53	8
BC14-01 S 202	2	212	145	58	0.68	3633	2.520	7.6	0.2119	7.3	0.96	4.7201	7.3	0.0863	2.2	1344	42	1278	55	1239	82	8
BC14-01 S 203	2	265	93	57	0.35	12671	1.899	5.2	0.1809	4.2	0.80	5.5271	4.2	0.0761	3.1	1099	62	1081	35	1072	41	2
BC14-01 S 204	2	87	79	26	0.91	3177	2.786	6.8	0.2271	4.9	0.72	4.4033	4.9	0.0890	4.7	1403	91	1352	51	1319	59	6
BC14-01 S 205	2	182	68	54	0.38	2749	2.984	8.4	0.2402	7.2	0.86	4.1629	7.2	0.0901	4.3	1427	82	1403	64	1388	90	3
BC14-01 S 206	2	117	44	34	0.38	7905	3.016	7.3	0.2444	6.1	0.84	4.0909	6.1	0.0895	4.0	1415	76	1412	55	1410	77	0
BC14-01 S 209	2	74	30	19	0.41	572	2.620	8.3	0.2200	7.0	0.85	4.5453	7.0	0.0864	4.4	1346	85	1306	61	1282	82	5
BC14-01 S 210	2	83	47	19	0.56	2068	2.239	6.5	0.1964	4.6	0.72	5.0919	4.6	0.0827	4.5	1262	88	1193	45	1156	49	8
BC14-01 S 211	2	209	109	46	0.52	1534	1.914	7.1	0.1773	6.0	0.85	5.6415	6.0	0.0783	3.8	1155	75	1086	47	1052	58	9
BC14-01 S 212	2	99	70	24	0.70	2845	2.129	7.1	0.1967	5.5	0.77	5.0850	5.5	0.0785	4.5	1160	90	1158	49	1157	58	0
BC14-01 S 213	2	56	26	13	0.45	530	2.165	9.1	0.2028	5.8	0.64	4.9317	5.8	0.0774	7.0	1132	139	1170	63	1190	63	-5
BC14-01 S 214	2	81	65	20	0.81	742	2.181	9.8	0.1977	7.1	0.72	5.0591	7.1	0.0800	6.9	1198	135	1175	69	1163	75	3
BC14-01 S 215	2	124	53	26	0.43	4248	1.883	7.4	0.1807	6.3	0.84	5.5335	6.3	0.0756	4.0	1084	81	1075	49	1071	62	1
BC14-01 S 218	2	71	33	16	0.47	3034	2.018	7.5	0.1948	5.3	0.70	5.1330	5.3	0.0751	5.4	1071	108	1121	51	1147	56	-7

BC14-01 S 226	2	234	95	54	0.41	6987	2.028	7.6	0.1927	5.9	0.78	5.1894	5.9	0.0763	4.8	1104	96	1125	52	1136	62	-3
BC14-01 S 227	2	86	87	20	1.00	5272	1.987	13.1	0.1806	10.7	0.82	5.5364	10.7	0.0798	7.6	1192	149	1111	88	1070	105	10
>10% discordant																						
BC14-01 L 1 1	21	16	4	0.76	433	1.924	13.9	0.1746	7.8	0.56	5.7289	7.8	0.0799	11.5	1195	228	1089	93	1037	75	13	
BC14-01 L 100	1	495	241	108	0.49	3953	1.866	7.7	0.1723	6.9	0.90	5.8033	6.9	0.0785	3.3	1160	66	1069	51	1025	65	12
BC14-01 L 103	1	216	55	44	0.25	1401	1.968	5.3	0.1740	4.1	0.78	5.7457	4.1	0.0820	3.3	1246	65	1105	36	1034	40	17
BC14-01 L 104	1	82	30	16	0.37	586	2.117	7.7	0.1800	5.8	0.75	5.5550	5.8	0.0853	5.1	1322	99	1154	53	1067	57	19
BC14-01 L 111	184	105	56	0.57	2141	2.710	18.0	0.2830	17.0	0.94	3.5330	17.0	0.0694	6.0	912	124	1331	134	1607	242	-76	
BC14-01 L 121	67	20	15	0.30	97625	2.461	15.6	0.1876	7.5	0.48	5.3309	7.5	0.0952	13.7	1531	257	1261	113	1108	76	28	
BC14-01 L 151	198	142	52	0.72	3826	2.433	6.5	0.1919	5.5	0.85	5.2103	5.5	0.0919	3.4	1466	64	1252	46	1132	57	23	
BC14-01 L 161	174	128	50	0.73	1650	2.566	6.1	0.2065	4.5	0.74	4.8417	4.5	0.0901	4.1	1428	77	1291	44	1210	50	15	
BC14-01 L 171	126	27	25	0.21	1671	1.854	11.3	0.1860	9.1	0.80	5.3764	9.1	0.0723	6.7	994	136	1065	74	1100	92	-11	
BC14-01 L 181	603	45	120	0.08	3778	1.288	9.6	0.1129	9.1	0.94	8.8560	9.1	0.0827	3.2	1263	62	840	55	690	59	45	
BC14-01 L 191	192	90	41	0.47	3889	1.925	7.7	0.1630	5.3	0.68	6.1340	5.3	0.0856	5.6	1330	109	1090	52	974	48	27	
BC14-01 L 201	72	20	23	0.27	466	4.110	6.5	0.2734	5.4	0.84	3.6574	5.4	0.1090	3.5	1783	65	1656	53	1558	75	13	
BC14-01 L 211	68	19	22	0.29	845	4.279	8.6	0.2810	6.9	0.81	3.5589	6.9	0.1104	5.1	1807	92	1689	71	1596	98	12	

BC14-01 L 221	34	34	9	1.01	2831	2.866	9.6	0.2095	6.1	0.64	4.7725	6.1	0.0992	7.4	1609	138	1373	72	1226	69	24
BC14-01 L 231	33	32	9	0.98	185	2.343	7.8	0.1983	4.3	0.55	5.0432	4.3	0.0857	6.5	1331	126	1225	55	1166	45	12
BC14-01 L 241	266	60	49	0.23	26950	1.779	5.9	0.1588	4.8	0.81	6.2988	4.8	0.0813	3.5	1228	68	1038	39	950	43	23
BC14-01 L 261	222	129	49	0.58	1476	2.201	10.8	0.1639	8.5	0.79	6.1026	8.5	0.0974	6.6	1576	124	1182	75	978	77	38
BC14-01 L 271	158	50	37	0.32	1056	2.710	14.6	0.1724	4.2	0.29	5.8008	4.2	0.1140	14.0	1864	252	1331	108	1025	40	45
BC14-01 L 291	57	39	12	0.68	1457	2.087	9.4	0.1835	6.7	0.71	5.4495	6.7	0.0825	6.6	1257	129	1145	64	1086	67	14
BC14-01 L 301	107	56	26	0.52	1348	2.391	12.4	0.1925	5.0	0.40	5.1946	5.0	0.0901	11.4	1427	217	1240	89	1135	52	20
BC14-01 L 311	343	153	71	0.45	3591	1.749	4.7	0.1652	3.4	0.73	6.0545	3.4	0.0768	3.2	1116	64	1027	30	985	31	12
BC14-01 L 321	181	61	49	0.34	1810	2.992	5.5	0.2176	5.0	0.91	4.5959	5.0	0.0997	2.2	1619	41	1406	42	1269	58	22
BC14-01 L 331	239	41	48	0.17	17630	1.974	6.2	0.1772	4.6	0.75	5.6445	4.6	0.0808	4.1	1217	80	1107	41	1051	45	14
BC14-01 L 341	984	142	171	0.14	1393	1.833	5.1	0.1475	4.4	0.87	6.7778	4.4	0.0901	2.5	1427	47	1057	33	887	37	38
BC14-01 L 351	156	139	34	0.89	7474	1.787	7.2	0.1661	5.4	0.76	6.0209	5.4	0.0780	4.7	1148	93	1041	47	991	50	14
BC14-01 L 361	57	49	14	0.86	324	2.004	9.3	0.2007	6.6	0.72	4.9821	6.6	0.0724	6.5	997	131	1117	63	1179	72	-18
BC14-01 L 381	20	14	4	0.70	611	1.788	17.3	0.1956	6.2	0.36	5.1121	6.2	0.0663	16.2	815	339	1041	113	1152	65	-41
BC14-01 L 411	136	82	30	0.60	6267	2.234	10.2	0.1730	7.6	0.75	5.7819	7.6	0.0937	6.7	1501	127	1192	71	1028	73	32
BC14-01 L 421	193	107	49	0.55	10467	2.297	7.3	0.1953	6.2	0.85	5.1191	6.2	0.0853	3.8	1322	74	1211	51	1150	65	13

BC14-01 L 431	139	99	26	0.71	803	1.584	6.4	0.1466	4.6	0.72	6.8225	4.6	0.0784	4.4	1156	88	964	40	882	38	24
BC14-01 L 451	194	89	48	0.46	896	2.343	6.5	0.1954	4.8	0.74	5.1166	4.8	0.0869	4.4	1359	85	1225	46	1151	51	15
BC14-01 L 481	215	47	38	0.22	809	1.640	6.8	0.1511	4.7	0.69	6.6181	4.7	0.0787	4.9	1165	97	986	43	907	40	22
BC14-01 L 491	164	100	36	0.61	942	1.873	6.9	0.1687	5.8	0.84	5.9294	5.8	0.0805	3.8	1210	75	1071	46	1005	54	17
BC14-01 L 501	166	51	32	0.31	4075	1.766	8.0	0.1614	7.1	0.89	6.1972	7.1	0.0794	3.7	1181	74	1033	52	964	64	18
BC14-01 L 511	192	111	55	0.58	702	2.841	5.9	0.2189	5.3	0.90	4.5693	5.3	0.0942	2.6	1511	48	1367	44	1276	61	16
BC14-01 L 531	65	23	17	0.35	587	3.388	14.0	0.2143	10.1	0.72	4.6653	10.1	0.1146	9.7	1874	174	1502	110	1252	115	33
BC14-01 L 561	94	63	25	0.67	2285	2.648	7.2	0.2092	5.6	0.78	4.7806	5.6	0.0918	4.5	1463	86	1314	53	1224	63	16
BC14-01 L 581	108	72	24	0.67	4665	2.024	7.3	0.1721	5.3	0.74	5.8113	5.3	0.0853	4.9	1323	95	1124	49	1024	51	23
BC14-01 L 601	126	58	26	0.46	1662	1.837	6.6	0.1695	4.3	0.66	5.8999	4.3	0.0786	5.0	1162	99	1059	43	1009	41	13
BC14-01 L 651	146	52	30	0.36	365	1.979	6.9	0.1793	5.4	0.79	5.5757	5.4	0.0800	4.3	1197	84	1108	47	1063	53	11
BC14-01 L 661	192	67	37	0.35	1265	1.756	6.2	0.1589	4.7	0.75	6.2928	4.7	0.0802	4.1	1201	81	1030	40	951	42	21
BC14-01 L 671	168	50	39	0.30	1483	2.289	5.7	0.1931	4.0	0.70	5.1796	4.0	0.0860	4.1	1338	79	1209	40	1138	42	15
BC14-01 L 681	162	47	37	0.29	1887	2.312	5.1	0.1950	4.3	0.84	5.1272	4.3	0.0860	2.7	1337	53	1216	36	1149	45	14
BC14-01 L 701	68	35	14	0.52	2239	2.077	8.4	0.1850	5.1	0.61	5.4067	5.1	0.0814	6.6	1232	130	1141	57	1094	51	11
BC14-01 L 711	74	45	18	0.60	769	2.065	7.5	0.2108	6.3	0.84	4.7436	6.3	0.0710	4.0	958	82	1137	51	1233	71	-29

BC14-01 L 77	1	85	28	17	0.33	322	2.219	11.4	0.1787	7.8	0.68	5.5963	7.8	0.0901	8.4	1427	160	1187	80	1060	76	26
BC14-01 L 78	1	94	33	19	0.35	7107	1.932	8.6	0.1757	5.8	0.68	5.6930	5.8	0.0798	6.3	1191	124	1092	57	1043	56	12
BC14-01 L 8	1	119	30	22	0.26	19028	1.845	10.7	0.1707	5.7	0.53	5.8578	5.7	0.0784	9.1	1157	180	1062	71	1016	54	12
BC14-01 L 80	1	79	66	20	0.84	1496	2.527	14.3	0.1874	5.6	0.39	5.3369	5.6	0.0978	13.1	1583	245	1280	104	1107	57	30
BC14-01 L 82	1	251	188	59	0.75	574	2.183	8.5	0.1696	3.5	0.41	5.8969	3.5	0.0934	7.7	1495	147	1176	59	1010	33	32
BC14-01 L 85	1	56	32	12	0.57	548	1.830	11.2	0.1913	7.1	0.63	5.2282	7.1	0.0694	8.7	910	179	1056	74	1128	73	-24
BC14-01 L 9	1	165	54	31	0.32	1573	1.730	8.7	0.1617	6.9	0.79	6.1832	6.9	0.0776	5.4	1136	107	1020	56	966	62	15
BC14-01 L 90	1	107	159	24	1.48	506	1.710	8.8	0.1530	7.2	0.82	6.5347	7.2	0.0810	5.1	1222	99	1012	57	918	62	25
BC14-01 L 91	1	28	14	7	0.50	139	2.209	12.8	0.2157	8.6	0.68	4.6371	8.6	0.0743	9.4	1049	190	1184	89	1259	99	-20
BC14-01 L 94	1	224	113	76	0.51	4825	4.194	6.9	0.2708	6.0	0.87	3.6929	6.0	0.1123	3.4	1837	61	1673	56	1545	82	16
BC14-01 L 95	1	149	327	62	2.19	2905	2.938	8.8	0.2218	5.7	0.64	4.5076	5.7	0.0961	6.7	1549	126	1392	66	1292	66	17
BC14-01 L 97	1	201	105	43	0.52	9494	1.894	7.7	0.1654	6.5	0.84	6.0475	6.5	0.0831	4.2	1271	83	1079	51	986	59	22
BC14-01 L 98	1	191	88	41	0.46	4913	1.985	7.0	0.1720	5.9	0.85	5.8125	5.9	0.0837	3.8	1286	73	1111	47	1023	56	20
BC14-01 S 105	1	194	97	42	0.50	1591	1.963	8.9	0.1643	6.9	0.77	6.0860	6.9	0.0866	5.6	1352	109	1103	60	981	62	27
BC14-01 S 106	1	131	48	27	0.37	2059	1.982	8.7	0.1763	7.2	0.82	5.6706	7.2	0.0815	4.9	1234	97	1109	59	1047	69	15
BC14-01 S 107	1	121	33	25	0.27	5705	2.016	7.5	0.1814	6.5	0.86	5.5118	6.5	0.0806	3.8	1211	75	1121	51	1075	64	11

BC14-01 S 110	1	696	466	139	0.67	6925	1.736	7.8	0.1528	7.2	0.91	6.5454	7.2	0.0824	3.2	1255	62	1022	50	917	61	27
BC14-01 S 113	1	187	71	36	0.38	933	1.746	7.2	0.1611	6.0	0.84	6.2078	6.0	0.0786	3.8	1163	76	1026	46	963	54	17
BC14-01 S 114	1	131	139	27	1.06	1734	1.661	6.7	0.1521	4.5	0.67	6.5749	4.5	0.0792	4.9	1177	97	994	42	913	38	22
BC14-01 S 115	1	36	45	8	1.25	278	1.997	9.0	0.1763	4.1	0.46	5.6723	4.1	0.0822	8.0	1250	156	1115	61	1047	40	16
BC14-01 S 116	1	804	308	170	0.38	1000	2.295	8.0	0.1678	4.0	0.50	5.9584	4.0	0.0992	6.9	1609	129	1211	56	1000	37	38
BC14-01 S 118	1	217	177	60	0.82	326	2.980	10.7	0.1840	7.2	0.67	5.4335	7.2	0.1174	8.0	1917	143	1402	82	1089	72	43
BC14-01 S 124	2	120	41	25	0.34	2787	2.168	8.0	0.1807	5.8	0.72	5.5345	5.8	0.0870	5.5	1361	107	1171	56	1071	57	21
BC14-01 S 125	2	188	111	42	0.59	1536	1.988	7.0	0.1753	6.4	0.92	5.7056	6.4	0.0823	2.8	1252	55	1112	48	1041	62	17
BC14-01 S 128	2	620	525	138	0.85	737	2.192	9.7	0.1592	5.9	0.61	6.2825	5.9	0.0999	7.6	1622	142	1178	67	952	53	41
BC14-01 S 134	2	133	237	35	1.78	385	2.198	13.2	0.1873	11.0	0.83	5.3396	11.0	0.0851	7.3	1318	142	1180	92	1107	111	16
BC14-01 S 137	2	434	90	81	0.21	11681	1.829	4.3	0.1611	3.7	0.86	6.2058	3.7	0.0823	2.2	1253	44	1056	29	963	33	23
BC14-01 S 138	2	204	108	58	0.53	1324	3.019	8.7	0.2222	6.7	0.77	4.5001	6.7	0.0985	5.6	1597	105	1413	66	1294	78	19
BC14-01 S 139	2	132	61	40	0.46	619	3.562	12.4	0.2309	5.6	0.45	4.3312	5.6	0.1119	11.1	1831	201	1541	98	1339	68	27
BC14-01 S 141	2	160	63	37	0.40	2842	2.269	6.7	0.1937	5.1	0.76	5.1631	5.1	0.0850	4.4	1315	85	1203	48	1141	54	13
BC14-01 S 142	2	259	53	54	0.20	2873	1.994	6.9	0.1804	5.8	0.84	5.5435	5.8	0.0802	3.7	1202	73	1114	47	1069	58	11
BC14-01 S 145	2	289	113	58	0.39	1486	1.827	6.2	0.1658	4.8	0.77	6.0303	4.8	0.0799	3.9	1195	77	1055	40	989	44	17

BC14-01 S 147	2	617	252	131	0.41	25541	1.924	7.6	0.1754	6.1	0.80	5.7000	6.1	0.0795	4.6	1185	92	1089	51	1042	58	12
BC14-01 S 148	2	50	43	12	0.87	382	2.206	10.5	0.1894	7.2	0.69	5.2786	7.2	0.0844	7.6	1303	149	1183	73	1118	74	14
BC14-01 S 156	2	154	127	28	0.82	1959	1.624	6.7	0.1454	4.6	0.69	6.8763	4.6	0.0810	4.8	1222	95	980	42	875	38	28
BC14-01 S 158	2	86	41	20	0.47	401	2.107	9.2	0.2070	6.6	0.72	4.8313	6.6	0.0738	6.4	1037	129	1151	63	1213	73	-17
BC14-01 S 159	2	95	72	35	0.76	547	4.978	10.7	0.2896	8.5	0.80	3.4529	8.5	0.1247	6.4	2024	113	1816	90	1640	124	19
BC14-01 S 161	2	110	57	27	0.52	890	2.596	14.6	0.2099	13.7	0.94	4.7646	13.7	0.0897	5.0	1420	95	1300	107	1228	153	13
BC14-01 S 166	2	153	100	31	0.65	2252	1.845	5.6	0.1589	3.8	0.68	6.2920	3.8	0.0842	4.1	1298	80	1062	37	951	34	27
BC14-01 S 168	2	93	54	20	0.58	2376	1.891	7.6	0.1723	5.6	0.74	5.8047	5.6	0.0796	5.1	1187	100	1078	50	1025	53	14
BC14-01 S 169	2	165	59	34	0.36	1365	1.893	7.9	0.1693	4.9	0.62	5.9077	4.9	0.0811	6.2	1225	123	1079	53	1008	46	18
BC14-01 S 172	2	489	98	97	0.20	21281	1.871	6.3	0.1728	5.4	0.85	5.7879	5.4	0.0785	3.3	1160	65	1071	42	1027	51	11
BC14-01 S 175	2	323	180	64	0.56	38695	1.665	5.6	0.1575	4.5	0.80	6.3473	4.5	0.0767	3.4	1112	68	995	36	943	39	15
BC14-01 S 185	2	113	117	24	1.03	454	2.188	8.2	0.1470	5.1	0.62	6.8021	5.1	0.1080	6.4	1765	117	1177	57	884	42	50
BC14-01 S 189	2	52	43	17	0.82	7221	3.251	11.7	0.2709	10.0	0.85	3.6914	10.0	0.0870	6.2	1361	119	1469	91	1545	137	-14
BC14-01 S 190	2	162	93	38	0.57	18914	1.950	15.9	0.1931	15.4	0.97	5.1777	15.4	0.0732	4.1	1020	84	1098	107	1138	160	-12
BC14-01 S 192	2	174	72	38	0.42	601	1.996	15.0	0.1787	13.9	0.93	5.5965	13.9	0.0810	5.6	1222	109	1114	101	1060	136	13
BC14-01 S 201	2	44	36	9	0.82	573	1.783	7.6	0.1678	4.8	0.63	5.9580	4.8	0.0770	5.9	1122	117	1039	49	1000	44	11

Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{235}U$	±2s (%)	$^{206}Pb/^{238}U$	±2s (%)	error corr.	$^{238}U/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$ (Ma)	±2s (abs)	$^{207}Pb/^{235}U$ (Ma)	±2s (abs)	$^{206}Pb/^{238}U$ (Ma)	±2s (abs)	% disc.
BC14-01 S 216	2	303	136	57	0.45	3273	1.628	7.2	0.1549	5.9	0.83	6.4543	5.9	0.0762	4.0	1100	80	981	45	929	51	16
BC14-01 S 219	2	82	33	18	0.41	62837	1.940	9.2	0.1923	6.1	0.67	5.2000	6.1	0.0732	6.9	1019	139	1095	62	1134	64	-11
BC14-01 S 220	2	65	34	15	0.53	691	2.489	9.3	0.1978	5.2	0.56	5.0562	5.2	0.0913	7.8	1452	148	1269	68	1163	55	20
BC14-01 S 221	2	32	29	5	0.91	2795	1.546	10.5	0.1374	5.3	0.50	7.2803	5.3	0.0816	9.1	1237	178	949	65	830	41	33
BC14-01 S 222	2	270	173	57	0.64	3585	1.808	4.4	0.1679	4.0	0.89	5.9576	4.0	0.0781	2.0	1150	40	1048	29	1000	37	13
BC14-01 S 224	2	104	42	26	0.40	1242	2.286	13.0	0.2150	12.4	0.95	4.6517	12.4	0.0771	4.1	1124	82	1208	92	1255	141	-12
BC14-01 S 225	2	83	42	21	0.50	551	2.079	9.7	0.2133	7.4	0.76	4.6881	7.4	0.0707	6.3	948	129	1142	67	1246	84	-31
BC14-01 S 228	2	399	197	86	0.49	20402	1.993	4.7	0.1770	3.4	0.73	5.6509	3.4	0.0817	3.3	1238	64	1113	32	1050	33	15
BC14-01 S 229	2	67	39	16	0.58	8203	2.063	9.1	0.2015	6.0	0.66	4.9627	6.0	0.0743	6.9	1048	139	1137	62	1183	65	-13
BC14-01 S 230	2	165	106	36	0.64	469	2.135	8.1	0.1706	5.0	0.61	5.8609	5.0	0.0907	6.4	1441	122	1160	56	1016	47	30
BC14-01 S 231	2	363	152	79	0.42	1385	2.058	4.5	0.1767	3.4	0.76	5.6578	3.4	0.0844	2.9	1303	57	1135	30	1049	33	19
BC14-01 S 232	2	74	77	23	1.04	26322	3.308	7.4	0.2339	4.7	0.64	4.2753	4.7	0.1026	5.7	1671	106	1483	58	1355	58	19
BC14-01 S 234	2	69	24	18	0.35	897	2.625	8.3	0.2381	6.3	0.76	4.2006	6.3	0.0800	5.3	1196	105	1308	61	1377	78	-15
BC14-01 S 235	2	232	221	56	0.95	3485	1.853	5.7	0.1697	5.2	0.90	5.8937	5.2	0.0792	2.5	1178	49	1065	38	1010	48	14

Composition; Corrected isotope ratios; Apparent ages (Ma)

BC14-02
>10% discordant

BC14-02 L 237	1	95	115	39	1.22	4214	4.309	6.6	0.2954	5.2	0.79	3.3857	5.2	0.1058	4.0	1729	74	1695	54	1668	77	3
BC14-02 L 238	1	117	145	38	1.24	841	2.720	6.9	0.2318	5.8	0.83	4.3146	5.8	0.0851	3.8	1318	74	1334	51	1344	70	-2
BC14-02 L 239	1	467	79	103	0.17	7979	2.119	4.0	0.1946	3.5	0.88	5.1375	3.5	0.0789	1.9	1171	38	1155	27	1147	37	2
BC14-02 L 240	1	237	157	55	0.66	3179	1.971	6.1	0.1854	5.2	0.84	5.3951	5.2	0.0771	3.4	1124	67	1106	41	1096	52	2
BC14-02 L 241	1	166	111	39	0.67	6149	1.905	6.7	0.1863	4.8	0.72	5.3679	4.8	0.0742	4.6	1046	94	1083	44	1101	48	-5
BC14-02 L 242	1	174	113	42	0.65	707	2.011	5.7	0.1904	4.1	0.73	5.2533	4.1	0.0766	3.9	1111	78	1119	39	1123	43	-1
BC14-02 L 243	1	28	23	7	0.81	293	2.191	8.9	0.1979	4.4	0.50	5.0532	4.4	0.0803	7.7	1204	151	1178	62	1164	47	3
BC14-02 L 244	1	29	33	8	1.14	515	2.438	12.0	0.2052	5.3	0.44	4.8739	5.3	0.0862	10.7	1342	207	1254	86	1203	58	10
BC14-02 L 245	1	37	31	9	0.85	1819	2.278	6.6	0.2040	3.7	0.57	4.9019	3.7	0.0810	5.4	1221	106	1205	46	1197	41	2
BC14-02 L 246	1	145	88	45	0.61	1458	2.879	6.5	0.2390	5.7	0.88	4.1840	5.7	0.0874	3.1	1368	60	1376	49	1382	71	-1
BC14-02 L 249	1	208	93	67	0.45	2109	3.170	7.2	0.2610	5.8	0.81	3.8312	5.8	0.0881	4.2	1384	81	1450	55	1495	78	-8
BC14-02 L 253	1	86	54	21	0.63	992	2.082	8.3	0.1956	6.4	0.77	5.1127	6.4	0.0772	5.3	1126	105	1143	57	1152	68	-2
BC14-02 L 255	1	63	107	20	1.71	31833	2.349	7.5	0.2081	5.3	0.71	4.8045	5.3	0.0819	5.3	1242	103	1227	53	1219	59	2
BC14-02 L 256	1	65	105	21	1.62	592	2.357	6.2	0.2026	5.0	0.80	4.9356	5.0	0.0844	3.7	1301	72	1230	44	1189	54	9

BC14-02 L 258	1	97	117	28	1.21	385	2.369	7.7	0.2060	6.8	0.89	4.8541	6.8	0.0834	3.6	1278	69	1233	55	1208	75	6
BC14-02 L 259	1	124	85	38	0.69	1494	2.923	7.7	0.2375	6.4	0.83	4.2097	6.4	0.0892	4.3	1409	82	1388	59	1374	80	3
BC14-02 L 260	1	35	21	10	0.60	2690	3.060	10.1	0.2518	5.7	0.56	3.9710	5.7	0.0881	8.3	1385	160	1423	77	1448	74	-5
BC14-02 L 261	1	238	66	48	0.28	3948	1.747	7.8	0.1723	6.8	0.87	5.8032	6.8	0.0735	3.8	1029	76	1026	50	1025	64	0
BC14-02 L 262	1	120	105	38	0.87	1871	2.701	9.9	0.2334	9.0	0.90	4.2846	9.0	0.0839	4.3	1291	83	1329	74	1352	109	-5
BC14-02 L 263	1	73	111	24	1.51	1285	2.508	7.4	0.2204	5.7	0.76	4.5378	5.7	0.0825	4.8	1258	94	1274	54	1284	66	-2
BC14-02 L 265	1	36	34	8	0.94	209	1.751	11.4	0.1700	7.7	0.68	5.8822	7.7	0.0747	8.4	1060	170	1027	74	1012	72	5
BC14-02 L 268	1	183	72	53	0.39	1325	2.801	6.4	0.2368	5.8	0.91	4.2236	5.8	0.0858	2.6	1334	51	1356	48	1370	71	-3
BC14-02 L 269	1	53	48	15	0.91	306	2.453	6.7	0.2125	4.5	0.67	4.7065	4.5	0.0837	5.0	1286	97	1258	49	1242	51	3
BC14-02 L 270	1	51	48	14	0.93	206	2.228	8.9	0.2051	5.0	0.56	4.8745	5.0	0.0788	7.4	1166	146	1190	62	1203	55	-3
BC14-02 L 271	1	109	125	51	1.14	784	4.985	5.8	0.3096	5.0	0.86	3.2298	5.0	0.1168	3.0	1907	54	1817	49	1739	76	9
BC14-02 L 272	1	142	52	30	0.37	1534	1.922	6.2	0.1798	4.9	0.79	5.5609	4.9	0.0775	3.8	1135	76	1089	41	1066	48	6
BC14-02 L 273	1	80	66	23	0.82	405	2.664	5.7	0.2276	4.5	0.79	4.3945	4.5	0.0849	3.5	1314	69	1319	42	1322	54	-1
BC14-02 L 274	1	69	55	20	0.80	685	2.705	8.3	0.2256	5.3	0.64	4.4336	5.3	0.0870	6.4	1360	123	1330	62	1311	63	4
BC14-02 L 276	1	66	33	17	0.50	464	2.486	6.9	0.2205	5.3	0.77	4.5357	5.3	0.0818	4.4	1241	86	1268	50	1284	62	-4
BC14-02 L 277	1	41	62	9	1.49	413	1.495	8.2	0.1534	5.1	0.62	6.5203	5.1	0.0707	6.4	948	132	928	50	920	44	3

BC14-02 L 278	1	51	77	11	1.52	1282	1.588	8.8	0.1567	6.6	0.75	6.3823	6.6	0.0735	5.9	1028	118	965	55	938	57	9
BC14-02 L 279	1	74	73	20	0.99	3199	2.269	8.7	0.2030	7.1	0.82	4.9263	7.1	0.0811	4.9	1223	97	1203	61	1191	77	3
BC14-02 L 280	1	192	114	43	0.59	1190	1.914	4.5	0.1806	3.3	0.73	5.5385	3.3	0.0769	3.1	1118	61	1086	30	1070	32	4
BC14-02 L 281	1	209	125	48	0.60	1393	1.936	4.3	0.1822	3.8	0.87	5.4892	3.8	0.0771	2.2	1123	43	1094	29	1079	37	4
BC14-02 L 282	1	142	94	35	0.66	41398	2.215	4.6	0.1970	3.4	0.75	5.0757	3.4	0.0815	3.0	1234	59	1186	32	1159	36	6
BC14-02 L 283	1	151	69	31	0.46	631	1.763	4.6	0.1697	3.3	0.72	5.8917	3.3	0.0753	3.2	1077	65	1032	30	1011	31	6
BC14-02 L 284	1	112	46	27	0.41	1660	2.264	7.3	0.2010	5.1	0.70	4.9758	5.1	0.0817	5.2	1239	101	1201	51	1181	55	5
BC14-02 L 285	1	124	104	33	0.84	2126	2.138	6.6	0.2033	5.7	0.87	4.9190	5.7	0.0763	3.2	1103	65	1161	45	1193	62	-8
BC14-02 L 286	1	91	60	25	0.66	600	2.506	7.7	0.2230	5.7	0.74	4.4839	5.7	0.0815	5.1	1234	101	1274	56	1298	67	-5
BC14-02 L 289	1	89	53	25	0.59	524	2.689	7.2	0.2251	5.9	0.81	4.4428	5.9	0.0866	4.2	1352	81	1325	53	1309	69	3
BC14-02 L 290	1	115	340	76	2.96	1448	5.129	9.0	0.3206	8.2	0.91	3.1187	8.2	0.1160	3.6	1896	65	1841	76	1793	128	5
BC14-02 L 291	1	111	67	29	0.61	1060	2.300	8.0	0.2084	6.8	0.85	4.7987	6.8	0.0800	4.1	1198	82	1212	57	1220	76	-2
BC14-02 L 292	1	39	26	13	0.66	808	3.354	10.4	0.2618	5.7	0.54	3.8194	5.7	0.0929	8.8	1486	166	1494	82	1499	76	-1
BC14-02 L 293	1	69	43	18	0.63	691	2.436	7.2	0.2211	4.3	0.60	4.5237	4.3	0.0799	5.8	1195	114	1253	52	1287	51	-8
BC14-02 L 296	1	56	48	14	0.86	2655	2.014	9.9	0.1925	5.5	0.56	5.1952	5.5	0.0759	8.2	1092	165	1120	67	1135	58	-4
BC14-02 L 297	1	53	51	14	0.97	8803	2.175	9.0	0.1940	5.4	0.61	5.1553	5.4	0.0813	7.1	1229	140	1173	62	1143	57	7

BC14-02 L 300	1	117	117	48	1.00	1595	4.172	7.1	0.2872	6.3	0.90	3.4821	6.3	0.1054	3.1	1721	57	1669	58	1627	91	5
BC14-02 S 303	1	279	335	86	1.20	11018	2.417	4.7	0.2068	4.2	0.89	4.8361	4.2	0.0848	2.2	1310	42	1248	34	1212	46	8
BC14-02 S 304	1	74	62	24	0.83	1453	3.214	6.4	0.2509	5.2	0.80	3.9849	5.2	0.0929	3.8	1485	73	1460	50	1443	67	3
BC14-02 S 305	1	396	47	80	0.12	2677	1.918	5.6	0.1804	4.7	0.82	5.5422	4.7	0.0771	3.2	1123	64	1087	38	1069	46	5
BC14-02 S 306	1	144	79	39	0.55	769	2.481	5.1	0.2159	4.3	0.85	4.6325	4.3	0.0834	2.7	1278	53	1267	37	1260	50	1
BC14-02 S 307	1	353	119	76	0.34	9796	1.921	5.4	0.1792	4.8	0.89	5.5810	4.8	0.0778	2.5	1141	50	1089	36	1062	47	7
BC14-02 S 309	1	97	129	35	1.34	643	3.105	8.6	0.2451	6.7	0.78	4.0794	6.7	0.0919	5.4	1465	103	1434	66	1413	85	4
BC14-02 S 311	1	52	53	10	1.01	197	1.455	8.9	0.1529	5.6	0.63	6.5414	5.6	0.0690	6.9	900	143	912	54	917	48	-2
BC14-02 S 312	1	52	30	11	0.58	1376	1.923	6.9	0.1841	4.8	0.70	5.4320	4.8	0.0758	5.0	1089	100	1089	46	1089	48	0
BC14-02 S 313	1	111	84	30	0.76	7960	2.361	8.3	0.2066	6.3	0.76	4.8399	6.3	0.0829	5.4	1267	105	1231	59	1211	70	4
BC14-02 S 315	1	153	54	31	0.35	1278	1.865	5.9	0.1759	4.6	0.77	5.6866	4.6	0.0769	3.8	1119	75	1069	39	1044	44	7
BC14-02 S 318	1	131	39	51	0.29	2255	5.086	5.0	0.3210	4.2	0.85	3.1150	4.2	0.1149	2.7	1878	48	1834	42	1795	66	4
BC14-02 S 319	1	192	169	73	0.88	4527	3.875	7.6	0.2877	7.3	0.95	3.4753	7.3	0.0977	2.4	1580	45	1609	62	1630	104	-3
BC14-02 S 320	1	223	148	68	0.66	3964	3.045	4.8	0.2347	4.4	0.93	4.2608	4.4	0.0941	1.8	1510	34	1419	37	1359	54	10
BC14-02 S 321	1	250	91	55	0.36	5427	1.965	5.5	0.1848	4.8	0.88	5.4106	4.8	0.0771	2.6	1124	53	1104	37	1093	49	3
BC14-02 S 323	1	130	29	32	0.22	404	2.435	6.9	0.2196	6.3	0.91	4.5531	6.3	0.0804	2.9	1207	56	1253	50	1280	73	-6

BC14-02 S 325	1	47	25	11	0.54	5900	2.315	13.8	0.2001	12.2	0.89	4.9975	12.2	0.0839	6.4	1291	124	1217	98	1176	132	9
BC14-02 S 327	1	69	53	23	0.77	2492	3.328	7.3	0.2668	5.9	0.80	3.7488	5.9	0.0905	4.4	1436	85	1488	57	1524	79	-6
BC14-02 S 328	1	84	68	41	0.81	3072	5.818	5.8	0.3636	4.0	0.69	2.7505	4.0	0.1161	4.2	1897	76	1949	50	1999	69	-5
BC14-02 S 329	1	136	140	61	1.03	1703	4.748	14.7	0.3088	14.5	0.99	3.2378	14.5	0.1115	2.4	1824	44	1776	123	1735	220	5
BC14-02 S 330	1	395	41	85	0.10	58768	2.013	4.4	0.1946	3.1	0.70	5.1394	3.1	0.0750	3.2	1070	63	1120	30	1146	32	-7
BC14-02 S 331	1	62	48	40	0.78	5654	11.340	7.1	0.4732	6.5	0.92	2.1134	6.5	0.1738	2.8	2595	46	2551	66	2497	135	4
BC14-02 S 335	1	211	83	65	0.39	6091	3.330	5.3	0.2551	4.7	0.89	3.9202	4.7	0.0947	2.4	1522	45	1488	41	1465	62	4
BC14-02 S 336	1	139	182	66	1.32	17975	5.080	4.7	0.3182	4.3	0.92	3.1431	4.3	0.1158	1.9	1892	34	1833	40	1781	68	6
BC14-02 S 338	1	113	99	38	0.88	3347	3.170	5.6	0.2497	5.0	0.90	4.0051	5.0	0.0921	2.5	1469	47	1450	43	1437	64	2
BC14-02 S 339	1	77	70	18	0.91	373	1.970	5.8	0.1847	4.1	0.71	5.4142	4.1	0.0774	4.1	1131	82	1105	39	1093	42	3
BC14-02 S 340	1	166	86	51	0.52	2517	3.116	4.9	0.2415	3.9	0.80	4.1412	3.9	0.0936	3.0	1500	56	1437	38	1394	49	7
BC14-02 S 344	1	230	289	108	1.25	5960	4.844	4.0	0.3075	3.3	0.83	3.2515	3.3	0.1142	2.2	1868	41	1793	34	1729	50	7
BC14-02 S 345	1	389	131	80	0.34	7940	1.819	5.6	0.1724	5.1	0.92	5.7993	5.1	0.0765	2.2	1109	44	1052	37	1026	49	8
BC14-02 S 347	1	30	25	7	0.85	502	1.989	8.2	0.1869	4.7	0.58	5.3515	4.7	0.0772	6.7	1126	134	1112	55	1104	48	2
BC14-02 S 349	1	150	110	37	0.73	636	1.990	6.5	0.1879	4.9	0.75	5.3223	4.9	0.0768	4.3	1117	85	1112	44	1110	50	1
BC14-02 S 351	1	78	62	19	0.80	3651	2.193	6.6	0.1973	5.4	0.81	5.0678	5.4	0.0806	3.8	1212	76	1179	46	1161	57	4

BC14-02 S 354	1	104	62	29	0.59	980	2.671	6.4	0.2234	5.1	0.79	4.4760	5.1	0.0867	3.9	1354	75	1321	47	1300	60	4
BC14-02 S 356	2	115	151	48	1.31	56734	3.906	5.7	0.2734	5.3	0.93	3.6571	5.3	0.1036	2.1	1690	39	1615	46	1558	73	8
BC14-02 S 357	2	85	35	25	0.41	1713	3.139	4.6	0.2425	3.9	0.83	4.1239	3.9	0.0939	2.5	1506	48	1442	36	1400	48	7
BC14-02 S 358	2	42	61	15	1.45	222	2.923	9.6	0.2461	6.7	0.70	4.0632	6.7	0.0861	6.9	1341	133	1388	73	1418	85	-6
BC14-02 S 361	2	30	30	9	0.99	29130	2.782	6.7	0.2378	4.1	0.62	4.2059	4.1	0.0849	5.2	1313	102	1351	50	1375	51	-5
BC14-02 S 363	2	77	53	25	0.68	531	3.191	6.9	0.2563	6.3	0.91	3.9021	6.3	0.0903	2.8	1432	54	1455	53	1471	82	-3
BC14-02 S 367	2	83	62	21	0.75	933	2.116	13.5	0.1987	10.0	0.74	5.0331	10.0	0.0772	9.2	1127	182	1154	93	1168	106	-4
BC14-02 S 369	2	214	177	87	0.83	6604	4.319	12.5	0.2996	12.0	0.96	3.3380	12.0	0.1046	3.7	1707	67	1697	103	1689	178	1
BC14-02 S 371	2	125	70	51	0.56	11014	4.800	5.7	0.3211	5.1	0.89	3.1138	5.1	0.1084	2.6	1773	47	1785	48	1795	80	-1
BC14-02 S 373	2	38	42	14	1.11	1081	3.771	31.3	0.2688	29.1	0.93	3.7201	29.1	0.1017	11.8	1656	218	1587	252	1535	397	7
BC14-02 S 376	2	122	50	15	0.41	1202	0.930	7.2	0.1099	5.7	0.79	9.1017	5.7	0.0614	4.4	653	95	668	35	672	36	-3
BC14-02 S 380	2	70	51	29	0.72	2051	4.928	5.4	0.3099	4.3	0.80	3.2267	4.3	0.1153	3.3	1885	59	1807	46	1740	66	8
BC14-02 S 385	2	103	53	26	0.52	102108	2.344	6.6	0.2019	5.3	0.80	4.9536	5.3	0.0842	4.0	1298	77	1226	47	1185	58	9
BC14-02 S 388	2	76	78	26	1.02	865	2.962	7.6	0.2422	7.1	0.93	4.1289	7.1	0.0887	2.8	1398	53	1398	58	1398	89	0
BC14-02 S 391	2	324	162	73	0.50	6786	1.906	4.7	0.1814	3.9	0.83	5.5122	3.9	0.0762	2.6	1101	52	1083	31	1075	38	2
BC14-02 S 392	2	123	62	32	0.51	1457	2.505	9.8	0.2091	8.7	0.89	4.7833	8.7	0.0869	4.4	1359	86	1274	71	1224	97	10

BC14-02 S 395	2	125	95	47	0.76	1691	3.937	5.7	0.2785	5.3	0.93	3.5905	5.3	0.1025	2.1	1670	40	1621	46	1584	74	5
BC14-02 S 396	2	115	80	37	0.70	2478	3.209	6.3	0.2450	5.7	0.91	4.0821	5.7	0.0950	2.6	1528	49	1459	49	1412	72	8
BC14-02 S 397	2	56	43	15	0.76	2941	2.477	6.2	0.2103	4.4	0.71	4.7562	4.4	0.0854	4.3	1326	84	1265	45	1230	49	7
BC14-02 S 400	2	30	47	12	1.58	452	3.405	7.2	0.2643	5.9	0.81	3.7833	5.9	0.0934	4.2	1497	79	1506	57	1512	79	-1
BC14-02 S 401	2	201	202	66	1.01	1944	2.926	5.4	0.2293	4.3	0.80	4.3608	4.3	0.0926	3.3	1479	62	1389	41	1331	52	10
BC14-02 S 402	2	60	32	21	0.53	371	3.696	6.1	0.2759	5.1	0.83	3.6248	5.1	0.0972	3.4	1571	63	1571	49	1571	71	0
BC14-02 S 403	2	157	225	83	1.43	18704	5.426	6.3	0.3446	5.6	0.88	2.9017	5.6	0.1142	3.0	1867	53	1889	54	1909	93	-2
BC14-02 S 407	2	125	66	60	0.53	3956	6.757	6.5	0.3749	5.8	0.89	2.6672	5.8	0.1307	3.0	2107	53	2080	58	2053	102	3
BC14-02 S 408	2	140	147	40	1.05	3346	2.362	5.9	0.2056	5.1	0.88	4.8645	5.1	0.0833	2.8	1277	55	1231	42	1205	56	6

>10% discordant

BC14-02 L 248	1	26	21	7	0.79	881	2.355	9.2	0.2213	6.8	0.74	4.5181	6.8	0.0772	6.2	1126	123	1229	65	1289	79	-14
BC14-02 L 250	1	23	45	9	1.97	509	2.739	9.7	0.2419	5.7	0.59	4.1336	5.7	0.0821	7.8	1248	153	1339	72	1397	72	-12
BC14-02 L 251	1	20	36	7	1.82	450	2.784	10.6	0.2468	7.9	0.75	4.0514	7.9	0.0818	7.1	1241	138	1351	79	1422	101	-15
BC14-02 L 252	1	64	27	14	0.42	751	1.981	8.4	0.1954	6.6	0.79	5.1176	6.6	0.0735	5.2	1029	105	1109	57	1151	70	-12
BC14-02 L 254	1	102	112	34	1.10	463	2.692	7.7	0.2433	6.8	0.88	4.1099	6.8	0.0802	3.7	1203	73	1326	57	1404	85	-17
BC14-02 L 257	1	149	209	50	1.40	2587	2.456	8.6	0.2248	7.6	0.89	4.4476	7.6	0.0792	4.0	1177	79	1259	62	1307	90	-11

BC14-02 L 264	1	84	87	23	1.03	2067	2.281	7.6	0.1950	5.5	0.73	5.1284	5.5	0.0849	5.2	1312	101	1207	53	1148	58	12
BC14-02 L 266	1	119	66	49	0.56	860	5.410	4.8	0.3167	4.3	0.89	3.1578	4.3	0.1239	2.2	2013	39	1887	41	1773	66	12
BC14-02 L 267	1	153	98	66	0.64	3148	5.539	5.9	0.3222	5.2	0.89	3.1041	5.2	0.1247	2.7	2025	48	1907	50	1800	82	11
BC14-02 L 275	1	63	40	16	0.64	767	2.336	7.3	0.2183	5.2	0.72	4.5815	5.2	0.0776	5.1	1137	101	1223	52	1273	60	-12
BC14-02 L 287	1	56	30	14	0.53	478	2.391	8.5	0.2245	5.4	0.64	4.4536	5.4	0.0772	6.5	1128	130	1240	61	1306	64	-16
BC14-02 L 288	1	155	57	36	0.37	1111	2.294	7.6	0.1935	6.6	0.87	5.1674	6.6	0.0860	3.8	1337	73	1210	54	1140	69	15
BC14-02 L 294	1	371	175	91	0.47	6313	2.279	4.0	0.1965	3.2	0.80	5.0902	3.2	0.0841	2.4	1295	47	1206	29	1156	34	11
BC14-02 L 295	1	18	16	4	0.87	548	1.977	13.3	0.1983	7.6	0.57	5.0426	7.6	0.0723	10.9	995	222	1108	90	1166	81	-17
BC14-02 L 299	1	27	39	6	1.43	1335	1.630	9.6	0.1558	5.1	0.54	6.4187	5.1	0.0759	8.1	1091	161	982	60	933	45	14
BC14-02 L 301	1	111	185	19	1.67	25467	0.935	8.6	0.0992	6.1	0.71	10.0761	6.1	0.0683	6.0	879	125	670	42	610	35	31
BC14-02 L 302	1	303	103	103	0.34	13298	4.361	6.0	0.2819	5.7	0.96	3.5472	5.7	0.1122	1.7	1835	31	1705	49	1601	81	13
BC14-02 S 308	1	438	151	85	0.35	6201	1.704	5.4	0.1629	4.7	0.87	6.1395	4.7	0.0759	2.7	1092	54	1010	35	973	43	11
BC14-02 S 314	1	281	304	43	1.08	14718	0.982	6.1	0.1094	4.2	0.70	9.1435	4.2	0.0651	4.4	778	92	695	31	669	27	14
BC14-02 S 316	1	76	131	34	1.73	7928	3.814	5.8	0.2618	3.6	0.63	3.8197	3.6	0.1057	4.5	1726	82	1596	46	1499	48	13
BC14-02 S 322	1	198	27	42	0.14	6242	2.106	6.3	0.1862	5.7	0.90	5.3706	5.7	0.0820	2.7	1246	53	1151	44	1101	58	12
BC14-02 S 324	1	75	53	10	0.71	283	1.058	8.7	0.1156	4.7	0.54	8.6515	4.7	0.0664	7.3	818	152	733	45	705	31	14

BC14-02 S 334	1	148	134	40	0.90	30125	2.328	6.8	0.1966	5.8	0.85	5.0877	5.8	0.0859	3.6	1336	69	1221	48	1157	61	13
BC14-02 S 341	1	171	63	56	0.37	5732	3.981	5.0	0.2684	4.2	0.83	3.7255	4.2	0.1076	2.8	1758	51	1630	41	1533	57	13
BC14-02 S 342	1	184	292	85	1.59	1718	4.322	4.4	0.2825	3.8	0.86	3.5402	3.8	0.1110	2.2	1816	41	1698	37	1604	55	12
BC14-02 S 346	1	98	29	58	0.30	5215	12.436	8.0	0.4554	7.6	0.94	2.1957	7.6	0.1980	2.7	2810	44	2638	75	2419	153	14
BC14-02 S 350	1	544	475	114	0.87	28515	1.601	5.2	0.1521	4.0	0.78	6.5731	4.0	0.0763	3.3	1104	65	971	32	913	34	17
BC14-02 S 355	2	233	112	58	0.48	1769	2.326	10.2	0.1989	9.9	0.98	5.0272	9.9	0.0848	2.2	1312	43	1220	72	1170	106	11
BC14-02 S 362	2	94	125	42	1.33	4594	4.762	4.6	0.2982	3.6	0.77	3.3538	3.6	0.1158	2.9	1893	53	1778	39	1682	53	11
BC14-02 S 368	2	130	73	33	0.56	1097	2.103	10.3	0.2076	8.9	0.86	4.8168	8.9	0.0735	5.3	1027	107	1150	71	1216	99	-18
BC14-02 S 377	2	281	155	73	0.55	2501	2.519	3.9	0.2054	3.5	0.90	4.8682	3.5	0.0889	1.7	1403	33	1278	28	1204	38	14
BC14-02 S 378	2	139	84	33	0.61	1554	2.072	5.7	0.1852	5.0	0.87	5.3992	5.0	0.0811	2.8	1225	55	1140	39	1095	50	11
BC14-02 S 379	2	145	91	41	0.63	3001	2.699	5.0	0.2178	4.4	0.88	4.5923	4.4	0.0899	2.4	1423	46	1328	37	1270	51	11
BC14-02 S 382	2	223	191	96	0.86	2951	5.195	4.9	0.3095	4.6	0.95	3.2312	4.6	0.1217	1.6	1982	28	1852	42	1738	71	12
BC14-02 S 383	2	74	124	25	1.69	1262	2.333	6.2	0.1988	5.0	0.80	5.0295	5.0	0.0851	3.7	1318	72	1222	44	1169	53	11
BC14-02 S 399	2	104	73	27	0.70	1394	2.376	7.1	0.1978	5.8	0.81	5.0567	5.8	0.0871	4.2	1364	81	1235	51	1163	61	15
BC14-02 S 405	2	172	161	64	0.94	21560	3.964	6.1	0.2638	3.8	0.61	3.7906	3.8	0.1090	4.8	1782	88	1627	50	1509	51	15
BC14-02 S 412	2	147	104	20	0.71	4345	0.993	8.3	0.1072	5.5	0.66	9.3259	5.5	0.0671	6.2	842	128	700	42	657	34	22

BC14-02 S 413	2	223	159	55	0.71	1670	2.401	10.2	0.1747	9.3	0.91	5.7241	9.3	0.0997	4.1	1618	77	1243	73	1038	89	36

		Composition							**Corrected isotope ratios**							**Apparent ages (Ma)**						
Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{235}U$	±2s (%)	$^{206}Pb/^{238}U$	±2s (%)	error corr.	$^{238}U/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (abs)	$^{207}Pb/^{235}U$	±2s (abs)	$^{206}Pb/^{238}U$	±2s (abs)	% disc.
BC14-03																						
<10% discordant																						
BC14-03 L 415	1	139	92	38	0.66	1989	2.308	6.8	0.2137	6.3	0.93	4.6788	6.3	0.0783	2.4	1155	48	1215	48	1249	72	-8
BC14-03 L 416	1	83	90	26	1.09	1270	2.685	7.8	0.2312	6.9	0.88	4.3252	6.9	0.0842	3.7	1298	71	1324	58	1341	84	-3
BC14-03 L 418	1	63	39	17	0.61	482	2.658	7.3	0.2253	4.8	0.66	4.4378	4.8	0.0856	5.5	1328	106	1317	54	1310	57	1
BC14-03 L 419	1	103	60	30	0.58	24336	2.766	7.1	0.2311	5.9	0.83	4.3269	5.9	0.0868	4.0	1356	77	1347	53	1340	71	1
BC14-03 L 420	1	75	23	18	0.31	797	2.449	5.7	0.2071	4.0	0.69	4.8288	4.0	0.0858	4.2	1333	80	1257	41	1213	44	9
BC14-03 L 421	1	34	9	9	0.27	373	2.756	7.1	0.2356	4.1	0.58	4.2436	4.1	0.0848	5.8	1312	113	1344	53	1364	51	-4
BC14-03 L 423	1	139	130	34	0.94	6677	1.905	5.5	0.1824	4.8	0.87	5.4817	4.8	0.0757	2.7	1088	55	1083	37	1080	47	1
BC14-03 L 424	1	329	92	67	0.28	5712	1.897	6.0	0.1762	5.3	0.88	5.6756	5.3	0.0781	2.9	1149	57	1080	40	1046	51	9
BC14-03 L 426	1	99	25	22	0.25	4505	2.105	6.8	0.1956	5.6	0.82	5.1133	5.6	0.0781	3.9	1148	77	1150	47	1151	59	0
BC14-03 L 427	1	240	135	54	0.56	3001	1.847	5.2	0.1798	4.4	0.84	5.5623	4.4	0.0745	2.8	1055	57	1062	35	1066	43	-1
BC14-03 L 428	1	56	61	17	1.10	436	2.624	6.3	0.2202	5.2	0.83	4.5417	5.2	0.0864	3.6	1348	69	1307	46	1283	61	5

BC14-03 L 429	1	113	45	28	0.40	6950	2.284	5.0	0.2033	4.0	0.80	4.9177	4.0	0.0815	3.0	1233	59	1207	36	1193 44	3
BC14-03 L 430	1	129	51	30	0.39	697	2.212	6.0	0.1977	4.6	0.77	5.0588	4.6	0.0812	3.8	1226	75	1185	42	1163 49	5
BC14-03 L 431	1	41	37	11	0.89	192	2.412	7.1	0.2044	4.9	0.69	4.8935	4.9	0.0856	5.1	1329	99	1246	51	1199 54	10
BC14-03 L 432	1	76	87	22	1.15	1954	2.259	6.3	0.2069	5.1	0.80	4.8321	5.1	0.0792	3.8	1176	76	1200	45	1213 56	-3
BC14-03 L 433	1	86	33	19	0.39	391	2.105	8.2	0.1923	6.0	0.73	5.2001	6.0	0.0794	5.6	1182	111	1150	57	1134 62	4
BC14-03 L 434	1	79	45	52	0.58	2107	11.704	10.7	0.4801	10.2	0.95	2.0830	10.2	0.1768	3.2	2623	53	2581	100	2528 214	4
BC14-03 L 435	1	59	31	42	0.53	1354	13.221	7.1	0.5268	5.9	0.83	1.8984	5.9	0.1820	3.9	2672	65	2696	67	2728 131	-2
BC14-03 L 436	1	29	70	11	2.42	1515	2.233	9.2	0.2053	6.9	0.76	4.8704	6.9	0.0789	6.0	1169	119	1192	64	1204 76	-3
BC14-03 L 437	1	61	36	22	0.59	508	3.692	9.5	0.2873	7.9	0.83	3.4809	7.9	0.0932	5.2	1492	99	1570	76	1628 113	-9
BC14-03 L 441	1	130	43	30	0.33	2342	2.039	6.8	0.1983	6.0	0.89	5.0432	6.0	0.0746	3.1	1057	63	1129	46	1166 64	-10
BC14-03 L 442	1	184	61	44	0.33	2033	2.129	8.4	0.2034	7.5	0.89	4.9157	7.5	0.0759	3.8	1092	76	1158	58	1194 81	-9
BC14-03 L 443	1	85	42	20	0.50	308	1.966	8.1	0.1931	7.1	0.88	5.1776	7.1	0.0738	3.8	1036	76	1104	54	1138 74	-10
BC14-03 L 444	1	201	153	53	0.76	1068	2.057	13.5	0.1988	12.6	0.93	5.0305	12.6	0.0750	5.0	1070	100	1135	93	1169 135	-9
BC14-03 L 445	1	214	245	105	1.14	5988	5.116	9.8	0.3398	8.8	0.90	2.9432	8.8	0.1092	4.2	1786	77	1839	83	1886 144	-6
BC14-03 L 447	1	54	20	14	0.37	193	2.706	8.6	0.2326	7.0	0.82	4.2988	7.0	0.0844	5.0	1301	97	1330	64	1348 86	-4
BC14-03 L 450	1	101	44	22	0.44	1407	1.869	7.8	0.1788	6.4	0.83	5.5931	6.4	0.0758	4.4	1090	88	1070	52	1060 63	3

BC14-03 L 451	1	185	63	39	0.34	5175	1.845	6.9	0.1736	5.8	0.84	5.7590	5.8	0.0771	3.7	1123	74	1062	45	1032	55	8
BC14-03 L 453	1	229	87	49	0.38	1003	1.875	6.1	0.1779	4.8	0.79	5.6214	4.8	0.0765	3.8	1107	75	1072	40	1055	47	5
BC14-03 L 454	1	327	87	68	0.27	2957	1.864	7.2	0.1777	6.2	0.85	5.6261	6.2	0.0761	3.8	1097	76	1068	48	1055	60	4
BC14-03 L 455	1	264	105	51	0.40	2320	1.597	4.3	0.1626	3.7	0.86	6.1518	3.7	0.0713	2.2	965	45	969	27	971	34	-1
BC14-03 L 456	1	182	70	36	0.39	827	1.665	4.5	0.1661	3.8	0.84	6.0222	3.8	0.0727	2.5	1006	50	995	29	990	35	2
BC14-03 L 457	1	178	215	87	1.21	2718	5.248	4.1	0.3320	3.7	0.91	3.0119	3.7	0.1146	1.7	1874	31	1860	35	1848	60	1
BC14-03 L 458	1	127	119	61	0.93	1260	5.501	4.4	0.3486	3.9	0.88	2.8686	3.9	0.1145	2.1	1871	38	1901	38	1928	64	-3
BC14-03 L 459	1	146	98	47	0.67	1197	3.184	4.7	0.2479	3.7	0.80	4.0343	3.7	0.0932	2.8	1491	53	1453	36	1428	48	4
BC14-03 L 460	1	103	85	35	0.82	6898	3.096	5.8	0.2505	4.7	0.81	3.9926	4.7	0.0896	3.4	1418	65	1432	45	1441	61	-2
BC14-03 L 461	1	285	153	80	0.54	12757	2.730	5.3	0.2237	4.8	0.90	4.4702	4.8	0.0885	2.3	1394	44	1337	40	1301	57	7
BC14-03 L 462	1	86	61	27	0.71	421	2.980	5.9	0.2437	5.0	0.84	4.1038	5.0	0.0887	3.2	1398	62	1403	45	1406	63	-1
BC14-03 L 463	1	29	26	10	0.91	1033	3.444	9.2	0.2658	7.0	0.76	3.7620	7.0	0.0940	6.0	1508	114	1515	73	1520	94	-1
BC14-03 L 464	1	92	31	23	0.34	1620	2.383	7.5	0.2146	6.3	0.84	4.6596	6.3	0.0805	4.0	1210	79	1238	53	1253	72	-4
BC14-03 L 465	1	119	51	30	0.43	3208	2.310	7.0	0.2064	6.1	0.87	4.8449	6.1	0.0812	3.4	1226	67	1215	50	1210	68	1
BC14-03 L 466	1	81	221	24	2.73	3828	1.511	6.3	0.1512	5.1	0.81	6.6155	5.1	0.0725	3.7	1001	75	935	39	907	44	9
BC14-03 L 469	1	100	44	27	0.43	17310	2.659	6.6	0.2203	5.4	0.82	4.5399	5.4	0.0875	3.8	1373	73	1317	49	1283	63	7

BC14-03 L 471	1	47	33	12	0.71	712	2.133	8.1	0.1977	5.5	0.68	5.0585	5.5	0.0783	5.9	1154	117	1160	56	1163	59	-1
BC14-03 L 474	2	125	40	29	0.32	1024	2.124	8.3	0.1966	7.1	0.86	5.0857	7.1	0.0783	4.3	1155	85	1157	57	1157	75	0
BC14-03 L 475	2	92	26	27	0.29	5075	3.093	8.3	0.2539	6.7	0.81	3.9385	6.7	0.0883	4.9	1390	94	1431	64	1459	88	-5
BC14-03 L 476	2	143	73	38	0.51	1208	2.300	7.9	0.2096	6.6	0.83	4.7719	6.6	0.0796	4.3	1187	86	1212	56	1226	73	-3
BC14-03 L 479	2	115	53	32	0.46	1128	2.611	9.2	0.2232	8.4	0.92	4.4803	8.4	0.0849	3.7	1312	72	1304	68	1299	99	1
BC14-03 L 480	2	103	64	30	0.62	1620	2.661	11.1	0.2296	10.0	0.90	4.3546	10.0	0.0841	4.8	1294	93	1318	82	1333	120	-3
BC14-03 L 481	2	80	87	18	1.09	358	1.582	8.6	0.1651	7.5	0.86	6.0562	7.5	0.0695	4.4	914	90	963	54	985	68	-8
BC14-03 L 482	2	97	60	24	0.62	785	2.211	7.9	0.2041	6.4	0.80	4.9001	6.4	0.0786	4.7	1162	94	1185	56	1197	70	-3
BC14-03 L 483	2	73	33	17	0.46	877	2.215	7.6	0.1982	5.9	0.78	5.0454	5.9	0.0811	4.8	1223	93	1186	53	1166	63	5
BC14-03 L 489	2	243	127	52	0.53	2473	1.767	5.5	0.1703	4.8	0.88	5.8719	4.8	0.0753	2.6	1075	52	1033	35	1014	45	6
BC14-03 L 490	2	146	130	47	0.89	6071	2.750	6.3	0.2268	5.3	0.84	4.4088	5.3	0.0879	3.3	1381	64	1342	47	1318	63	5
BC14-03 L 491	2	128	98	25	0.77	1662	1.475	7.1	0.1485	5.5	0.77	6.7349	5.5	0.0720	4.6	987	93	920	43	892	46	10
BC14-03 L 493	2	22	24	9	1.08	699	4.405	7.7	0.3098	4.9	0.64	3.2278	4.9	0.1031	6.0	1681	110	1713	64	1740	75	-3
BC14-03 L 495	2	183	65	40	0.36	957	1.857	6.3	0.1835	5.0	0.79	5.4499	5.0	0.0734	3.8	1026	77	1066	42	1086	50	-6
BC14-03 L 496	2	178	234	77	1.32	3494	3.994	7.3	0.2784	6.2	0.85	3.5922	6.2	0.1041	3.8	1698	71	1633	59	1583	87	7
BC14-03 L 497	2	44	18	11	0.40	685	2.614	8.1	0.2263	6.2	0.77	4.4195	6.2	0.0838	5.1	1288	100	1305	59	1315	74	-2

BC14-03 S 503	2	166	38	33	0.23	6089	1.818	4.3	0.1710	3.3	0.77	5.8482	3.3	0.0771	2.8	1125	55	1052	28	1018	31	10
BC14-03 S 504	2	90	59	26	0.66	6123	2.590	7.5	0.2222	5.4	0.73	4.4999	5.4	0.0845	5.1	1305	99	1298	55	1294	64	1
BC14-03 S 505	2	140	106	52	0.75	5321	3.845	4.2	0.2697	3.9	0.91	3.7073	3.9	0.1034	1.8	1686	33	1602	34	1539	53	9
BC14-03 S 506	2	203	85	48	0.42	11214	2.140	4.3	0.1916	3.3	0.77	5.2190	3.3	0.0810	2.8	1221	54	1162	30	1130	34	7
BC14-03 S 507	2	111	45	23	0.41	1575	1.772	6.7	0.1761	3.8	0.57	5.6795	3.8	0.0730	5.5	1014	112	1035	43	1045	37	-3
BC14-03 S 508	2	33	18	9	0.54	2039	2.572	8.2	0.2261	4.8	0.58	4.4237	4.8	0.0825	6.7	1258	132	1293	60	1314	57	-4
BC14-03 S 509	2	63	100	21	1.58	461	2.382	8.0	0.2163	6.2	0.78	4.6228	6.2	0.0799	5.0	1194	99	1237	57	1262	71	-6
BC14-03 S 510	2	95	62	21	0.65	1203	1.870	6.1	0.1796	4.5	0.74	5.5665	4.5	0.0755	4.2	1081	83	1070	41	1065	44	1
BC14-03 S 512	2	56	25	34	0.44	2121	11.045	4.6	0.4569	3.8	0.84	2.1887	3.8	0.1753	2.5	2609	41	2527	42	2426	78	7
BC14-03 S 513	2	185	161	45	0.87	3514	1.889	5.3	0.1786	3.9	0.75	5.5998	3.9	0.0767	3.5	1114	70	1077	35	1059	39	5
BC14-03 S 515	2	218	37	57	0.17	2206	2.757	7.4	0.2219	6.1	0.82	4.5074	6.1	0.0901	4.2	1428	80	1344	55	1292	71	10
BC14-03 S 517	2	63	30	14	0.48	4980	2.103	8.3	0.1967	5.6	0.67	5.0829	5.6	0.0775	6.2	1135	123	1150	57	1158	59	-2
BC14-03 S 518	2	131	74	28	0.56	952	1.910	5.2	0.1765	4.3	0.82	5.6670	4.3	0.0785	3.0	1160	60	1085	35	1048	41	10
BC14-03 S 523	2	322	61	70	0.19	1922	2.125	9.5	0.1916	7.3	0.78	5.2201	7.3	0.0805	6.0	1208	117	1157	65	1130	76	7
BC14-03 S 526	2	192	295	96	1.53	5843	4.906	7.0	0.3092	6.6	0.94	3.2339	6.6	0.1151	2.4	1881	43	1803	59	1737	100	8
BC14-03 S 529	2	156	83	46	0.54	6588	2.803	7.6	0.2409	6.8	0.90	4.1503	6.8	0.0844	3.3	1301	64	1356	57	1392	86	-7

BC14-03 S 532	2	54	65	14	1.19	757	2.168	6.3	0.1917	4.0	0.64	5.2152	4.0	0.0820	4.9	1246	95	1171	44	1131	42	9
BC14-03 S 533	2	110	57	27	0.51	974	2.294	6.4	0.2002	5.2	0.81	4.9955	5.2	0.0831	3.7	1272	72	1210	45	1176	56	8
BC14-03 S 535	2	96	61	57	0.63	3782	10.291	4.6	0.4374	4.2	0.91	2.2863	4.2	0.1706	2.0	2564	33	2461	43	2339	82	9
BC14-03 S 544	2	369	131	84	0.35	3002	2.072	6.1	0.1881	5.7	0.93	5.3170	5.7	0.0799	2.3	1194	45	1139	42	1111	58	7
BC14-03 S 547	2	81	31	22	0.38	2328	2.796	7.2	0.2263	5.6	0.78	4.4181	5.6	0.0896	4.5	1417	87	1354	54	1315	66	7
BC14-03 S 548	2	150	240	54	1.60	608	2.657	5.5	0.2198	4.3	0.79	4.5493	4.3	0.0877	3.4	1375	66	1317	41	1281	50	7
BC14-03 S 551	2	77	29	16	0.37	796	2.073	6.1	0.1877	5.0	0.82	5.3275	5.0	0.0801	3.5	1200	69	1140	42	1109	51	8
BC14-03 S 552	2	80	42	21	0.52	567	2.509	6.3	0.2157	4.4	0.69	4.6358	4.4	0.0843	4.6	1301	89	1275	46	1259	50	3
BC14-03 S 553	2	105	54	15	0.51	2044	1.103	6.4	0.1247	4.9	0.77	8.0213	4.9	0.0642	4.1	747	87	755	34	757	35	-1
BC14-03 S 555	2	166	84	63	0.50	5498	4.519	6.0	0.2961	5.4	0.91	3.3769	5.4	0.1107	2.4	1811	44	1734	50	1672	80	8
BC14-03 S 561	2	94	37	19	0.40	5290	1.867	6.3	0.1787	4.8	0.77	5.5967	4.8	0.0758	4.0	1090	81	1070	42	1060	47	3
BC14-03 S 563	2	52	34	13	0.64	679	2.355	6.3	0.2143	3.4	0.54	4.6669	3.4	0.0797	5.4	1190	106	1229	45	1252	39	-5
BC14-03 S 564	2	173	87	56	0.51	6738	3.089	11.4	0.2483	10.9	0.96	4.0278	10.9	0.0902	3.3	1430	62	1430	87	1430	140	0
BC14-03 S 565	2	41	63	8	1.55	312	1.371	9.0	0.1428	5.3	0.59	7.0045	5.3	0.0696	7.3	917	150	876	53	860	43	6
BC14-03 S 567	2	242	165	70	0.68	2065	2.412	6.8	0.2059	5.8	0.85	4.8562	5.8	0.0850	3.6	1315	70	1246	49	1207	64	8
BC14-03 S 571	2	96	72	33	0.75	895	3.440	7.7	0.2637	6.9	0.89	3.7918	6.9	0.0946	3.5	1520	66	1514	61	1509	93	1

BC14-03 S 574	2	137	58	29	0.42	5507	1.887	6.3	0.1764	5.5	0.87	5.6681	5.5	0.0776	3.1	1136	61	1077	42	1047	53	8
BC14-03 S 579	2	107	39	32	0.37	2324	3.290	5.3	0.2454	4.9	0.92	4.0754	4.9	0.0973	2.0	1572	38	1479	41	1415	62	10
BC14-03 S 587	2	139	35	48	0.25	1717	4.281	5.1	0.2915	4.2	0.81	3.4311	4.2	0.1065	3.0	1741	55	1690	42	1649	60	5
BC14-03 S 597	3	146	47	32	0.32	5324	1.954	5.6	0.1873	5.0	0.89	5.3393	5.0	0.0757	2.6	1087	52	1100	38	1107	51	-2
BC14-03 S 598	3	56	52	14	0.93	250	1.962	8.3	0.1895	5.4	0.65	5.2768	5.4	0.0751	6.3	1071	128	1103	56	1119	55	-4
BC14-03 S 599	3	133	110	106	0.83	18747	15.181	4.5	0.5450	3.9	0.88	1.8350	3.9	0.2020	2.1	2843	35	2827	43	2804	89	1
BC14-03 S 600	3	80	38	27	0.48	1194	3.475	5.7	0.2744	4.7	0.83	3.6442	4.7	0.0918	3.2	1464	61	1521	45	1563	66	-7
BC14-03 S 601	3	73	58	18	0.79	532	2.311	6.6	0.2038	4.5	0.68	4.9056	4.5	0.0822	4.9	1251	95	1216	47	1196	49	4
BC14-03 S 604	3	112	77	36	0.69	2130	3.266	8.3	0.2493	7.0	0.84	4.0105	7.0	0.0950	4.5	1528	85	1473	65	1435	90	6
>10% discordant																						
BC14-03 L 417	1	82	74	26	0.91	1016	2.687	7.9	0.2439	6.9	0.87	4.1005	6.9	0.0799	4.0	1195	78	1325	59	1407	87	-18
BC14-03 L 422	1	121	127	29	1.05	2556	1.839	7.7	0.1707	6.7	0.86	5.8581	6.7	0.0781	3.9	1150	77	1060	51	1016	63	12
BC14-03 L 438	1	62	27	16	0.44	323	2.439	9.0	0.2249	7.3	0.81	4.4474	7.3	0.0787	5.3	1164	104	1254	65	1307	86	-12
BC14-03 L 439	1	72	101	21	1.40	1739	2.039	9.9	0.1990	7.4	0.74	5.0247	7.4	0.0743	6.7	1050	134	1129	68	1170	79	-11
BC14-03 L 440	1	76	33	19	0.43	4762	2.271	8.5	0.2135	7.4	0.86	4.6830	7.4	0.0771	4.3	1125	86	1203	60	1248	84	-11
BC14-03 L 448	1	156	61	40	0.39	10016	2.166	7.6	0.2127	5.8	0.77	4.7023	5.8	0.0739	4.9	1038	98	1170	53	1243	66	-20

BC14-03 L 452	1	83	28	18	0.33	1380	1.824	7.7	0.1847	5.9	0.76	5.4145	5.9	0.0716	5.0	976	101	1054	50	1093	59	-12
BC14-03 L 467	1	44	99	14	2.24	1592	1.703	8.6	0.1808	6.0	0.70	5.5300	6.0	0.0683	6.1	878	126	1010	55	1072	60	-22
BC14-03 L 468	1	58	39	12	0.67	5093	2.010	8.9	0.1648	4.7	0.53	6.0688	4.7	0.0885	7.5	1392	145	1119	60	983	42	29
BC14-03 L 470	1	58	51	16	0.88	304	3.055	9.9	0.1973	6.9	0.70	5.0679	6.9	0.1123	7.1	1837	128	1421	76	1161	73	37
BC14-03 L 472	1	54	22	14	0.41	1029	2.345	12.0	0.2198	9.9	0.82	4.5505	9.9	0.0774	6.8	1131	135	1226	85	1281	115	-13
BC14-03 L 473	2	96	20	21	0.21	2072	2.078	8.6	0.2045	7.8	0.90	4.8910	7.8	0.0737	3.8	1034	77	1142	59	1199	85	-16
BC14-03 L 477	2	51	16	12	0.31	729	2.173	9.2	0.2160	8.1	0.88	4.6291	8.1	0.0730	4.4	1013	89	1172	64	1261	93	-25
BC14-03 L 478	2	45	14	10	0.30	279	2.100	7.9	0.2097	6.4	0.81	4.7682	6.4	0.0726	4.6	1003	93	1149	54	1227	72	-22
BC14-03 L 484	2	43	32	10	0.75	375	1.898	8.4	0.1928	6.6	0.79	5.1866	6.6	0.0714	5.1	969	105	1080	56	1137	69	-17
BC14-03 L 485	2	24	17	6	0.73	153	1.859	13.0	0.1869	5.9	0.46	5.3516	5.9	0.0722	11.6	991	235	1067	86	1104	60	-11
BC14-03 L 486	2	70	51	32	0.73	632	5.136	9.2	0.3609	8.5	0.93	2.7711	8.5	0.1032	3.5	1683	64	1842	78	1986	146	-18
BC14-03 L 488	2	703	215	100	0.31	1334	1.349	8.8	0.1200	8.4	0.96	8.3324	8.4	0.0815	2.6	1234	51	867	51	731	58	41
BC14-03 L 492	2	81	32	23	0.39	862	2.802	11.6	0.2443	10.3	0.88	4.0938	10.3	0.0832	5.5	1274	108	1356	87	1409	130	-11
BC14-03 S 514	2	156	255	71	1.64	1565	4.443	5.2	0.2802	4.8	0.92	3.5692	4.8	0.1150	2.0	1880	37	1720	44	1592	68	15
BC14-03 S 519	2	107	207	50	1.94	2105	4.407	5.2	0.2814	4.4	0.84	3.5541	4.4	0.1136	2.9	1858	52	1714	43	1598	62	14
BC14-03 S 520	2	162	156	39	0.96	1900	1.868	5.3	0.1729	4.4	0.83	5.7848	4.4	0.0784	3.0	1156	59	1070	35	1028	42	11

BC14-03 S 525	2	418	107	79	0.25	5521	1.750	9.6	0.1651	9.2	0.96	6.0554	9.2	0.0768	2.7	1117	54	1027	62	985	84	12
BC14-03 S 528	2	128	115	31	0.90	5760	2.402	5.0	0.1855	3.3	0.66	5.3918	3.3	0.0939	3.7	1507	70	1243	36	1097	33	27
BC14-03 S 530	2	101	62	21	0.61	670	1.852	5.4	0.1719	4.3	0.79	5.8187	4.3	0.0782	3.3	1151	65	1064	35	1022	40	11
BC14-03 S 531	2	103	44	22	0.42	4266	2.116	6.0	0.1822	5.2	0.86	5.4886	5.2	0.0842	3.1	1298	60	1154	42	1079	51	17
BC14-03 S 534	2	256	157	51	0.61	1446	2.029	3.4	0.1607	2.6	0.77	6.2246	2.6	0.0916	2.2	1459	41	1125	23	960	23	34
BC14-03 S 539	2	384	61	76	0.16	32896	1.909	6.2	0.1747	5.5	0.88	5.7245	5.5	0.0793	3.0	1178	58	1084	41	1038	52	12
BC14-03 S 543	2	250	103	67	0.41	3537	3.390	4.7	0.2130	3.6	0.78	4.6938	3.6	0.1154	2.9	1886	52	1502	36	1245	41	34
BC14-03 S 545	2	120	82	38	0.69	3214	3.181	6.7	0.2370	5.9	0.89	4.2201	5.9	0.0974	3.1	1574	58	1452	52	1371	73	13
BC14-03 S 549	2	203	138	51	0.68	826	2.341	11.6	0.1784	4.8	0.41	5.6058	4.8	0.0952	10.6	1532	200	1225	83	1058	46	31
BC14-03 S 550	2	87	43	22	0.49	3259	2.196	8.8	0.2091	7.8	0.88	4.7828	7.8	0.0762	4.1	1099	83	1180	61	1224	86	-11
BC14-03 S 554	2	125	75	27	0.60	1592	1.902	6.5	0.1745	4.9	0.76	5.7313	4.9	0.0791	4.2	1174	83	1082	43	1037	47	12
BC14-03 S 560	2	266	96	82	0.36	7178	3.064	6.5	0.2083	5.9	0.89	4.7999	5.9	0.1067	2.9	1743	54	1424	50	1220	65	30
BC14-03 S 568	2	245	48	64	0.20	26525	2.462	10.5	0.2029	10.3	0.97	4.9293	10.3	0.0880	2.4	1383	46	1261	76	1191	112	14
BC14-03 S 569	2	147	240	57	1.63	1526	3.285	5.2	0.2407	3.7	0.71	4.1544	3.7	0.0990	3.6	1605	68	1477	40	1390	46	13
BC14-03 S 572	2	194	138	73	0.71	8745	3.808	6.4	0.2567	6.1	0.95	3.8962	6.1	0.1076	2.1	1759	38	1594	52	1473	80	16
BC14-03 S 575	2	78	80	20	1.02	1805	2.243	6.1	0.1866	4.8	0.79	5.3585	4.8	0.0872	3.7	1364	72	1195	43	1103	48	19

BC14-03 S 578	2	233	143	67	0.61	6395	2.456	7.4	0.1988	7.1	0.96	5.0312	7.1	0.0896	2.0	1417	39	1259	53	1169	76	18
BC14-03 S 580	2	49	52	8	1.05	777	1.216	8.5	0.1289	6.8	0.79	7.7567	6.8	0.0684	5.2	882	108	808	48	782	50	11
BC14-03 S 581	2	125	20	43	0.16	3602	4.615	4.5	0.2933	4.1	0.91	3.4091	4.1	0.1141	1.8	1866	33	1752	37	1658	60	11
BC14-03 S 584	2	66	37	19	0.56	1414	3.168	6.5	0.2340	5.8	0.89	4.2733	5.8	0.0982	2.9	1590	55	1449	50	1355	71	15
BC14-03 S 586	2	104	93	32	0.89	1491	2.895	5.9	0.2211	4.9	0.84	4.5238	4.9	0.0950	3.1	1528	59	1381	44	1287	58	16
BC14-03 S 588	2	289	51	57	0.18	3539	1.879	4.5	0.1727	3.2	0.72	5.7904	3.2	0.0789	3.1	1169	62	1074	30	1027	31	12
BC14-03 S 589	2	397	227	118	0.57	2656	3.016	6.0	0.2312	5.3	0.89	4.3251	5.3	0.0946	2.7	1520	51	1412	46	1341	65	12
BC14-03 S 590	2	96	99	35	1.04	951	3.669	5.8	0.2569	4.9	0.84	3.8923	4.9	0.1036	3.1	1689	57	1565	46	1474	64	13
BC14-03 S 591	3	80	58	17	0.73	854	1.934	8.9	0.1683	6.1	0.69	5.9427	6.1	0.0834	6.4	1278	125	1093	59	1003	57	22
BC14-03 S 596	3	275	415	71	1.51	13340	1.696	6.9	0.1621	6.2	0.91	6.1689	6.2	0.0759	2.9	1092	57	1007	44	968	56	11
BC14-03 S 603	3	369	319	38	0.87	4393	0.679	6.9	0.0764	5.5	0.80	13.0888	5.5	0.0644	4.1	756	88	526	28	475	25	37
BC14-03 S 607	3	51	62	14	1.22	384	2.578	8.5	0.2000	4.4	0.52	5.0005	4.4	0.0935	7.3	1498	138	1294	62	1175	47	22

		Composition								**Corrected isotope ratios**									**Apparent ages (Ma)**			
Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{235}U$	±2s (%)	$^{206}Pb/^{238}U$	±2s (%)	error corr.	$^{238}U/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (abs)	$^{207}Pb/^{235}U$	±2s (abs)	$^{206}Pb/^{238}U$	±2s (abs)	% disc.

BC14-04
<10% discordant

BC14-04 L 1291	1	80	62	65	0.77	3183	13.905	10.6	0.4968	9.7	0.91	2.0128	9.7	0.2030	4.5	2850	73	2743	101	2756	202	3
BC14-04 L 1292	1	84	120	67	1.42	2314	12.362	5.7	0.4654	5.1	0.89	2.1488	5.1	0.1927	2.6	2765	42	2632	53	2607	102	6
BC14-04 L 1293	1	40	82	39	2.08	379	17.057	7.2	0.5528	5.1	0.71	1.8088	5.1	0.2238	5.1	3008	82	2938	69	2837	118	6
BC14-04 L 1295	1	69	81	65	1.17	13969	19.310	7.5	0.5722	6.8	0.90	1.7477	6.8	0.2448	3.2	3151	51	3057	73	3054	157	3
BC14-04 L 1296	1	34	33	29	0.99	604	20.137	5.5	0.6003	4.7	0.85	1.6657	4.7	0.2433	2.9	3141	47	3098	53	3031	113	4
BC14-04 L 1297	1	33	53	32	1.57	866	21.118	6.3	0.5969	5.3	0.84	1.6753	5.3	0.2566	3.4	3226	53	3144	61	3017	127	6
BC14-04 L 1299	1	71	54	44	0.76	912	10.635	5.8	0.4414	4.7	0.82	2.2653	4.7	0.1747	3.4	2603	61	2482	65	2357	117	9
BC14-04 L 1300	1	89	85	60	0.96	1082	11.077	5.4	0.4540	3.7	0.68	2.2027	3.7	0.1770	3.9	2625	70	2472	63	2413	102	8
BC14-04 L 1301	1	242	187	148	0.77	3178	10.644	5.6	0.4443	5.2	0.92	2.2509	5.2	0.1738	2.2	2594	44	1994	98	2370	124	9
BC14-04 L 1302	1	216	375	165	1.74	3081	11.131	6.1	0.4580	5.7	0.92	2.1836	5.7	0.1763	2.4	2618	46	2103	98	2431	135	7
BC14-04 L 1303	1	164	182	151	1.11	7901	20.551	6.2	0.5894	5.7	0.93	1.6966	5.7	0.2529	2.3	3203	42	2679	103	2987	161	7
BC14-04 L 1310	1	67	50	43	0.74	5094	10.708	9.2	0.4595	8.3	0.90	2.1762	8.3	0.1690	4.1	2548	68	2498	86	2437	168	4
BC14-04 L 1312	1	220	262	208	1.19	7599	20.063	7.1	0.5863	6.3	0.89	1.7055	6.3	0.2482	3.3	3173	57	2473	133	2975	172	6
BC14-04 L 1314	1	40	50	42	1.25	2315	23.513	9.4	0.6800	8.5	0.90	1.4706	8.5	0.2508	4.0	3190	64	3248	91	3344	221	-5
BC14-04 L 1316	1	119	165	119	1.38	2599	20.110	9.5	0.5949	8.6	0.91	1.6809	8.6	0.2452	3.9	3154	66	2891	117	3009	224	5
BC14-04 L 1317	1	41	47	41	1.14	1013	21.434	9.3	0.6598	7.8	0.84	1.5155	7.8	0.2356	5.1	3090	81	3158	90	3267	199	-6

BC14-04 L 1318	1	265	131	176	0.49	8543	11.944	9.9	0.5020	9.6	0.97	1.9921	9.6	0.1726	2.5	2583	48	1994	175	2622	220	-2
BC14-04 L 1320	1	219	176	173	0.80	10530	16.345	6.8	0.5360	6.1	0.90	1.8657	6.1	0.2212	3.0	2989	53	2365	118	2767	159	7
BC14-04 L 1322	1	287	278	222	0.97	4451	14.292	8.2	0.5166	7.5	0.92	1.9359	7.5	0.2007	3.3	2832	58	2068	160	2685	182	5
BC14-04 L 1326	1	18	15	16	0.83	2228	20.765	7.5	0.6225	5.8	0.77	1.6063	5.8	0.2419	4.8	3133	76	3128	73	3120	143	0
BC14-04 L 1328	1	189	192	169	1.01	3711	19.083	6.3	0.5639	5.5	0.87	1.7733	5.5	0.2454	3.1	3156	54	2536	108	2883	151	9
BC14-04 L 1330	1	143	74	151	0.52	49909	33.264	6.0	0.7110	5.3	0.89	1.4064	5.3	0.3393	2.7	3660	46	3057	110	3462	171	5
BC14-04 L 1331	1	111	145	82	1.31	1917	10.687	5.8	0.4596	5.3	0.91	2.1758	5.3	0.1687	2.4	2544	46	2357	72	2438	130	4
BC14-04 L 1335	1	64	43	40	0.67	2132	10.108	6.4	0.4465	5.7	0.89	2.2394	5.7	0.1642	2.9	2499	53	2433	69	2380	134	5
BC14-04 L 1338	1	71	54	44	0.77	10267	10.272	4.7	0.4545	4.4	0.93	2.2004	4.4	0.1639	1.7	2497	36	2432	57	2415	114	3
BC14-04 L 1339	1	71	84	59	1.19	3399	14.251	7.2	0.5479	6.9	0.96	1.8251	6.9	0.1886	2.1	2730	42	2708	82	2816	177	-3
BC14-04 L 1340	1	87	168	78	1.94	4880	14.012	6.9	0.5228	6.5	0.95	1.9128	6.5	0.1944	2.2	2780	42	2652	81	2711	164	2
BC14-04 L 1341	1	51	55	62	1.06	1241	37.659	4.5	0.7414	4.2	0.94	1.3487	4.2	0.3684	1.6	3785	31	3648	61	3576	151	6
BC14-04 L 1342	1	48	43	44	0.91	791	20.065	5.6	0.6002	3.2	0.58	1.6661	3.2	0.2425	4.6	3136	75	3077	66	3031	116	3
BC14-04 L 1345	1	78	109	74	1.39	3656	19.821	5.3	0.5867	4.1	0.78	1.7046	4.1	0.2450	3.3	3153	56	2954	68	2976	129	6
BC14-04 L 1347	1	25	46	27	1.88	445	22.529	6.1	0.6696	5.3	0.86	1.4935	5.3	0.2440	3.1	3146	50	3207	60	3304	136	-5
BC14-04 L 1352	1	354	120	205	0.34	4638	10.534	4.5	0.4420	4.2	0.92	2.2622	4.2	0.1728	1.7	2585	36	1575	125	2360	108	9

BC14-04 L 1357	1	357	184	240	0.52	20579	13.513	7.9	0.4970	7.3	0.93	2.0121	7.3	0.1972	2.9	2803	52	1629	226	2601	174	7
BC14-04 L 1358	1	30	35	29	1.14	1138	21.820	10.4	0.6325	8.4	0.81	1.5811	8.4	0.2502	6.1	3186	97	3176	101	3159	210	1
BC14-04 L 1360	1	209	192	142	0.92	3359	10.662	6.6	0.4691	5.7	0.86	2.1318	5.7	0.1648	3.3	2506	60	2151	93	2480	138	1
BC14-04 L 1361	1	103	130	88	1.26	2692	14.130	10.3	0.5512	9.6	0.92	1.8141	9.6	0.1859	3.9	2706	68	2647	115	2830	234	-5
BC14-04 L 1362	1	135	167	100	1.24	7328	11.156	9.9	0.4808	8.9	0.90	2.0797	8.9	0.1683	4.3	2541	75	2410	109	2531	200	0
BC14-04 L 1364	1	78	138	66	1.76	462	12.388	6.7	0.4784	5.8	0.87	2.0903	5.8	0.1878	3.4	2723	59	2615	73	2520	141	7
BC14-04 L 1365	2	70	78	50	1.11	837	10.875	7.6	0.4650	6.6	0.87	2.1504	6.6	0.1696	3.8	2554	63	2513	71	2462	136	4
BC14-04 L 1368	2	18	20	17	1.14	820	22.152	8.1	0.6358	6.6	0.82	1.5728	6.6	0.2527	4.7	3202	74	3190	79	3172	166	1
BC14-04 L 1369	2	13	12	11	0.97	158	21.438	8.4	0.6384	7.1	0.85	1.5663	7.1	0.2435	4.4	3143	70	3159	81	3183	179	-1
BC14-04 L 1372	2	64	73	61	1.15	8287	19.723	5.7	0.5953	5.3	0.93	1.6797	5.3	0.2403	2.1	3122	34	3078	55	3011	127	4
BC14-04 L 1373	2	42	42	38	1.00	961	20.184	7.7	0.5869	7.0	0.91	1.7040	7.0	0.2494	3.2	3181	51	3100	74	2977	167	6
BC14-04 L 1377	2	88	135	74	1.53	1223	12.782	8.0	0.5080	7.1	0.89	1.9684	7.1	0.1825	3.7	2676	61	2664	75	2648	154	1
BC14-04 L 1379	2	221	89	157	0.40	12119	15.740	4.8	0.5311	4.3	0.88	1.8829	4.3	0.2149	2.3	2943	37	2861	46	2746	95	7
BC14-04 S 6	3	57	39	35	0.69	37547	9.650	7.5	0.4515	6.6	0.88	2.2146	6.6	0.1550	3.5	2402	60	2402	69	2402	133	0
BC14-04 S 8	3	334	454	329	1.36	12960	20.954	5.3	0.6004	4.5	0.85	1.6654	4.5	0.2531	2.7	3204	43	3136	51	3032	109	5
BC14-04 S 20	3	25	27	23	1.08	1141	20.928	8.1	0.6159	7.7	0.95	1.6237	7.7	0.2465	2.6	3162	42	3135	79	3093	189	2

BC14-04 S 213 4	198	314	151	1.58	31126	11.001	5.8	0.4669	5.4	0.94	2.1419	5.4	0.1709	2.0	2566	34	2523	54	2470	112
BC14-04 S 233 10	112	107	75	0.96	13666	10.932	21.7	0.4443	21.3	0.98	2.2510	21.3	0.1785	4.3	2639	71	2517	202	2370	422
BC14-04 S 243 5	124	175	112	1.41	6032	16.484	5.7	0.5490	5.0	0.88	1.8215	5.0	0.2178	2.6	2964	43	2905	54	2821	114
BC14-04 S 283 7	142	126	112	0.89	1445	14.994	5.6	0.5211	5.1	0.90	1.9189	5.1	0.2087	2.4	2895	39	2815	53	2704	112
BC14-04 S 313 8	273	279	173	1.02	48794	9.303	5.3	0.4214	5.1	0.96	2.3729	5.1	0.1601	1.5	2457	25	2368	49	2267	97
BC14-04 S 433 8	251	277	156	1.11	36477	9.403	6.2	0.4214	6.0	0.97	2.3732	6.0	0.1618	1.4	2475	24	2378	57	2267	115
BC14-04 S 503 -4	209	130	177	0.62	4772	18.175	10.2	0.6115	9.3	0.92	1.6352	9.3	0.2155	4.0	2948	65	2999	98	3076	228
BC14-04 S 523 4	170	138	106	0.81	9083	9.412	7.5	0.4356	6.5	0.87	2.2955	6.5	0.1567	3.8	2420	64	2379	69	2331	128
BC14-04 S 533 8	68	75	56	1.10	952	15.733	7.4	0.5236	6.7	0.91	1.9099	6.7	0.2179	3.1	2965	51	2861	71	2714	148
BC14-04 S 593 3	64	76	63	1.18	1883	20.166	4.4	0.6034	3.9	0.88	1.6573	3.9	0.2424	2.1	3136	33	3099	43	3043	95
BC14-04 S 643 10	248	186	215	0.75	15389	20.570	3.5	0.5749	3.2	0.92	1.7395	3.2	0.2595	1.4	3244	22	3119	34	2928	75
BC14-04 S 653 5	203	388	208	1.91	6783	16.429	4.2	0.5496	3.9	0.94	1.8196	3.9	0.2168	1.5	2957	23	2902	40	2823	89
BC14-04 S 673 9	167	80	122	0.48	3205	15.238	4.0	0.5159	3.7	0.92	1.9385	3.7	0.2142	1.6	2938	25	2830	39	2682	82
BC14-04 S 683 7	308	282	192	0.91	9554	9.243	4.1	0.4222	3.8	0.92	2.3683	3.8	0.1588	1.6	2443	28	2362	38	2271	73
BC14-04 S 743 3	42	60	33	1.44	735	12.696	4.6	0.4983	3.6	0.79	2.0069	3.6	0.1848	2.8	2696	47	2657	43	2606	77
BC14-04 S 773 6	140	169	128	1.21	5471	18.486	7.8	0.5700	7.2	0.92	1.7545	7.2	0.2352	3.1	3088	49	3015	76	2908	169

BC14-04 S 783	111	141	75	1.28	3323	10.184	9.9	0.4400	9.5	0.95	2.2727	9.5	0.1679	3.0	2536	50	2452	92	2351	187
7																				
BC14-04 S 803	186	348	150	1.88	4080	10.485	5.1	0.4455	4.9	0.94	2.2446	4.9	0.1707	1.7	2564	28	2479	48	2375	97
7																				
BC14-04 S 863	130	99	102	0.76	4243	15.989	4.2	0.5369	3.9	0.94	1.8626	3.9	0.2160	1.5	2951	23	2876	40	2770	89
6																				
BC14-04 S 903	166	165	103	0.99	4847	9.973	4.8	0.4270	4.4	0.92	2.3422	4.4	0.1694	1.9	2552	31	2432	44	2292	84
10																				
BC14-04 S 913	121	152	85	1.26	2166	11.046	5.3	0.4632	5.1	0.96	2.1587	5.1	0.1729	1.5	2586	26	2527	50	2454	104
5																				
BC14-04 S 933	26	39	24	1.51	877	19.844	6.3	0.5842	5.4	0.86	1.7118	5.4	0.2464	3.2	3162	51	3084	61	2966	129
6																				
BC14-04 S 963	127	180	123	1.42	15992	19.374	5.0	0.5931	4.6	0.92	1.6859	4.6	0.2369	1.9	3099	31	3061	48	3002	111
3																				
BC14-04 S 973	224	158	189	0.71	3846	19.458	6.9	0.5874	6.2	0.90	1.7024	6.2	0.2402	3.1	3122	49	3065	67	2979	148
5																				
BC14-04 S 100	3	77	150	77	1.95	3158	17.124	6.2	0.5433	5.0	0.81	1.8407	5.0	0.2286	3.6	3042	57	2942	59	2797
114 8																				
BC14-04 S 101	3	104	67	79	0.64	6313	16.591	5.3	0.5308	4.6	0.87	1.8838	4.6	0.2267	2.6	3029	42	2911	51	2745
103 9																				
BC14-04 S 104	3	42	72	36	1.72	897	12.873	6.7	0.4915	5.8	0.87	2.0345	5.8	0.1900	3.2	2742	53	2670	63	2577
124 6																				
BC14-04 S 109	3	55	104	53	1.88	3760	15.781	3.8	0.5306	3.6	0.93	1.8845	3.6	0.2157	1.4	2949	22	2864	37	2744
80 7																				
BC14-04 S 112	3	98	147	91	1.50	68150	16.132	3.5	0.5452	3.3	0.94	1.8343	3.3	0.2146	1.2	2941	19	2885	34	2805
76 5																				
BC14-04 S 114	3	113	130	95	1.16	4998	15.485	3.7	0.5228	3.3	0.88	1.9127	3.3	0.2148	1.8	2942	29	2846	36	2711
73 8																				
BC14-04 S 115	3	172	34	93	0.20	3503	10.263	3.2	0.4359	2.7	0.84	2.2939	2.7	0.1707	1.8	2565	29	2459	30	2332
53 9																				
BC14-04 S 118	3	123	164	108	1.33	15090	15.836	3.7	0.5318	3.3	0.91	1.8802	3.3	0.2159	1.5	2951	25	2867	35	2749
75 7																				

BC14-04 S 124	3	119	151	104	1.27	2280	15.787	4.4	0.5275	4.1	0.95	1.8956	4.1	0.2170	1.3	2959	22	2864	42	2731	92	8
BC14-04 S 126	3	219	338	164	1.54	4750	10.212	4.3	0.4367	4.1	0.93	2.2901	4.1	0.1696	1.6	2554	26	2454	40	2336	79	9
BC14-04 S 128	3	263	161	160	0.61	3797	10.356	8.2	0.4401	8.0	0.98	2.2722	8.0	0.1707	1.5	2564	25	2467	76	2351	158	8
BC14-04 S 130	3	278	173	235	0.62	19927	20.479	4.5	0.5735	3.9	0.88	1.7437	3.9	0.2590	2.2	3240	34	3114	44	2922	93	10
BC14-04 S 134	3	195	89	141	0.46	23302	15.788	10.6	0.5344	10.4	0.98	1.8714	10.4	0.2143	2.3	2938	38	2864	101	2760	232	6
>10% discordant																						
BC14-04 L 1294	1	123	97	67	0.78	6066	8.149	5.4	0.3518	4.9	0.91	2.8421	4.9	0.1680	2.3	2538	38	2248	49	2137	79	16
BC14-04 L 1298	1	46	61	34	1.33	4474	14.265	6.5	0.4792	5.4	0.83	2.0869	5.4	0.2159	3.6	2950	58	2768	62	2524	113	14
BC14-04 L 1304	1	134	127	116	0.95	23037	19.563	5.6	0.5594	5.3	0.94	1.7877	5.3	0.2536	2.0	3208	38	2836	80	2864	146	11
BC14-04 L 1305	1	79	85	69	1.07	5464	19.143	3.9	0.5551	3.3	0.85	1.8013	3.3	0.2501	2.1	3185	39	2977	56	2847	112	11
BC14-04 L 1309	1	540	430	330	0.80	25158	14.003	8.6	0.4094	8.1	0.94	2.4427	8.1	0.2481	2.8	3173	50	988	476	2212	166	30
BC14-04 L 1313	1	376	491	271	1.31	251	12.302	11.7	0.4080	8.2	0.70	2.4510	8.2	0.2187	8.3	2971	136	1879	189	2206	166	26
BC14-04 L 1315	1	59	82	58	1.39	11150	20.862	9.0	0.5595	8.1	0.90	1.7875	8.1	0.2704	3.9	3309	61	3132	87	2864	188	13
BC14-04 L 1323	1	138	109	81	0.79	4847	9.488	6.7	0.4132	6.1	0.91	2.4202	6.1	0.1665	2.8	2523	53	2256	79	2229	132	12
BC14-04 L 1324	1	370	391	157	1.06	4660	6.233	7.6	0.2853	7.2	0.95	3.5056	7.2	0.1585	2.4	2440	47	1651	102	1618	115	34
BC14-04 L 1327	1	223	194	50	0.87	13156	3.972	11.1	0.1408	10.3	0.93	7.1027	10.3	0.2046	4.0	2863	69	1614	96	849	87	70

BC14-04 L 1329	1	1297	328	246	0.25	749	3.676	6.0	0.1443	5.1	0.85	6.9288	5.1	0.1847	3.1	2696	56	404	157	869	51	68
BC14-04 L 1333	1	224	378	185	1.69	7783	15.193	5.5	0.4531	4.9	0.90	2.2069	4.9	0.2432	2.4	3141	44	2279	102	2409	122	23
BC14-04 L 1334	1	197	164	120	0.83	12999	9.641	6.7	0.4182	6.1	0.91	2.3910	6.1	0.1672	2.8	2530	52	2016	99	2252	134	11
BC14-04 L 1337	1	145	122	81	0.84	924	8.885	2.7	0.4003	2.1	0.76	2.4984	2.1	0.1610	1.8	2466	38	2187	47	2170	75	12
BC14-04 L 1344	1	241	364	192	1.51	2098	15.965	7.4	0.4839	7.2	0.97	2.0666	7.2	0.2393	1.9	3115	38	2243	144	2544	168	18
BC14-04 L 1350	1	175	163	91	0.93	3944	7.534	5.4	0.3482	5.0	0.93	2.8717	5.0	0.1569	2.0	2423	42	2010	68	1926	102	20
BC14-04 L 1355	1	18	22	28	1.20	223	32.910	14.8	0.8141	11.2	0.76	1.2283	11.2	0.2932	9.7	3435	150	3578	146	3839	325	-12
BC14-04 L 1356	1	45	26	27	0.58	977	13.037	6.9	0.4486	5.9	0.86	2.2292	5.9	0.2108	3.5	2912	57	2682	65	2389	118	18
BC14-04 L 1359	1	425	743	319	1.75	215	10.990	13.9	0.3799	7.7	0.56	2.6321	7.7	0.2098	11.6	2904	189	1710	200	2076	151	29
BC14-04 L 1363	1	290	47	177	0.16	3893	15.271	6.7	0.4747	5.5	0.82	2.1067	5.5	0.2333	3.9	3075	65	2171	124	2504	135	19
BC14-04 L 1366	2	127	190	89	1.50	2560	9.816	5.9	0.4154	5.6	0.94	2.4074	5.6	0.1714	2.0	2571	33	2418	54	2240	105	13
BC14-04 L 1367	2	201	177	127	0.88	20191	10.142	5.8	0.4283	5.3	0.92	2.3349	5.3	0.1718	2.2	2575	37	2448	54	2298	103	11
BC14-04 L 1370	2	393	34	246	0.09	20938	15.877	5.4	0.4928	4.9	0.92	2.0294	4.9	0.2337	2.2	3077	35	2869	52	2583	105	16
BC14-04 L 1371	2	363	1262	365	3.48	10723	11.424	6.1	0.4270	5.2	0.86	2.3419	5.2	0.1940	3.1	2777	51	2558	57	2292	101	17
BC14-04 L 1376	2	184	107	112	0.59	2584	10.658	6.6	0.4370	5.8	0.88	2.2884	5.8	0.1769	3.2	2624	53	2494	61	2337	114	11
BC14-04 S 9	3	744	524	210	0.70	9064	5.396	8.8	0.2118	7.4	0.85	4.7207	7.4	0.1848	4.7	2696	77	1884	75	1239	84	54

BC14-04 S 123 16	160	155	99	0.97	1971	9.916	8.1	0.4076	7.4	0.91	2.4533	7.4	0.1764	3.4	2620	57	2427	75	2204	138
BC14-04 S 143 32	666	285	266	0.43	24281	7.125	6.2	0.3070	5.8	0.94	3.2568	5.8	0.1683	2.2	2541	36	2127	55	1726	88
BC14-04 S 153 17	275	139	148	0.51	18280	9.887	4.4	0.4035	3.2	0.74	2.4781	3.2	0.1777	3.0	2632	49	2424	41	2185	60
BC14-04 S 163 56	535	391	169	0.73	786	6.910	5.9	0.2260	4.9	0.83	4.4252	4.9	0.2218	3.2	2994	52	2100	52	1313	58
BC14-04 S 193 19	325	189	164	0.58	8687	8.547	4.9	0.3736	4.5	0.91	2.6764	4.5	0.1659	2.0	2517	33	2291	44	2047	78
BC14-04 S 253 34	328	244	164	0.74	1286	9.232	13.7	0.3353	8.2	0.60	2.9827	8.2	0.1997	11.0	2824	180	2361	125	1864	132
BC14-04 S 293 49	587	1197	244	2.04	21335	4.755	9.5	0.2149	9.1	0.96	4.6535	9.1	0.1605	2.6	2461	44	1777	79	1255	104
BC14-04 S 343 15	123	164	99	1.33	1284	14.231	7.5	0.4771	7.3	0.98	2.0958	7.3	0.2163	1.6	2954	27	2765	71	2515	153
BC14-04 S 353 14	222	195	162	0.88	551	12.511	8.0	0.4577	6.5	0.81	2.1851	6.5	0.1983	4.7	2812	77	2644	76	2429	132
BC14-04 S 363 37	273	242	145	0.89	2884	9.343	6.0	0.3275	5.6	0.93	3.0537	5.6	0.2069	2.2	2882	36	2372	55	1826	89
BC14-04 S 373 26	231	224	147	0.97	3604	12.527	2.9	0.4094	1.8	0.63	2.4427	1.8	0.2219	2.3	2995	37	2645	27	2212	34
BC14-04 S 393 13	264	134	175	0.51	7005	13.727	4.2	0.4763	3.8	0.90	2.0996	3.8	0.2090	1.8	2898	30	2731	40	2511	78
BC14-04 S 413 29	533	224	343	0.42	5063	18.804	6.4	0.4592	5.9	0.93	2.1775	5.9	0.2970	2.4	3454	37	3032	61	2436	119
BC14-04 S 423 33	310	206	128	0.66	9883	7.232	8.0	0.3058	7.9	0.98	3.2699	7.9	0.1715	1.6	2572	26	2140	71	1720	119
BC14-04 S 453 42	628	300	229	0.48	79441	7.022	4.8	0.2762	3.9	0.82	3.6209	3.9	0.1844	2.7	2693	45	2114	42	1572	55
BC14-04 S 543 61	1094	190	190	0.17	2362	2.872	6.0	0.1455	5.1	0.84	6.8740	5.1	0.1432	3.2	2266	55	1375	45	876	41

BC14-04 S 583	363	71	209	0.20	7668	12.827	4.5	0.4519	4.3	0.96	2.2130	4.3	0.2059	1.3	2873	22	2667	43	2404	87	16
BC14-04 S 613	250	366	176	1.46	46868	9.829	3.2	0.4163	2.9	0.91	2.4019	2.9	0.1712	1.3	2570	22	2419	29	2244	55	13
BC14-04 S 623	412	245	243	0.60	79011	12.415	5.2	0.4167	5.1	0.97	2.3999	5.1	0.2161	1.4	2952	22	2636	49	2245	96	24
BC14-04 S 633	290	176	208	0.61	3072	15.023	4.7	0.4890	3.7	0.78	2.0449	3.7	0.2228	3.0	3001	48	2817	45	2566	77	14
BC14-04 S 663	455	211	278	0.46	8837	18.208	8.0	0.4263	7.9	0.99	2.3459	7.9	0.3098	1.2	3520	18	3001	77	2289	153	35
BC14-04 S 693	593	745	321	1.26	16131	8.047	9.7	0.3263	9.6	0.99	3.0643	9.6	0.1788	1.6	2642	26	2236	88	1821	152	31
BC14-04 S 703	558	466	396	0.84	6975	21.864	8.1	0.4796	8.0	0.98	2.0853	8.0	0.3307	1.5	3620	23	3178	79	2525	167	30
BC14-04 S 723	390	268	215	0.69	4809	9.946	5.3	0.3796	5.1	0.96	2.6341	5.1	0.1900	1.4	2742	24	2430	49	2075	91	24
BC14-04 S 763	385	256	218	0.66	4986	9.401	7.0	0.4051	6.7	0.95	2.4687	6.7	0.1683	2.3	2541	38	2378	65	2192	124	14
BC14-04 S 823	295	193	158	0.65	3170	9.566	5.0	0.3793	4.5	0.90	2.6363	4.5	0.1829	2.2	2679	36	2394	46	2073	80	23
BC14-04 S 833	1298	1141	246	0.88	655	3.100	5.5	0.1279	5.3	0.97	7.8190	5.3	0.1758	1.3	2613	22	1433	42	776	39	70
BC14-04 S 843	231	138	146	0.60	2736	11.722	3.8	0.4536	3.7	0.96	2.2048	3.7	0.1874	1.0	2720	17	2582	36	2411	74	11
BC14-04 S 923	128	223	95	1.74	3344	11.378	5.2	0.4409	4.6	0.87	2.2680	4.6	0.1872	2.6	2717	42	2555	49	2355	90	13
BC14-04 S 943	89	51	87	0.57	11786	22.648	9.4	0.7074	9.0	0.96	1.4135	9.0	0.2322	2.8	3067	44	3212	91	3449	239	-12
BC14-04 S 953	173	149	106	0.86	6885	10.058	5.3	0.4241	4.8	0.91	2.3581	4.8	0.1720	2.2	2577	37	2440	49	2279	93	12
BC14-04 S 1023	304	179	158	0.59	10227	8.562	8.3	0.3789	8.1	0.98	2.6392	8.1	0.1639	1.7	2496	29	2293	75	2071	143	17

BC14-04 S 103	3	204	81	117	0.40	3323	10.346	6.5	0.4325	6.3	0.97	2.3122	6.3	0.1735	1.6	2592	26	2466	60	2317	123	11
BC14-04 S 106	3	161	198	108	1.23	1577	10.166	4.9	0.4275	4.7	0.95	2.3391	4.7	0.1725	1.6	2582	27	2450	45	2294	90	11
BC14-04 S 107	3	193	78	126	0.40	5056	13.930	3.9	0.4820	3.0	0.76	2.0747	3.0	0.2096	2.5	2902	41	2745	37	2536	62	13
BC14-04 S 110	3	122	225	113	1.85	3763	16.170	4.3	0.4852	4.2	0.97	2.0610	4.2	0.2417	1.1	3131	18	2887	41	2550	88	19
BC14-04 S 113	3	269	123	131	0.46	1635	7.573	5.5	0.3675	4.9	0.89	2.7208	4.9	0.1494	2.5	2339	43	2182	49	2018	85	14
BC14-04 S 116	3	174	109	102	0.62	7813	12.645	3.3	0.4050	2.8	0.84	2.4693	2.8	0.2264	1.8	3027	29	2654	31	2192	52	28
BC14-04 S 119	3	85	151	69	1.78	4464	11.428	4.0	0.4490	3.0	0.76	2.2273	3.0	0.1846	2.6	2695	43	2559	37	2391	60	11
BC14-04 S 120	3	391	239	307	0.61	12932	23.926	2.7	0.5213	2.4	0.86	1.9184	2.4	0.3329	1.4	3631	21	3265	27	2705	53	26
BC14-04 S 121	3	213	184	126	0.86	3163	8.700	6.8	0.3960	6.3	0.93	2.5256	6.3	0.1594	2.5	2449	42	2307	62	2150	116	12
BC14-04 S 122	3	416	256	234	0.62	112270	9.650	2.5	0.4052	2.1	0.85	2.4679	2.1	0.1727	1.3	2584	22	2402	23	2193	40	15
BC14-04 S 123	3	384	172	261	0.45	5562	15.336	13.2	0.4919	13.2	0.99	2.0330	13.2	0.2261	1.3	3025	21	2836	126	2579	280	15
BC14-04 S 129	3	50	39	34	0.78	1139	14.589	6.4	0.4706	5.1	0.80	2.1250	5.1	0.2248	3.9	3016	62	2789	61	2486	105	18
BC14-04 S 131	3	204	265	150	1.30	2565	12.341	4.3	0.4340	4.1	0.94	2.3039	4.1	0.2062	1.5	2876	24	2631	41	2324	80	19
BC14-04 S 132	3	345	290	187	0.84	14121	8.667	3.2	0.3826	2.9	0.92	2.6140	2.9	0.1643	1.3	2501	22	2304	29	2088	52	16
BC14-04 S 133	3	169	161	106	0.95	2593	11.593	6.1	0.3860	5.8	0.96	2.5904	5.8	0.2178	1.8	2964	28	2572	57	2104	105	29

Composition **Corrected isotope ratios** **Apparent ages (Ma)**

Analysis notes	U ppm	Th ppm	Pb ppm	Th/U	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{235}U$	±2s (%)	$^{206}Pb/^{238}U$	±2s (%)	error corr.	$^{238}U/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (abs)	$^{207}Pb/^{235}U$	±2s (abs)	$^{206}Pb/^{238}U$	±2s (abs)	% disc.
BC14-05																					
<10% discordant																					
BC14-05 L 148		1	35	9	12	0.26	494	4.857	8.4	0.3145	5.4	0.64	3.1800	5.4	0.1120	6.5	1832	117	1795	71	1763
83	4																				
BC14-05 L 151		1	111	48	40	0.43	2085	4.140	6.5	0.2806	5.9	0.92	3.5632	5.9	0.1070	2.6	1749	47	1662	53	1595
84	9																				
BC14-05 L 154		1	41	27	17	0.65	39486	4.960	7.1	0.3345	5.8	0.82	2.9894	5.8	0.1075	4.1	1758	74	1812	60	1860
93	-6																				
BC14-05 L 155		1	151	60	60	0.40	561	5.252	7.0	0.3207	6.3	0.89	3.1177	6.3	0.1187	3.2	1937	57	1861	60	1793
98	7																				
BC14-05 L 156		1	225	74	81	0.33	6448	4.553	7.7	0.3014	6.3	0.81	3.3177	6.3	0.1095	4.5	1792	82	1741	64	1698
94	5																				
BC14-05 L 157		1	147	79	44	0.54	63	3.264	11.8	0.2635	6.5	0.56	3.7944	6.5	0.0898	9.8	1422	187	1472	92	1508
88	-6																				
BC14-05 L 166		1	147	119	61	0.81	732	4.499	7.1	0.3100	5.4	0.77	3.2259	5.4	0.1053	4.5	1719	83	1731	59	1741
82	-1																				
BC14-05 L 167		1	191	75	64	0.39	1573	3.945	4.3	0.2720	3.8	0.88	3.6760	3.8	0.1052	2.0	1717	37	1623	35	1551
52	10																				
BC14-05 L 180		1	259	148	99	0.57	3956	4.415	6.4	0.2932	6.1	0.94	3.4111	6.1	0.1092	2.1	1787	39	1715	53	1657
89	7																				
BC14-05 L 185		1	209	147	87	0.70	371	4.872	8.9	0.3273	7.7	0.86	3.0549	7.7	0.1079	4.5	1765	82	1797	75	1825
122	-3																				
BC14-05 L 195		1	109	49	38	0.45	586	4.281	5.3	0.2890	3.7	0.69	3.4606	3.7	0.1075	3.9	1757	71	1690	44	1636
53	7																				
BC14-05 L 196		1	351	125	124	0.36	5090	4.275	4.7	0.2861	4.2	0.89	3.4957	4.2	0.1084	2.2	1772	40	1689	39	1622
60	8																				
BC14-05 S 206		1	100	86	68	0.86	1178	11.430	7.4	0.4806	6.6	0.90	2.0806	6.6	0.1725	3.2	2582	54	2559	69	2530
139	2																				

BC14-05 S 213	1	123	57	44	0.46	2918	3.947	6.5	0.2834	5.4	0.84	3.5284	5.4	0.1010	3.6	1643	66	1623	53	1609	77	2
BC14-05 S 219	1	133	80	109	0.60	3975	14.340	9.0	0.5510	8.8	0.98	1.8147	8.8	0.1887	1.8	2731	30	2772	85	2830	201	-4
BC14-05 S 221	1	216	131	84	0.61	1806	4.295	5.2	0.2895	5.0	0.96	3.4537	5.0	0.1076	1.4	1759	26	1692	43	1639	72	7
BC14-05 S 222	1	108	61	39	0.56	10492	3.837	6.8	0.2737	6.1	0.89	3.6536	6.1	0.1017	3.1	1655	58	1601	55	1560	84	6
BC14-05 S 223	1	196	89	71	0.46	4893	4.240	4.9	0.2818	4.6	0.94	3.5485	4.6	0.1091	1.7	1785	30	1682	40	1600	65	10
BC14-05 S 224	1	133	106	44	0.80	3410	2.925	6.8	0.2340	6.4	0.94	4.2729	6.4	0.0906	2.2	1439	43	1388	51	1356	78	6
BC14-05 S 227	1	255	120	92	0.47	7136	4.115	5.1	0.2781	4.6	0.90	3.5958	4.6	0.1073	2.2	1754	40	1657	42	1582	65	10
BC14-05 S 229	1	90	88	42	0.97	6053	4.539	5.2	0.3173	4.6	0.87	3.1519	4.6	0.1038	2.5	1692	47	1738	43	1776	71	-5
BC14-05 S 230	1	232	195	69	0.84	2173	2.619	6.0	0.2158	4.6	0.77	4.6348	4.6	0.0881	3.8	1384	74	1306	44	1259	53	9
BC14-05 S 232	1	103	19	42	0.19	3231	5.202	6.3	0.3493	5.8	0.92	2.8632	5.8	0.1080	2.5	1766	46	1853	54	1931	96	-9
BC14-05 S 233	1	223	55	76	0.25	816	4.302	3.8	0.2838	3.3	0.87	3.5236	3.3	0.1099	1.9	1799	35	1694	32	1610	48	10
BC14-05 S 234	1	27	11	7	0.41	112	2.765	8.3	0.2213	5.7	0.68	4.5183	5.7	0.0906	6.1	1439	116	1346	62	1289	67	10
BC14-05 S 236	1	60	73	23	1.21	576	3.688	5.9	0.2632	4.8	0.81	3.7999	4.8	0.1016	3.4	1654	64	1569	47	1506	65	9
BC14-05 S 237	1	118	50	43	0.42	2548	4.391	6.7	0.2877	5.8	0.86	3.4753	5.8	0.1107	3.4	1810	62	1711	56	1630	83	10
BC14-05 S 241	1	128	54	46	0.42	1293	4.219	4.2	0.2842	3.8	0.91	3.5181	3.8	0.1076	1.8	1760	33	1678	35	1613	54	8
BC14-05 S 244	1	113	94	42	0.83	5529	3.961	5.0	0.2714	3.7	0.75	3.6851	3.7	0.1059	3.3	1729	60	1626	40	1548	51	10

BC14-05 S 245	1	132	84	48	0.64	14810	4.149	3.9	0.2816	3.1	0.80	3.5510	3.1	0.1069	2.3	1747	43	1664	32	1599	44	8
BC14-05 S 246	1	98	59	39	0.61	3080	4.416	6.4	0.3006	5.7	0.89	3.3271	5.7	0.1066	2.9	1741	52	1715	53	1694	85	3
BC14-05 S 247	1	189	174	71	0.92	3420	3.772	6.1	0.2659	5.0	0.82	3.7610	5.0	0.1029	3.5	1677	64	1587	49	1520	67	9
BC14-05 S 250	1	67	20	25	0.30	3368	4.476	7.7	0.3115	6.2	0.81	3.2099	6.2	0.1042	4.5	1700	84	1726	64	1748	95	-3
BC14-05 S 257	1	338	112	97	0.33	18746	3.028	5.5	0.2384	5.1	0.93	4.1943	5.1	0.0921	2.0	1470	38	1415	42	1378	63	6
BC14-05 S 259	1	211	198	90	0.94	4695	4.525	4.9	0.2917	4.4	0.90	3.4282	4.4	0.1125	2.2	1840	39	1736	41	1650	64	10
BC14-05 S 260	1	270	139	98	0.51	21578	4.179	6.7	0.2837	6.4	0.96	3.5253	6.4	0.1068	1.9	1746	36	1670	55	1610	91	8
BC14-05 S 262	1	73	39	28	0.53	1288	4.515	6.7	0.3028	5.8	0.87	3.3026	5.8	0.1081	3.2	1768	59	1734	55	1705	87	4
BC14-05 S 264	1	155	56	57	0.36	12489	4.570	6.2	0.2980	5.5	0.88	3.3559	5.5	0.1112	2.9	1819	53	1744	52	1681	81	8
BC14-05 S 266	1	342	95	119	0.28	74739	4.252	3.6	0.2863	3.3	0.93	3.4924	3.3	0.1077	1.4	1761	25	1684	29	1623	48	8
BC14-05 S 267	1	120	62	45	0.52	3042	4.309	8.4	0.2853	7.9	0.94	3.5050	7.9	0.1095	2.9	1792	53	1695	69	1618	113	10
BC14-05 S 270	1	233	96	86	0.41	10816	4.445	5.9	0.2941	5.6	0.94	3.3997	5.6	0.1096	2.0	1793	36	1721	49	1662	81	7
BC14-05 S 271	1	118	67	35	0.57	7772	2.952	4.9	0.2324	4.1	0.85	4.3033	4.1	0.0921	2.6	1470	49	1395	37	1347	50	8
BC14-05 S 274	1	61	22	25	0.36	1624	5.144	7.4	0.3377	6.3	0.85	2.9610	6.3	0.1105	3.8	1807	70	1843	63	1876	103	-4
BC14-05 S 276	1	237	150	69	0.64	4629	2.756	6.9	0.2232	5.8	0.85	4.4810	5.8	0.0896	3.6	1416	69	1344	51	1299	69	8
BC14-05 S 277	1	162	171	50	1.05	3651	2.494	7.5	0.2129	6.3	0.84	4.6978	6.3	0.0850	4.1	1315	80	1270	55	1244	71	5

BC14-05 S 278	1	193	119	69	0.62	8622	4.179	5.6	0.2823	5.1	0.90	3.5420	5.1	0.1074	2.5	1755	45	1670	46	1603	72	9
BC14-05 S 279	1	161	83	60	0.52	4000	4.231	7.3	0.2933	6.2	0.85	3.4098	6.2	0.1046	3.9	1708	72	1680	60	1658	91	3
BC14-05 S 281	2	76	47	28	0.62	2908	3.871	5.0	0.2846	4.4	0.89	3.5136	4.4	0.0986	2.2	1599	42	1608	40	1615	63	-1
BC14-05 S 283	2	70	25	24	0.35	642	4.298	7.5	0.2905	6.7	0.90	3.4418	6.7	0.1073	3.3	1754	60	1693	62	1644	98	6
BC14-05 S 284	2	136	45	51	0.33	6541	4.646	5.9	0.2988	5.0	0.86	3.3472	5.0	0.1128	3.0	1845	55	1758	49	1685	75	9
BC14-05 S 285	2	191	36	59	0.19	16110	3.719	5.2	0.2623	4.5	0.88	3.8129	4.5	0.1029	2.5	1676	46	1576	41	1501	61	10
>10% discordant																						
BC14-05 L 147	1	187	71	62	0.38	7730	4.137	6.3	0.2719	5.4	0.86	3.6784	5.4	0.1104	3.2	1805	58	1662	51	1550	75	14
BC14-05 L 152	1	172	65	60	0.38	4772	4.230	5.6	0.2799	5.2	0.93	3.5728	5.2	0.1096	2.0	1793	37	1680	46	1591	73	11
BC14-05 L 153	1	347	45	105	0.13	3153	3.868	5.8	0.2625	5.5	0.94	3.8088	5.5	0.1068	1.9	1746	35	1607	47	1503	74	14
BC14-05 L 168	1	232	105	80	0.45	15765	4.070	6.4	0.2737	5.7	0.89	3.6540	5.7	0.1079	3.0	1764	54	1648	52	1559	79	12
BC14-05 L 181	1	261	47	79	0.18	10318	3.822	6.2	0.2584	5.7	0.92	3.8697	5.7	0.1073	2.4	1754	44	1597	50	1482	75	16
BC14-05 L 182	1	119	69	43	0.58	16098	4.109	4.8	0.2725	4.2	0.87	3.6704	4.2	0.1094	2.4	1789	44	1656	39	1553	58	13
BC14-05 L 184	1	37	55	18	1.46	9761	4.779	10.7	0.3409	9.8	0.91	2.9331	9.8	0.1017	4.4	1655	81	1781	90	1891	161	-14
BC14-05 L 186	1	157	74	50	0.47	27	4.407	16.7	0.2551	10.5	0.63	3.9208	10.5	0.1253	12.9	2033	229	1714	138	1464	138	28
BC14-05 S 203	1	211	213	68	1.01	7844	2.956	5.2	0.2269	4.4	0.85	4.4075	4.4	0.0945	2.7	1518	51	1396	39	1318	53	13

BC14-05 S 207	1	156	147	66	0.94	518	5.022	5.9	0.2737	4.8	0.81	3.6532	4.8	0.1331	3.5	2139	61	1823	50	1560	66	27
BC14-05 S 208	1	298	64	95	0.22	3419	3.951	6.6	0.2688	5.1	0.78	3.7202	5.1	0.1066	4.1	1742	76	1624	53	1535	69	12
BC14-05 S 210	1	295	323	192	1.10	5271	11.170	10.7	0.4272	10.1	0.95	2.3408	10.1	0.1896	3.5	2739	57	2537	100	2293	195	16
BC14-05 S 211	1	123	74	26	0.61	884	1.875	6.6	0.1629	5.1	0.77	6.1385	5.1	0.0835	4.2	1280	82	1072	44	973	46	24
BC14-05 S 215	1	740	752	163	1.02	8673	1.857	6.6	0.1549	5.8	0.88	6.4556	5.8	0.0870	3.2	1359	61	1066	44	928	50	32
BC14-05 S 218	1	121	52	43	0.43	1781	4.151	5.2	0.2783	4.8	0.91	3.5933	4.8	0.1082	2.1	1769	39	1664	43	1583	67	11
BC14-05 S 228	1	237	219	73	0.92	1480	3.126	7.3	0.2183	6.0	0.83	4.5800	6.0	0.1038	4.1	1694	76	1439	56	1273	70	25
BC14-05 S 231	1	140	95	54	0.68	2052	4.187	3.8	0.2794	3.0	0.79	3.5790	3.0	0.1087	2.3	1778	43	1672	31	1588	42	11
BC14-05 S 238	1	755	239	178	0.32	3667	3.001	3.9	0.1927	3.8	0.97	5.1902	3.8	0.1130	0.9	1848	17	1408	29	1136	39	39
BC14-05 S 240	1	139	104	44	0.75	929	3.625	6.0	0.2460	5.4	0.90	4.0645	5.4	0.1069	2.6	1746	47	1555	48	1418	69	19
BC14-05 S 243	1	156	130	97	0.83	4882	11.025	4.9	0.4369	4.4	0.90	2.2887	4.4	0.1830	2.1	2680	35	2525	46	2337	87	13
BC14-05 S 248	1	235	106	82	0.45	3467	4.203	5.0	0.2785	3.5	0.70	3.5911	3.5	0.1095	3.6	1790	65	1675	41	1584	49	12
BC14-05 S 258	1	242	101	80	0.42	7226	4.053	5.8	0.2714	4.8	0.82	3.6844	4.8	0.1083	3.3	1771	60	1645	47	1548	66	13
BC14-05 S 261	1	457	264	160	0.58	4751	4.054	5.0	0.2611	4.7	0.94	3.8297	4.7	0.1126	1.7	1842	30	1645	41	1496	63	19
BC14-05 S 265	1	126	98	40	0.78	5238	2.898	4.6	0.2258	3.7	0.81	4.4280	3.7	0.0931	2.7	1490	51	1381	35	1313	44	12
BC14-05 S 280	1	121	24	36	0.20	5606	3.668	5.5	0.2508	3.8	0.69	3.9878	3.8	0.1061	4.0	1733	73	1564	44	1442	49	17

BC14-05 S 68	282 23	2	197	328	74	1.67	6414	2.975	6.7	0.2144	5.9	0.89	4.6651	5.9	0.1007	3.1	1636	57	1401	51	1252
BC14-05 S 57	286 11	2	104	78	38	0.75	2134	3.775	4.7	0.2635	4.3	0.91	3.7955	4.3	0.1039	2.0	1695	37	1587	38	1508

APPENDIX 1B:

BSU zircon LA-ICPMS notes

Isotope ratios and ages are reported without initial common Pb correction; gas blank-corrected mass 204 signals were generally irresolvable from zero.

Trace element concentrations in ppm, calculated using the mean count rate method, internal standardization to 29Si, and calibration to NIST 610 and 612 glass standards.

Ablation using a 213 nm wavelength laser, spot size of 25 microns, repetition rate of 10 Hz, and fluence of ~5 J/cm2.

Trace element concentrations were deleted from analyses known to have intersected inclusions of other minerals based on P and Ti.

14DS12

1

Zircon experiment 2 December 10, 2015

Isotope ratio and apparent age errors include systematic calibration errors of 0.48% (207Pb/206Pb), 0.98% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages NOT corrected using a measured linear secondary standard age bias - 206Pb count rate relationship above 40,000cps.

2

Zircon experiment 3 December 10, 2015

Isotope ratio and apparent age errors include systematic calibration errors of 0.47% (207Pb/206Pb), 1.48% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages NOT corrected using a measured linear secondary standard age bias - 206Pb count rate relationship above 30,000cps.

14RL011a

1

Zircon experiment 1 December 10, 2015

Isotope ratio and apparent age errors include systematic calibration errors of 0.49% (207Pb/206Pb), 1.08% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages NOT corrected using a measured linear secondary standard age bias - 206Pb count rate relationship above 30,000cps.

2

Zircon experiment 2 December 10, 2015

Isotope ratio and apparent age errors include systematic calibration errors of 0.48% (207Pb/206Pb), 0.98% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages NOT corrected using a measured linear secondary standard age bias - 206Pb count rate relationship above 40,000cps.

BC14-01

1

Zircon experiment 1 January 01, 2015

Isotope ratio and apparent age errors include systematic calibration errors of 1.08% (207Pb/206Pb), 2.78% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages NOT corrected using a measured linear secondary standard age bias - 206Pb count rate relationship above 10,000cps.

2

Zircon experiment 2 January 01, 2015

Isotope ratio and apparent age errors include systematic calibration errors of 1.01% (207Pb/206Pb), 2.25% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

BC14-02

1

Zircon experiment 3 January 01, 2015

Isotope ratio and apparent age errors include systematic calibration errors of 0.66% (207Pb/206Pb), 1.99% (206Pb/238U) (all 1-sigma).

Isotope ratios and ages NOT corrected using a measured linear secondary standard age bias - 206Pb count rate relationship above 14,000cps.

2

Zircon experiment 4 January 01, 2015

Isotope ratio and apparent age errors include systematic calibration errors of 0.717% (207Pb/206Pb), 1.95% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages NOT corrected using a measured linear secondary standard age bias - 206Pb count rate relationship above 14,000cps.

BC14-03

1

Zircon experiment 4 January 01, 2015

Isotope ratio and apparent age errors include systematic calibration errors of 0.71% (207Pb/206Pb), 1.95% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages NOT corrected using a measured linear secondary standard age bias - 206Pb count rate relationship above 14,000cps.

2

Zircon experiment 5 January 01, 2015

Isotope ratio and apparent age errors include systematic calibration errors of 0.75% (207Pb/206Pb), 1.92% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages NOT corrected using a measured linear secondary standard age bias - 206Pb count rate relationship above 14,000cps.

3

Zircon experiment 6 January 01, 2015

Isotope ratio and apparent age errors include systematic calibration errors of 0.65% (207Pb/206Pb), 2.48% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages NOT corrected using a measured linear secondary standard age bias - 206Pb count rate relationship above 13,000cps.

BC14-04

1

Zircon experiment 7 January 01, 2015

Isotope ratio and apparent age errors include systematic calibration errors of 1.36% (207Pb/206Pb), 3.53% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages NOT corrected using a measured linear secondary standard age bias - 206Pb count rate relationship above 12,000cps.

2

Zircon experiment 8 January 01, 2015

Isotope ratio and apparent age errors include systematic calibration errors of 0.373% (207Pb/206Pb), 4.70% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages NOT corrected using a measured linear secondary standard age bias - 206Pb count rate relationship above 12,000cps.

3

Zircon experiment 1 January 26, 2015

Isotope ratio and apparent age errors include systematic calibration errors of 0.55% (207Pb/206Pb), 2.37% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages NOT corrected using a measured linear secondary standard age bias - 206Pb count rate relationship above 14,000cps.

BC14-05

1

Zircon experiment 2 January 26, 2015

Isotope ratio and apparent age errors include systematic calibration errors of 0.73% (207Pb/206Pb), 1.71% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages NOT corrected using a measured linear secondary standard age bias - 206Pb count rate relationship above 16,000cps.

2

Zircon experiment 3 January 26, 2015

Isotope ratio and apparent age errors include systematic calibration errors of 0.68% (207Pb/206Pb), 2.03% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages NOT corrected using a measured linear secondary standard age bias - 206Pb count rate relationship above 17,000cps.

APPENDIX 1C:

BSU zircon LA-ICPMS concentrations

Analysis	P	Ti	Y	Nb	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	Th	U
14DS12																						
<10% discordant																						
14DS12 L 165	180	18.1	513	1.51		3.67	0.03	0.55	2.93	0.06	10.5	4.11	51.56	18.70	78.7	19.8	221	26.5	9133	0.88	30.6	71.1
14DS12 L 171	508	10.9	1205	0.88		4.60	0.01	1.73	3.81	0.13	24.9	9.13	117.57	43.74	190.0	47.8	511	59.0	9675	0.80	64.0	176.4
14DS12 L 172	93	24.5	669	0.38		1.56	0.21	4.76	9.75	1.66	31.3	9.53	90.71	26.73	94.8	21.0	213	24.1	6354	0.23	15.1	26.7
14DS12 L 175	151	7.7	549	5.33		6.83	0.05	1.50	3.86	0.78	15.0	4.90	62.58	21.11	84.5	20.3	214	25.4	7480	2.81	80.7	140.1
14DS12 L 176	246	12.8	736	3.05		30.40	0.05	1.17	3.21	0.55	18.1	6.01	73.27	26.58	117.9	30.5	302	37.0	9102	1.51	93.4	142.8
14DS12 L 177	256	5.0	767	1.65	0.01	7.17	0.15	2.04	3.93	0.27	19.3	6.89	78.95	28.70	115.8	28.5	289	35.0	9184	0.97	100.9	167.1
14DS12 L 179	201	8.9	1171	13.82	0.69	11.78	0.54	7.11	8.01	1.08	30.9	10.52	121.97	42.84	177.1	40.9	423	49.0	6620	5.36	142.7	222.3
14DS12 L 180	102	2.8	1058	34.92		9.78	0.06	1.18	3.60	0.26	22.4	8.08	109.11	39.56	165.2	41.6	429	48.3	10267	15.51	142.8	359.8
14DS12 L 182	178	11.9	1338	1.31	0.01	12.83	0.48	9.19	16.11	1.73	60.3	15.96	163.42	52.24	191.8	42.3	417	50.2	8368	0.67	149.0	171.3
14DS12 L 183	313	4.5	1735	1.22	0.22	15.79	1.04	16.71	20.36	1.77	76.0	19.50	203.16	63.28	242.6	51.8	481	59.1	8707	0.76	308.8	131.6
14DS12 L 185	143	8.8	578	2.26		8.68	0.02	0.80	1.69	0.11	8.7	3.79	51.97	19.40	87.7	23.2	240	30.7	11189	1.77	75.5	173.0
14DS12 L 190	110	4.8	692	4.40	0.07	8.05	0.24	4.29	5.22	2.36	22.7	6.93	75.50	24.21	101.0	24.5	260	30.6	6082	2.02	69.2	82.6

14DS12 L 191	79	4.4	94	0.25								0.14	3.38	2.45	23.2	10.5	185	33.5	9308	0.22	0.3	19.5
14DS12 L 192	207	15.8	1538	0.22		5.65	0.23	5.40	7.92	1.18	39.0	13.71	163.20	56.32	229.6	52.8	529	57.8	7484	0.09	128.0	210.7
14DS12 L 193	100	3.1	515	2.72		4.75	0.15	4.38	4.51	1.07	19.1	5.91	61.74	19.57	72.4	17.1	174	20.1	6416	1.72	45.5	83.3
14DS12 L 194	139	3.1	2817	22.18	0.15	29.00	1.36	23.02	36.85	4.98	119.4	36.33	355.61	101.80	371.8	81.4	790	81.9	6835	8.31	447.7	510.7
14DS12 L 196	328	11.3	856	3.08	0.03	7.30	0.07	1.49	4.10	0.27	20.5	7.27	92.13	30.91	135.9	33.1	356	38.7	9041	1.57	99.6	217.0
14DS12 L 197	500	3.8	714	11.80	18.59	37.47	4.50	16.57	5.80	0.63	18.2	6.33	76.97	26.26	107.9	27.6	295	32.7	7364	6.23	178.2	284.8
14DS12 L 200	191	24.0	1109	5.11	0.14	8.17	0.39	6.46	7.29	5.09	41.3	12.75	137.27	41.52	159.1	36.2	375	42.7	5573	3.05	131.5	116.8
14DS12 L 202	149	10.0	630	11.26		10.92	0.10	2.54	4.29	0.38	20.5	6.69	72.06	23.08	96.4	21.5	225	26.5	7511	4.48	75.8	133.8
14DS12 L 203	112	11.4	1150	7.41	0.05	11.49	0.68	11.34	12.24	2.18	40.5	12.67	140.46	43.95	169.8	39.9	410	44.1	5297	3.62	148.5	205.9
14DS12 L 205	185	7.1	595	7.69	0.19	11.47	0.10	2.02	3.05	0.53	14.0	5.09	57.84	21.07	88.9	22.9	244	28.0	7570	4.12	79.9	142.0
14DS12 L 206	163	7.8	1240	5.92	0.04	14.28	0.21	4.57	8.63	1.65	40.0	12.46	134.97	44.88	185.3	45.1	455	51.4	7880	3.61	144.8	195.5
14DS12 L 207	154	13.6	734	2.36	0.02	9.30	0.57	8.18	10.91	1.50	33.0	8.80	93.48	27.43	109.5	24.4	248	29.8	6705	1.54	54.4	64.0
14DS12 L 208	266	5.0	725	18.33	1.49	22.66	0.63	3.98	3.97	0.62	16.8	6.05	73.24	25.91	111.5	28.4	311	39.5	9125	9.37	143.9	260.2
14DS12 L 209	164	12.3	865	4.57		4.86	0.18	3.06	5.47	1.63	27.2	8.62	101.99	30.76	126.4	30.2	308	36.6	7422	2.69	63.9	101.9
14DS12 L 214	157	13.0	799	4.01		8.96	0.12	2.12	5.69	1.29	23.9	7.59	87.09	29.60	121.8	29.2	289	38.0	8103	2.12	75.1	92.3
14DS12 L 217	97	9.9	524	0.23		0.67		0.45	1.74	0.41	11.8	3.78	51.25	19.70	88.1	22.3	237	35.9	8294	0.09	9.3	31.2

14DS12 L 219	321	7.9	1454	2.52		6.07	0.01	0.62	3.85	0.19	25.0	10.32	137.35	53.30	235.0	55.1	530	76.6	12993	1.73	78.4	150.5
14DS12 L 220	126	21.8	1589	13.63	0.14	40.44	0.48	8.94	16.60	2.52	62.6	19.37	199.91	61.56	232.1	52.2	476	49.6	6553	5.72	141.0	163.3
14DS12 L 222	194	12.4	1016	4.21		10.71	0.28	4.14	7.87	1.69	34.6	10.51	113.36	37.62	150.5	36.3	368	43.7	7294	2.89	97.9	134.9
14DS12 L 223	174	10.2	404	0.74		11.28	0.03	1.52	2.98	0.93	13.2	4.17	43.41	13.35	59.2	15.0	166	19.4	7273	0.42	30.7	76.0
14DS12 L 225	145	5.6	1115	36.92		11.29	0.01	0.55	2.35	0.25	12.6	6.24	97.94	38.91	185.6	49.9	549	58.3	10918	17.30	106.9	367.4
14DS12 L 227	205	11.6	532	1.85		40.35	0.14	2.93	4.28	1.38	19.8	5.52	57.04	18.47	75.6	18.9	210	24.5	7764	1.13	204.9	216.5
14DS12 L 228	104	17.9	358	11.19	0.03	12.36	0.12	1.75	3.16	0.48	11.4	3.49	42.34	13.67	57.2	13.7	140	16.4	6290	3.58	78.8	119.1
14DS12 L 229	98	10.3	998	28.44		47.58	0.21	3.33	7.33	1.05	29.3	10.57	123.25	38.35	148.7	35.0	338	32.6	6492	10.89	222.3	274.7
14DS12 L 230	322	13.8	852	1.15		4.06	0.08	1.69	4.52	0.08	21.3	7.52	87.69	31.81	132.9	33.0	346	38.4	9733	0.62	105.3	150.0
14DS12 L 231	176	4.2	583	1.47	0.01	13.01	0.07	1.61	2.22	0.13	14.0	4.74	61.30	21.74	89.8	22.2	238	28.5	7699	0.60	111.3	98.7
14DS12 L 233	145	13.5	376	2.88		3.52	0.03	1.01	2.45	0.74	11.2	3.75	44.12	13.43	57.8	14.0	151	17.3	6928	1.69	35.5	66.4
14DS12 L 234	87	9.7	1031	4.76	0.07	8.82	0.74	8.57	12.46	0.69	44.5	11.90	139.49	41.22	158.9	36.9	348	37.0	5920	2.10	85.8	130.1
14DS12 L 236	123	7.2	610	8.53		8.52	0.09	2.16	3.51	0.17	18.0	6.05	66.11	21.66	91.9	22.3	245	27.1	7072	4.58	67.6	139.7
14DS12 L 237	224	6.5	671	10.45	12.82	23.29	1.59	10.06	4.03	0.86	15.3	6.55	75.44	26.24	104.9	25.4	274	31.4	8100	5.21	150.5	238.9
14DS12 L 241	118	18.2	330	0.60		1.72	0.03	0.91	1.77	0.34	9.2	3.22	36.02	12.76	53.3	12.8	142	17.4	6181	0.23	10.9	46.4
14DS12 L 242	165	24.4	295	0.89		0.84		0.20	0.75	0.03	4.3	1.90	26.60	9.16	47.8	13.5	160	20.6	8657	0.37	14.9	47.7

14DS12 L 243	265	14.4	764	1.01		15.78	0.03	1.48	3.23	0.69	19.0	6.11	79.98	28.97	119.0	28.8	298	33.8	8752	0.70	70.8	108.4
14DS12 L 244	275	15.1	873	2.98		30.22	0.06	1.58	4.36	0.86	21.2	7.74	93.34	31.69	137.3	34.4	367	42.7	9341	1.44	78.3	131.9
14DS12 L 245	213	11.3	570	6.05	2.09	12.29	0.53	3.92	4.28	0.52	18.0	5.58	66.84	21.21	90.1	21.5	235	27.6	7227	3.46	83.9	132.1
14DS12 L 247	243	7.9	1589	4.76	0.04	15.16	0.02	1.45	5.82	0.62	33.4	13.11	160.24	60.99	258.6	64.0	652	77.2	10132	2.41	110.4	306.3
14DS12 L 248	157	2.8	273	0.33		8.43	0.03	1.09	1.17	0.51	5.7	1.83	22.79	8.09	41.4	12.2	162	25.2	8332	0.16	43.4	109.7
14DS12 S 253	158	8.7	621	6.28		6.46	0.11	1.93	3.82	0.59	16.5	5.92	65.92	22.64	95.3	23.8	246	28.2	7058	3.97	86.6	160.2
14DS12 S 255	193	12.8	617	5.37		9.25	0.18	2.52	4.22	0.98	18.4	6.17	70.61	22.74	95.5	22.1	238	29.8	7964	3.36	99.4	114.8
14DS12 S 257	154	12.7	488	4.28	0.05	7.32	0.07	2.23	2.69	0.50	13.3	5.08	54.37	17.87	75.3	18.3	179	23.0	7160	2.43	70.9	108.8
14DS12 S 259	483	80.0	1206	2.21		6.13	0.05	1.26	4.65	0.57	26.4	9.27	119.72	45.02	190.4	49.5	529	66.5	10243	0.81	49.8	110.3
14DS12 S 261	102	10.2	406	4.56		9.83	0.08	2.62	3.87	0.13	16.3	4.53	49.22	15.50	60.0	15.2	146	19.1	7857	2.59	48.7	69.3
14DS12 S 265																						
14DS12 S 271	146	9.2	706	3.56		4.24	0.18	2.80	4.73	1.24	22.5	6.89	76.86	25.91	103.9	24.6	235	35.1	9069	2.85	48.7	70.3
14DS12 S 276	178	16.3	1359	3.08	0.09	8.18	0.88	11.94	16.79	3.92	53.8	16.59	156.95	51.70	193.3	41.2	359	58.1	8791	1.71	89.0	75.6
14DS12 S 279	153	13.3	526	3.69		6.44	0.08	1.97	2.61	0.69	15.5	4.86	54.58	19.53	82.0	18.5	175	25.5	9645	1.84	38.7	52.3
14DS12 S 280	260	9.7	1714	7.23	2.27	18.25	0.89	13.26	15.61	2.03	66.2	17.93	200.85	65.99	250.1	56.9	528	72.5	10123	3.42	214.7	167.5
14DS12 S 290	318	7.0	4135	67.08	0.12	104.68	0.92	16.48	29.95	3.11	139.2	44.92	494.61	161.14	611.0	133.7	1295	147.4	10369	20.35	505.4	491.2

14DS12 S 293	152	10.0	875	9.20		6.74	0.13	2.90	5.06	0.95	23.3	7.33	90.47	31.48	136.0	34.4	359	47.2	7365	4.83	73.7	156.6
14DS12 S 295																						
14DS12 S 296	74	4.7	420	0.18		8.97	0.02	1.35	2.23	0.86	11.1	3.15	37.12	12.67	54.8	14.4	161	24.0	7761	0.01	127.4	149.3
14DS12 S 297																						
14DS12 S 298	175	3.8	2675	36.50		28.06	0.38	7.49	14.34	0.95	83.9	27.42	317.15	105.22	396.3	82.7	689	89.9	9859	12.55	187.8	284.2
14DS12 S 302																						
14DS12 S 305	121	14.1	521	3.27		5.51	0.07	1.78	3.21	0.48	15.9	4.96	55.18	18.86	79.0	17.3	167	26.8	8773	1.75	55.2	68.1
14DS12 S 309	265	9.4	2123	2.08		23.02	0.33	5.54	9.65	2.64	46.7	16.53	186.72	71.35	311.5	74.9	776	117.6	10736	0.90	172.2	202.9
14DS12 S 310	133	5.7	422	3.51		4.46		0.26	0.83	0.02	8.4	2.71	37.60	14.85	68.1	16.1	167	25.2	11704	2.34	43.8	100.9
14DS12 S 312																						
14DS12 S 314	282	10.0	1113	1.13	0.49	11.41	0.17	3.76	5.45	0.81	28.4	8.82	103.60	38.41	165.7	40.5	424	56.8	9726	0.68	89.7	192.0
14DS12 S 315																						
14DS12 S 322	151	7.8	398	5.38	0.02	5.75	0.07	1.21	2.28	0.62	10.1	3.37	42.62	14.54	62.3	15.8	165	21.4	6868	2.80	41.3	72.9
14DS12 S 323																						
14DS12 S 325																						

>10% discordance

14DS12 L 161	139	13.6	936	2.70	0.05	5.57	0.28	6.83	10.64	2.55	36.5	11.42	120.85	36.38	137.9	30.9	311	34.2	6765	1.49	55.2	76.2
14DS12 L 163	140	12.2	756	6.16		5.77	0.15	2.57	4.72	1.04	18.6	6.29	81.92	27.50	117.4	28.5	307	36.0	6559	2.64	71.8	126.8

14DS12 L 164	1983	13.8	992	3.16	111.11	174.63	20.44	96.34	24.99	2.23	47.6	12.48	125.55	39.19	142.6	32.7	327	36.9	6845	1.71	85.5	112.3
14DS12 L 166	171	14.0	404	2.47		3.59	0.11	1.72	3.11	1.14	11.1	3.69	42.54	14.93	63.6	15.6	184	23.3	5764	1.71	30.5	58.1
14DS12 L 169	163	7.4	1564	5.37	11.11	22.61	1.71	13.14	13.83	1.86	51.7	16.67	191.22	61.61	230.0	53.8	537	59.0	7003	3.13	150.7	200.5
14DS12 L 170	129	10.7	1012	3.31	0.03	6.39	0.41	6.29	9.41	2.16	39.4	12.17	122.73	39.49	144.4	33.5	339	39.3	6774	1.68	57.6	80.6
14DS12 L 174	136	11.9	661	3.15		5.01	0.20	2.68	5.30	1.09	19.3	6.84	75.54	23.63	100.6	23.1	224	25.5	6929	1.93	56.4	87.4
14DS12 L 178	218	22.3	866	1.94	0.06	9.17	0.49	9.23	11.64	7.41	40.9	10.99	110.32	32.49	119.8	27.5	271	31.9	6483	1.14	38.9	39.2
14DS12 L 181	1150	14.7	1110	3.67	30.66	59.79	7.73	41.60	15.29	3.17	44.8	13.35	132.82	43.12	162.9	37.5	370	44.6	6723	1.88	77.8	107.8
14DS12 L 184	181	19.8	508	4.25	0.05	6.10	0.23	2.81	4.24	1.37	14.3	4.24	50.63	17.47	74.2	19.8	217	28.9	6593	3.10	34.8	60.9
14DS12 L 187	139	9.6	504	5.45		9.53	0.04	1.15	2.42	0.67	12.3	3.88	54.70	18.50	75.1	18.7	189	24.5	8608	3.38	51.9	83.9
14DS12 L 189	120	17.3	826	2.64	0.14	9.46	0.67	8.86	10.42	3.91	32.0	8.58	99.98	31.00	118.9	28.9	297	34.6	5878	1.62	82.4	85.2
14DS12 L 199	144	10.8	388	4.23	0.30	7.15	0.10	1.50	2.53	0.51	10.0	3.68	46.00	14.71	61.1	14.7	158	17.9	6955	2.38	44.3	76.7
14DS12 L 204	198	15.6	1015	3.16	0.08	12.37	0.68	9.68	13.09	6.34	41.2	12.80	127.91	38.10	145.9	33.6	345	40.6	5958	1.96	67.7	68.5
14DS12 L 211	526	13.1	1260	2.33	2.62	11.92	1.34	12.96	14.35	2.22	47.2	14.81	157.08	47.57	183.2	41.0	401	46.6	7279	1.65	87.5	105.7
14DS12 L 212	125	11.5	363	3.39		5.63	0.06	1.93	2.15	0.90	9.9	3.46	37.24	13.20	56.1	13.8	147	18.8	6855	1.89	26.8	41.6
14DS12 L 213	123	15.1	780	1.78	0.05	3.91	0.57	7.04	9.93	1.40	30.0	8.62	96.29	28.98	114.9	26.4	261	34.0	6333	1.15	47.2	69.1
14DS12 L 218	53	0.7	54	0.43	0.20	0.59	0.01				0.4	0.34	4.61	2.52	13.5	4.1	43	6.9	10546		7.3	7.4

14DS12 L 224	135	15.7	427	2.83		6.13	0.10	1.79	2.95	1.03	14.1	4.14	46.20	16.39	66.4	16.8	178	21.1	6637	1.66	35.1	50.2
14DS12 L 226	114	20.5	781	3.49	0.11	8.87	0.43	5.53	8.40	2.79	27.8	8.28	88.18	26.84	113.7	28.2	294	34.5	5767	2.32	83.0	102.6
14DS12 L 232	178	5.9	811	3.15	0.06	6.48	0.55	8.23	10.50	4.64	37.1	10.32	105.16	29.86	114.2	26.5	273	30.3	6547	1.77	69.1	93.2
14DS12 L 238	201	9.4	749	7.39	0.02	14.58	0.08	0.84	2.93	0.15	15.3	6.56	75.36	28.30	124.5	31.8	340	41.1	9608	2.82	79.2	155.9
14DS12 L 240	105	15.8	342	4.14	0.13	5.10	0.04	1.53	1.94	0.36	11.7	3.69	39.26	13.10	48.4	13.2	133	14.7	6569	2.23	38.5	74.6
14DS12 S 254	240	9.3	735	8.70	2.38	10.44	0.65	5.14	4.88	0.79	18.7	6.37	81.00	27.09	111.8	28.1	300	34.6	7552	4.52	59.7	135.5
14DS12 S 256	167	10.3	2688	18.19	0.85	45.37	2.53	42.43	52.56	2.78	143.3	39.70	380.09	110.99	398.7	86.1	805	93.9	6895	4.20	327.5	233.9
14DS12 S 258	196	15.8	534	4.20	0.00	8.03	0.12	1.12	3.35	0.67	15.2	5.13	58.80	19.15	80.6	19.6	197	25.2	7898	2.22	46.5	79.1
14DS12 S 262	159	12.0	549	4.90	0.08	8.10	0.11	1.78	3.64	0.74	17.7	5.27	59.36	20.74	84.3	20.0	206	26.6	7850	2.51	49.8	80.5
14DS12 S 263	140	10.7	933	9.82	0.05	9.93	0.21	3.48	6.27	0.51	27.9	8.69	106.60	35.47	144.8	34.4	340	42.5	7827	4.10	102.4	152.0
14DS12 S 266																						
14DS12 S 270																						
14DS12 S 272	211	19.9	1399	5.32	0.02	11.30	0.53	9.88	16.05	3.35	53.2	15.04	154.43	50.53	205.1	44.0	412	63.3	9474	2.85	120.2	90.2
14DS12 S 273																						
14DS12 S 275	158	11.1	742	4.16	0.02	5.75	0.09	2.36	4.36	0.91	21.9	6.51	79.03	26.19	113.9	24.8	237	35.2	9940	2.44	74.5	94.0
14DS12 S 277	112	17.3	1810	6.09	0.11	10.16	0.65	10.52	16.12	2.92	69.1	19.00	207.26	66.63	260.3	57.4	523	79.6	9063	3.46	178.1	153.9
14DS12 S 278	117	9.0	433	3.57		3.95	0.06	1.14	2.19	0.47	11.7	3.89	46.49	15.05	64.9	15.0	147	22.1	9388	2.17	40.2	59.8

14DS12 S 289	178	9.3	1157	9.35	0.06	10.10	0.31	5.68	8.15	1.33	39.4	12.73	134.54	44.69	179.4	39.8	409	48.5	7869	4.42	116.6	153.1
14DS12 S 291	180	16.2	704	7.28	0.28	14.78	0.16	2.31	3.57	1.04	19.1	6.23	72.32	25.46	106.0	26.5	270	35.5	7479	4.16	157.9	194.3
14DS12 S 292																						
14DS12 S 303	174	16.1	787	2.93	0.36	6.58	0.28	3.89	7.34	1.48	28.8	8.22	88.29	29.88	111.0	26.3	233	35.7	9293	1.68	42.1	47.5
14DS12 S 304																						
14DS12 S 307	156	19.9	339	1.95		5.39	0.06	1.38	2.71	0.74	11.4	3.20	36.48	12.18	48.4	11.0	106	18.0	8699	0.98	24.3	27.2
14DS12 S 311	143	6.6	1015	4.83		6.61	0.25	4.20	6.53	1.33	28.7	9.31	106.20	35.50	147.1	34.0	327	47.7	9501	3.73	103.2	138.8
14DS12 S 313																						
14DS12 S 316																						
14DS12 S 317	127	9.7	694	5.24		4.39	0.17	2.80	5.36	1.08	19.2	5.83	71.58	24.57	103.7	24.4	266	32.3	6548	2.54	55.5	99.3
14DS12 S 324																						

Analysis	**P**	**Ti**	**Y**	**Nb**	**La**	**Ce**	**Pr**	**Nd**	**Sm**	**Eu**	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**	**Hf**	**Ta**	**Th**	**U**
14RL011a																						
<10% discordant																						
14RL011a L 1	232	8.4	1090	2.65	0.04	51.92	0.19	2.84	10.28	5.01	50.6	13.29	129.70	39.08	159.8	38.9	401	46.7	8757	1.22	383.8	373.2
14RL011a L 2																						
14RL011a L 3	235	7.1	665	2.15		4.76	0.08	1.32	2.96	0.49	16.8	6.03	70.61	26.16	102.0	25.3	280	33.3	8451	0.74	10.3	15.9
14RL011a L 5																						
14RL011a L 8	196	16.5	1277	1.97	0.08	5.01	0.37	6.00	9.68	1.10	42.3	12.72	145.87	49.98	193.8	45.5	462	50.9	7755	1.14	73.0	112.0

14RL011a L 9136	17.8	180	0.19		0.16			0.40	0.22	3.9	1.38	18.95	6.77	30.7	7.8	92	12.3	7293	0.15	2.2	7.7	
14RL011a L 10	194	14.5	400	1.78		8.99	0.05	1.34	2.94	0.12	13.4	4.23	43.97	14.61	61.5	14.0	152	16.7	9848	1.15	84.7	111.3
14RL011a L 11	316	4.3	1392	9.49		19.10	0.05	2.82	6.97	0.08	35.4	12.45	153.19	56.27	231.7	54.6	538	63.9	11423	3.96	108.1	222.3
14RL011a L 12																						
14RL011a L 13	260	29.1	550	2.44	0.03	19.30	0.34	4.42	5.24	0.74	19.9	6.05	65.91	21.63	83.6	18.7	210	25.6	8570	0.98	31.5	34.2
14RL011a L 15	273	22.5	719	1.77		29.65	0.07	2.46	5.49	1.76	24.5	7.57	84.60	27.77	107.0	25.8	278	31.0	8299	0.86	39.5	49.9
14RL011a L 16	138	5.8	841	5.34		9.36	0.09	2.49	5.58	0.25	25.6	8.84	101.37	34.09	138.9	32.2	338	39.8	8288	2.22	20.0	37.3
14RL011a L 17																						
14RL011a L 18	207	10.4	903	0.93		7.39	0.06	1.74	3.29	0.30	19.8	7.30	87.18	33.00	147.3	34.3	372	44.1	9554	0.47	39.8	62.4
14RL011a L 24	138	8.5	474	0.46		3.01	0.24	5.44	6.82	1.50	23.8	5.91	56.41	18.17	67.0	15.6	161	21.1	6836	0.13	56.7	155.3
14RL011a L 27	307	10.1	1097	2.90		29.84	0.09	2.52	5.08	0.87	22.8	8.05	104.47	39.50	177.9	45.3	472	62.4	9780	1.62	101.4	94.2
14RL011a L 28	140	10.4	1028	0.32	0.01	11.32	0.63	9.62	12.80	4.29	41.3	10.69	107.41	37.71	155.8	39.2	401	55.0	6870	0.17	96.4	75.1
14RL011a L 29	147	24.4	372	1.23		1.65	0.03	0.70	2.29	0.49	11.7	3.79	42.53	14.72	56.8	13.4	135	17.8	8235	0.48	14.4	42.4
14RL011a L 30	197	7.0	955	4.56		13.44	0.05	2.28	4.76	0.20	24.5	7.61	98.97	35.15	151.6	37.7	367	48.5	10066	1.89	97.6	186.9
14RL011a L 32																						
14RL011a L 33	154	6.6	339	1.32		16.19	0.03	0.33	1.01	0.21	5.3	1.83	26.43	10.34	53.6	15.4	191	24.5	10098	1.23	84.8	198.9

14RL011a L 34	197	13.8	546	6.98	0.22	10.41	0.14	1.22	3.18	0.24	12.4	4.65	59.00	20.00	87.9	23.1	245	29.3	8897	4.21	91.1	164.5
14RL011a L 36	455	2.2	2329	7.10		30.43	0.20	3.52	10.75	2.58	56.8	20.08	245.35	89.01	372.4	84.9	847	92.4	7350	2.10	36.0	83.9
14RL011a L 37																						
14RL011a L 38	203	7.8	996	5.21		12.22	0.05	1.08	2.74	0.14	20.7	7.82	101.96	37.43	163.9	40.7	416	46.2	10342	2.60	81.0	202.5
14RL011a L 39																						
14RL011a L 40	204	4.8	505	1.93		3.84	0.06	1.31	5.60	1.24	25.7	7.13	69.01	17.92	61.6	13.0	111	11.5	10785	1.27	121.1	379.3
14RL011a L 42	203	45.1	231	0.09		1.54	0.07	1.52	3.09	1.07	12.1	2.92	30.45	9.33	34.7	8.5	91	12.3	6741	0.03	10.5	5.0
14RL011a L 43	204	9.6	674	3.91		7.68	0.03	0.72	1.74	0.17	12.6	4.61	66.16	24.81	111.9	27.2	294	35.2	9205	2.19	79.9	176.4
14RL011a L 44	366	19.0	1111	2.72		45.77	0.20	4.48	9.98	2.72	39.8	11.51	133.53	41.15	164.7	37.9	394	46.7	8461	1.02	88.7	106.3
14RL011a L 45	241	8.1	904	5.35		17.98	0.02	0.81	2.53	0.24	15.0	6.38	85.88	34.20	148.7	39.2	444	52.3	11987	2.88	125.1	296.5
14RL011a L 46	264	5.9	925	1.95		10.17	0.04	0.89	2.24	0.23	17.9	6.63	91.60	33.01	149.2	38.1	423	51.4	9987	1.31	72.7	150.6
14RL011a L 47	221	33.2	672	1.33	0.01	3.35	0.16	3.82	7.46	1.54	28.3	7.92	86.56	25.29	96.7	22.2	214	24.0	8532	0.66	14.4	21.9
14RL011a L 48																						
14RL011a L 49	164	7.5	502	3.37		16.53	0.03	0.44	1.00	0.27	7.9	3.69	43.20	17.62	84.1	25.0	301	37.6	11846	2.41	69.8	190.2
14RL011a L 52	206	11.3	676	2.33		7.74	0.03	1.20	1.96	0.16	15.3	5.26	61.58	24.43	108.9	27.9	312	39.2	9709	1.23	36.5	65.9
14RL011a L 54	150	6.6	627	1.01		6.26		0.89	2.02	1.59	17.0	5.25	61.27	22.26	92.0	23.3	251	30.7	7800	0.58	81.1	159.5

14RL011a L 55	229	3.8	653	0.92		15.62	0.03	0.92	3.65	0.62	14.4	4.57	58.72	22.46	102.9	28.2	311	41.0	8131	0.56	42.6	73.8
14RL011a L 56																						
14RL011a L 58	219	10.2	499	1.64		4.95	0.02	1.60	2.97	0.24	14.3	4.63	54.35	18.83	76.3	19.0	202	24.2	8285	0.34	72.5	88.2
14RL011a L 59	191	11.5	513	1.27		7.39	0.04	0.62	2.05	0.03	11.2	4.17	55.29	19.12	82.0	20.7	215	26.1	11437	0.68	35.6	74.6
14RL011a L 60	194	20.1	1235	2.40	0.15	10.09	1.09	16.66	22.28	2.06	73.8	17.91	168.90	47.92	170.5	35.1	328	36.3	7553	1.10	84.8	96.3
14RL011a L 61	145	20.3	338	1.12		29.15	0.16	2.11	3.89	0.69	11.4	3.03	35.12	11.27	48.1	12.2	139	17.3	8829	0.50	88.1	86.5
14RL011a L 63	185	5.7	1156	2.44		15.84	0.17	2.72	8.28	1.21	36.6	10.75	123.56	44.18	192.5	46.4	500	64.8	9615	0.97	89.5	171.9
14RL011a L 66	327	6.8	2583	3.13	0.07	23.42	0.52	8.09	16.20	4.90	80.2	24.47	277.79	94.39	393.6	93.9	977	126.0	7543	1.30	122.2	92.5
14RL011a L 67	126	20.6	474	0.24		0.24	0.02	1.09	1.48	0.91	13.4	4.66	50.97	17.08	72.2	17.8	190	24.7	7595	0.32	7.6	17.4
14RL011a L 68	207	25.9	524	2.30		17.62	0.07	1.68	3.10	0.54	17.0	5.48	61.18	19.98	79.7	18.6	198	24.4	9560	1.04	30.1	28.7
14RL011a L 69	156	12.1	773	0.62		25.27	0.22	5.27	9.33	2.09	34.5	8.77	87.05	26.77	103.1	25.2	253	33.5	8894	0.52	297.6	229.4
14RL011a L 71	216	19.0	813	1.93		7.87	0.03	0.91	3.62	0.24	15.3	5.87	79.95	28.99	128.8	31.8	331	44.1	10779	0.87	32.3	60.1
14RL011a L 72																						
14RL011a L 73	191	2.6	548	1.62		3.90		0.61	1.75	0.20	11.6	4.28	50.57	20.64	87.3	21.5	217	31.2	10853	1.02	53.6	126.0
14RL011a L 74	315	15.0	970	2.90	0.10	27.18	0.10	1.18	4.55	0.88	20.6	8.05	103.14	35.69	158.7	38.5	412	48.6	9820	1.55	67.3	114.6
14RL011a L 75	150	13.1	931	5.17	0.01	10.63	0.11	3.04	5.61	0.47	27.5	9.14	98.92	34.86	147.3	34.4	363	42.0	9218	3.34	129.0	196.4

14RL011a L 76	383	9.1	1027	1.21	0.01	14.96	0.06	2.76	6.55	2.22	28.6	9.49	114.51	37.25	152.2	37.1	383	45.9	8700	0.56	26.8	58.9
14RL011a L 77	108	25.0	233	2.61		35.29	0.05	0.70	1.19	0.39	5.7	1.82	21.79	7.65	37.1	9.9	128	16.5	8234	1.08	42.2	57.6
14RL011a L 79	1257	39.0	3974	0.95	0.01	7.11	0.28	7.32	22.49	4.07	122.9	42.12	452.30	152.37	547.7	111.9	1048	108.9	9844	0.61	94.8	104.4
14RL011a L 82	149	13.3	482	5.64		6.49	0.08	0.72	2.05	0.17	14.3	4.57	50.62	18.82	74.8	18.6	202	22.8	8196	2.86	56.2	98.9
14RL011a L 84																						
14RL011a L 85	148	14.4	802	3.09		6.26	0.07	3.17	5.56	0.45	27.3	8.36	95.18	31.39	128.0	30.5	314	36.5	7782	1.32	20.4	42.9
14RL011a L 86	141	6.5	896	4.90		12.22	0.08	2.82	6.49	0.39	29.4	10.10	108.85	36.40	143.6	32.3	316	36.7	6724	1.96	32.2	68.5
14RL011a L 87	258	29.9	1661	1.08	0.05	26.75	0.47	8.99	15.08	3.13	57.0	17.43	196.65	64.11	252.9	59.2	594	73.2	8044	0.61	58.6	55.3
14RL011a L 88	290	17.3	869	4.18	0.81	25.63	0.27	2.10	3.57	0.50	16.5	6.52	86.92	30.63	149.0	37.2	418	53.3	9764	2.03	79.5	111.0
14RL011a L 89	164	10.3	601	5.41		9.28	0.05	0.90	2.26	0.37	14.1	5.11	65.65	23.41	100.5	23.3	250	29.8	9782	2.70	79.5	240.0
14RL011a L 91	337	16.2	785	3.55	2.38	17.66	0.93	5.64	4.63	0.94	18.6	6.67	79.00	29.35	126.0	30.8	324	42.2	9874	1.55	28.0	70.7
14RL011a L 93	181	6.9	812	7.15		17.04	0.04	1.12	2.12	0.33	16.5	5.81	75.10	27.64	131.3	33.5	377	49.5	11301	3.96	44.3	142.6
14RL011a L 94	102	18.7	391	3.54		4.89	0.10	1.47	3.56	0.34	12.6	4.32	45.15	15.07	63.5	13.8	139	18.5	7912	2.22	38.0	63.8
14RL011a L 98	220	13.6	1361	1.47	0.02	33.67	0.32	5.20	9.62	2.21	46.9	14.06	150.09	50.28	204.6	47.1	464	60.0	10136	0.69	230.0	102.1
14RL011a L 99	200	16.2	954	1.35		4.99	0.09	2.09	4.79	0.48	26.9	8.37	103.21	35.13	141.8	31.8	317	40.2	10289	0.66	52.8	101.8
14RL011a L 100	301	20.2	1480	1.87	0.10	12.01	0.58	10.40	20.46	3.79	68.7	20.02	190.78	58.50	214.7	43.9	409	50.6	9360	0.99	52.6	67.3

14RL011a L 101	349	5.4	1627	2.33	0.03	15.84	0.35	6.40	9.45	1.22	43.4	14.69	171.52	58.91	256.4	56.1	585	79.6	11862	1.28	79.6	92.4
14RL011a L 102	166	3.8	1375	2.41		8.21	0.04	0.98	2.98	0.16	23.6	8.82	120.67	47.25	222.4	52.8	509	75.8	14053	1.20	86.4	225.0
14RL011a L 103	287	11.1	1330	1.20		8.57	0.08	2.26	5.59	0.87	28.6	10.85	143.72	51.27	213.1	52.4	569	62.2	9420	0.51	66.1	113.4
14RL011a L 105	206	5.8	1498	14.81	0.02	26.64	0.13	4.02	9.53	1.30	44.1	15.52	185.27	62.68	241.8	51.7	478	45.3	7090	5.31	96.0	148.1
14RL011a L 106	198	10.6	459	2.61		3.49	0.04	0.65	2.51	0.19	11.2	3.64	46.81	16.98	73.3	18.7	207	24.0	9243	1.28	13.2	32.8
14RL011a S 107	239	28.5	816	1.71	0.02	30.81	0.36	6.87	10.80	2.82	32.1	8.84	93.22	31.32	120.9	28.4	314	36.8	7253	0.82	64.1	56.2
14RL011a S 108	186	8.3	709	8.79		12.04	0.05	0.93	3.19	0.14	18.7	6.09	72.92	26.77	115.7	26.8	289	35.1	9796	4.83	121.7	209.6
14RL011a S 109	141	4.7	651	2.55		21.05	0.03	1.34	2.16	0.60	14.4	5.05	61.40	22.31	101.8	25.9	281	36.3	9576	1.20	127.3	312.6
14RL011a S 110	404	21.8	1778	3.66		48.00	0.16	4.77	9.00	1.71	42.1	15.20	177.93	65.52	290.2	70.2	735	96.4	8721	1.45	145.7	143.2
14RL011a S 111	211	4.7	616	1.65		7.31	0.15	2.48	5.08	0.50	20.7	6.67	69.82	23.66	99.8	24.0	229	31.3	9099	0.58	23.5	28.7
14RL011a S 112	317	8.9	1002	4.63		23.06	0.02	0.90	3.54	0.28	16.8	6.50	87.00	33.50	157.4	39.2	424	60.2	12938	2.72	101.0	141.0
14RL011a S 114	202	4.1	796	1.27		7.19		0.93	2.39	0.22	17.3	5.92	71.31	28.13	125.6	32.8	323	52.1	11669	0.84	63.5	134.9
14RL011a S 115	164	6.5	807	4.11		42.07	0.07	0.86	2.18	0.67	15.3	5.13	68.25	25.45	125.6	31.8	363	59.2	12534	2.26	186.6	267.3
14RL011a S 116	300	25.9	1044	2.09		10.80	0.06	1.61	3.45	0.48	23.1	8.02	99.12	36.22	164.8	38.1	370	59.6	13169	1.18	70.4	73.6
14RL011a S 117	232	8.9	2272	2.87	0.06	7.71	0.26	4.62	9.19	0.63	58.9	19.12	229.20	85.26	345.9	73.0	655	101.2	12792	1.76	114.2	173.8
14RL011a S 118	155	18.9	547	1.25		3.00	0.05	0.65	1.95	0.57	11.4	4.94	56.27	20.29	86.3	21.4	234	25.6	7723	0.73	13.7	35.4

14RL011a S 119	304	27.5	1172	0.90		4.60	0.19	2.92	8.67	1.77	34.9	11.87	137.72	46.31	178.6	42.6	457	49.8	8580	0.51	24.4	30.5
14RL011a S 120	108	56.0	578	3.36	0.24	6.04	0.85	8.56	9.24	2.84	25.0	7.68	76.17	22.88	89.9	21.3	235	26.9	6847	1.87	168.4	131.8
14RL011a S 121	114	3.8	1172	52.72		15.37	0.05	0.66	3.07	0.12	15.1	7.18	102.48	39.71	190.1	51.5	550	62.2	11449	16.97	102.7	316.2
14RL011a S 125	248	14.2	696	1.63		23.07	0.04	0.93	3.01	0.79	16.8	6.04	71.55	25.10	109.1	28.8	319	38.3	9651	1.06	62.9	113.9
14RL011a S 126	374	13.1	1392	6.40		65.12	0.07	2.86	8.03	1.45	38.9	12.65	156.36	51.45	212.9	50.2	514	60.6	9759	2.45	89.9	139.7
14RL011a S 127	119	13.0	1339	2.12	0.09	4.63	0.59	11.74	17.51	1.80	70.1	17.51	174.49	53.73	190.8	41.4	396	44.7	7125	1.18	52.1	89.4
14RL011a S 128	241	23.9	556	1.04		3.93	0.08	1.97	4.07	0.31	18.4	5.44	65.54	20.28	78.9	18.8	186	21.3	9045	0.49	34.4	57.7
14RL011a S 129	106	8.5	330	2.84	0.01	21.87	0.06	0.66	1.98	0.26	6.1	2.29	26.43	10.19	50.5	13.9	175	25.7	10154	1.09	195.8	397.5
14RL011a S 131																						
14RL011a S 137	251	9.1	1059	6.07		42.79	0.07	1.75	3.31	1.01	21.8	7.88	103.31	39.51	171.7	45.0	457	60.8	9046	2.65	75.0	139.7
14RL011a S 138	135	11.5	517	7.84		9.01	0.05	0.84	1.90	0.18	8.7	3.90	49.28	17.58	80.3	19.4	207	25.7	8489	4.62	82.2	155.3
14RL011a S 139	189	12.0	622	2.83		14.66	0.01	1.33	2.32	0.23	13.8	5.10	63.61	22.31	95.2	23.6	243	31.5	10052	1.56	69.3	237.3
14RL011a S 140	149	10.6	526	0.77	0.01	4.72	0.10	3.13	5.64	1.50	24.3	6.41	57.44	18.37	71.3	17.0	167	22.7	10367	0.45	159.2	306.9
14RL011a S 141	221	23.4	753	1.62	0.69	39.50	0.60	8.61	10.89	3.51	38.7	9.38	88.68	27.66	105.6	21.8	203	27.3	8717	0.62	45.2	25.6
14RL011a S 142	245	14.5	1023	3.84		5.74	0.06	1.76	3.12	0.09	22.0	8.02	101.73	37.69	159.1	36.5	360	51.4	11210	1.87	81.7	148.0
14RL011a S 143	137	9.8	502	3.06		8.34	0.08	0.80	1.60	0.20	10.3	3.86	48.17	17.91	78.9	20.2	205	31.2	12355	1.56	103.8	258.4

14RL011a S 144	205	18.6	701	1.76		4.91	0.04	1.07	3.11	0.48	13.2	5.63	69.21	24.85	108.6	25.2	259	36.8	11070	0.81	32.7	51.4
14RL011a S 145																						
14RL011a S 146	227	15.8	812	2.12		7.68	0.04	1.66	2.69	0.28	17.6	6.35	80.45	29.58	129.5	30.5	291	46.4	11942	0.99	38.2	59.4
14RL011a S 147	128	8.3	505	3.35	0.02	18.86	0.07	1.92	3.30	0.22	16.2	5.04	57.87	18.89	74.2	16.3	154	22.5	11926	1.51	171.7	167.9
14RL011a S 148	252	11.8	903	1.94		6.17	0.02	1.30	2.82	0.13	17.5	6.58	85.02	31.69	146.2	33.4	325	48.7	12423	1.13	53.9	98.0
14RL011a S 149	402	21.4	1986	2.66	0.02	22.26	0.22	4.50	9.89	1.39	49.6	16.71	202.28	71.92	307.4	72.3	702	102.0	12104	2.01	166.0	166.2
14RL011a S 153	173	8.3	904	0.63		13.02	0.14	3.46	5.03	1.90	22.2	6.87	81.49	30.43	138.4	34.4	370	57.8	9847	0.47	136.2	118.7
14RL011a S 154	215	3.9	1063	5.18		11.88	0.07	1.69	4.44	0.15	24.1	8.59	106.96	38.37	166.6	40.8	401	52.7	10253	2.30	94.7	180.6
14RL011a S 155	252	11.8	903	1.94		6.17	0.02	1.30	2.82	0.13	17.5	6.58	85.02	31.69	146.2	33.4	325	48.7	12423	1.13	53.9	98.0
14RL011a S 156	402	21.4	1986	2.66	0.02	22.26	0.22	4.50	9.89	1.39	49.6	16.71	202.28	71.92	307.4	72.3	702	102.0	12104	2.01	166.0	166.2
14RL011a S 157	173	8.3	904	0.63		13.02	0.14	3.46	5.03	1.90	22.2	6.87	81.49	30.43	138.4	34.4	370	57.8	9847	0.47	136.2	118.7
14RL011a S 160	215	3.9	1063	5.18		11.88	0.07	1.69	4.44	0.15	24.1	8.59	106.96	38.37	166.6	40.8	401	52.7	10253	2.30	94.7	180.6
>10% discordant																						
14RL011a L 22	632	4.5	2917	6.51	0.10	66.91	0.80	16.19	26.60	4.61	105.9	30.46	342.26	115.02	457.8	107.8	1086	131.3	8775	2.64	67.2	34.3
14RL011a L 41	187	4.9	2139	11.58	0.04	13.96	0.22	3.43	11.11	2.01	60.0	22.32	263.41	89.53	344.8	77.8	730	73.9	6885	3.95	93.9	239.0
14RL011a L 53	176	9.1	491	2.90		27.13	0.04	0.46	2.56	1.07	14.1	4.42	56.58	18.52	78.2	18.4	202	22.9	10302	1.55	134.3	167.6

14RL011a L 62	176	7.5	1136	0.62		5.02	0.10	2.51	5.47	1.61	29.7	9.13	119.77	43.07	183.4	43.1	493	62.9	7733	0.53	54.6	140.2
14RL011a L 64	390	16.9	1372	2.97	0.07	70.62	0.57	8.84	17.36	6.98	68.4	17.14	164.54	49.69	193.6	45.1	480	58.1	8606	1.27	402.6	315.5
14RL011a S 113	287	22.7	876	2.28		12.82	0.14	2.68	4.22	0.40	20.8	7.54	90.99	32.57	136.0	34.7	368	47.7	9587	0.85	59.1	82.7

Analysis	**P**	**Ti**	**Y**	**Nb**	**La**	**Ce**	**Pr**	**Nd**	**Sm**	**Eu**	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**	**Hf**	**Ta**	**Th**	**U**
BC14-01																						
<10% discordant																						
BC14-01 L 2																						
BC14-01 L 3	288	15.0	780	1.54		8.67	0.10	2.28	3.84	1.00	21.9	6.29	80.65	25.68	116.9	30.7	273	43.2	8885	0.55	16.6	38.8
BC14-01 L 4																						
BC14-01 L 5	273	24.6	727	0.69		2.66	0.22	2.73	5.88	0.40	27.9	8.75	90.78	29.21	102.2	22.5	204	29.6	8486	0.18	22.2	42.7
BC14-01 L 6	294	27.6	938	0.99	0.04	3.37	0.21	5.80	8.53	0.39	38.8	10.00	112.30	35.57	135.7	28.0	237	34.9	8798	0.42	26.9	48.0
BC14-01 L 7																						
BC14-01 L 10	656	11.2	1404	1.82		14.69	0.05	1.62	3.68	0.91	26.4	10.34	133.96	51.66	243.4	62.0	644	96.4	9456	0.58	38.7	90.3
BC14-01 L 13	267	2.2	627	0.81		2.49	0.06	0.42	2.56		13.4	4.64	57.27	21.56	103.1	23.6	252	34.7	10207	0.59	44.5	158.2
BC14-01 L 14	322	9.1	831	0.84		2.66	0.05	1.56	2.49	0.07	17.9	7.17	85.13	30.45	131.3	31.3	313	39.8	9067	0.68	55.4	160.3
BC14-01 L 25	194	6.4	550	0.86		7.22	0.15	1.39	3.03	0.35	14.0	5.04	58.35	21.78	87.5	19.8	210	28.2	6885	0.28	27.0	68.7
BC14-01 L 28	228	16.1	569	1.27		7.71	0.04	1.88	2.91	0.39	14.6	4.46	60.45	21.21	86.8	20.6	211	30.8	7958	0.51	27.5	52.3

BC14-01 L 37	346	43.7	969	0.42		12.20	0.12	3.50	7.26	3.36	30.2	9.64	104.17	33.56	143.0	31.0	298	42.3	7662	0.37	13.3	12.8
BC14-01 L 39	205	12.8	823	3.31		6.61	0.07	1.97	3.08		22.8	7.40	92.69	31.02	124.6	26.2	241	34.2	9889	2.12	69.1	139.5
BC14-01 L 40																						
BC14-01 L 44	259	15.7	953	5.47		63.84	0.13	2.78	7.03	0.57	26.5	8.92	99.47	35.79	156.8	37.2	417	56.7	8587	1.94	81.8	122.4
BC14-01 L 46																						
BC14-01 L 47																						
BC14-01 L 52	152	7.4	675	4.26		46.99		1.05	3.09	0.50	15.0	5.00	67.47	24.88	117.8	28.2	320	45.4	10534	2.24	187.1	322.5
BC14-01 L 54																						
BC14-01 L 55																						
BC14-01 L 57	316	11.4	981	4.20		32.68	0.09	2.12	4.79	0.67	22.2	9.14	105.26	38.30	169.8	39.4	403	57.4	9232	1.41	34.4	53.7
BC14-01 L 59	232	7.3	1760	4.02		9.35	0.11	4.34	11.57	0.40	53.1	18.29	200.93	73.06	288.7	65.2	579	77.9	9208	1.95	58.3	137.1
BC14-01 L 61																						
BC14-01 L 62	130	12.5	469	1.04		3.46	0.03	1.56	2.29	0.19	13.1	4.34	53.91	18.36	76.4	17.0	161	22.8	9728	0.38	19.0	64.8
BC14-01 L 63	125	11.5	352	0.99		3.64		0.77	1.41	0.07	10.3	3.53	38.10	14.49	60.3	13.5	138	19.3	10149	0.66	17.5	76.1
BC14-01 L 64	223	13.0	770	0.89		3.80	0.02	1.29	2.94	0.44	22.3	6.51	77.52	29.09	124.9	27.9	258	42.0	8763	0.50	24.9	65.4
BC14-01 L 69																						
BC14-01 L 72																						
BC14-01 L 73																						
BC14-01 L 74																						
BC14-01 L 75	244	5.9	1325	3.25	0.05	24.01	0.13	3.41	6.17	0.96	34.3	12.18	140.43	52.56	219.0	50.5	512	70.3	10015	1.40	49.8	96.0
BC14-01 L 76	285	8.2	1221	5.93		14.93	0.09	2.07	4.18	0.31	29.4	10.39	126.45	48.23	205.4	48.4	469	63.5	8988	2.51	59.3	116.5

BC14-01 L 79	187	13.0	650	0.89		7.60	0.08	0.88	2.82	0.50	15.9	5.66	69.03	23.74	110.5	24.9	238	38.7	9266	0.47	47.5	87.2
BC14-01 L 81																						
BC14-01 L 83																						
BC14-01 L 86																						
BC14-01 L 87	253	5.8	655	1.06		3.37		0.53	1.65	0.15	13.9	4.73	63.01	24.41	103.7	24.6	245	34.0	9049	0.37	33.1	131.8
BC14-01 L 89	133	16.8	443	1.92	0.04	3.95	0.01	0.73	1.76	0.17	9.9	4.55	46.92	16.03	71.9	16.1	164	23.2	9297	0.68	39.7	68.2
BC14-01 L 92																						
BC14-01 L 93	322	9.5	865	1.96		10.33	0.10	1.89	3.38	0.05	22.7	6.92	83.36	34.03	139.0	32.5	316	43.3	9468	1.21	115.4	213.3
BC14-01 L 96																						
BC14-01 L 101	236	8.1	833	5.19		10.38	0.07	0.87	2.92	0.05	17.8	6.24	84.90	32.62	137.4	33.2	330	46.9	9160	2.42	31.0	82.4
BC14-01 L 102																						
BC14-01 S 108																						
BC14-01 S 111																						
BC14-01 S 112																						
BC14-01 S 120																						
BC14-01 S 121	191	18.5	596	2.03		46.45	0.06	3.68	4.92	0.88	18.7	5.65	58.46	21.78	91.5	20.5	187	31.3	8504	0.63	37.2	50.1
BC14-01 S 122	293	5.6	1766	6.08	0.00	10.53	0.08	2.38	5.85	1.42	41.6	14.36	172.18	67.93	282.3	59.6	508	85.6	9768	2.15	127.7	105.8
BC14-01 S 123																						

BC14-01 S 126																					
BC14-01 S 127	324	16.6	1156	5.40		44.38	0.12	2.08	4.65	1.13	25.4	8.54	109.57	40.16	176.7	37.8	354	62.4	11000	1.91	58.2	51.9
BC14-01 S 131	225	3.5	1036	2.01		13.39	0.02	1.18	3.33	0.27	19.5	7.46	89.02	34.85	158.5	35.1	311	57.2	7950	0.72	56.9	101.3
BC14-01 S 133	209	5.1	915	3.61		8.33	0.00	0.89	2.32	0.09	19.1	6.42	76.09	31.86	141.3	31.7	284	52.4	11170	1.72	41.3	90.4
BC14-01 S 135	305	19.9	1037	1.68		33.89	0.12	2.50	6.23	1.85	22.5	8.42	100.63	34.91	153.7	32.3	297	56.1	9282	0.48	74.7	64.8
BC14-01 S 143																					
BC14-01 S 144	356	9.9	1445	4.27	0.02	7.14	0.07	3.01	7.23	0.82	41.9	13.07	156.62	52.52	221.9	46.0	443	61.9	7279	1.54	62.2	83.8
BC14-01 S 146	218	14.4	517	0.76		4.48	0.02	0.88	1.55	0.10	9.6	3.16	47.03	17.42	77.4	18.2	185	27.9	8104	0.25	22.5	60.3
BC14-01 S 149	331	8.4	1252	3.15		21.79	0.13	2.26	5.27	1.28	25.7	9.22	103.83	40.78	189.5	44.8	454	73.6	8731	1.24	155.9	218.8
BC14-01 S 151	159	5.7	694	2.10		10.92	0.05	0.92	3.09	0.03	15.1	5.27	61.10	24.79	100.3	21.9	199	32.1	10487	1.12	116.0	331.5
BC14-01 S 153	255	7.6	1456	1.96	0.85	10.56	0.75	7.02	10.83	0.93	53.8	14.71	159.33	55.47	203.4	39.5	321	52.1	10739	1.12	96.1	114.3
BC14-01 S 160	255	12.9	872	2.73					1.40	0.21	17.3	6.59	82.51	30.32	127.1	25.2	208	39.2	10475	1.15	66.1	94.3
BC14-01 S 165																					
BC14-01 S 167	285	5.9	1265	2.58		13.00	0.10	1.98	5.07	0.69	25.1	9.78	116.92	45.91	208.4	45.6	425	76.2	10939	1.17	129.6	200.9
BC14-01 S 170	168	3.6	1087	15.98		13.93		1.22	3.66		17.5	8.13	99.17	38.25	181.6	40.8	402	55.9	9392	5.47	83.9	326.6
BC14-01 S 171																					

BC14-01 S 173	211	7.9	573	0.97		8.16	0.05	0.36	1.80	0.34	12.2	4.03	54.39	20.45	92.4	21.0	205	32.9	8554	0.30	42.8	122.9
BC14-01 S 174	258	24.7	1394	0.17	0.15	2.25	0.26	5.42	9.20	3.85	48.5	14.10	156.84	52.52	216.2	47.0	446	68.2	6337	0.17	34.2	54.4
BC14-01 S 176	275	12.5	892	6.23	1.30	12.54	0.64	4.74	4.27	0.24	25.9	8.38	92.79	34.50	144.9	29.7	276	40.5	10900	2.94	66.7	173.7
BC14-01 S 177																						
BC14-01 S 178	288	21.4	1403	1.15	0.01	25.78	0.44	6.29	11.92	3.31	44.1	15.00	159.29	55.10	218.2	45.0	430	67.0	8935	0.65	36.1	29.7
BC14-01 S 180	140	12.0	414	0.94		21.68	0.05	0.71	3.91	0.38	9.8	3.12	39.53	15.85	71.4	17.7	175	27.0	10226	0.43	45.6	105.5
BC14-01 S 181	238	17.9	718	1.68		3.91	0.01	1.70	4.33	0.22	19.3	6.78	78.57	25.56	108.5	22.5	201	30.5	10921	0.83	33.9	71.2
BC14-01 S 183																						
BC14-01 S 184	290	11.6	992	2.87		6.46	0.07	1.29	5.53	0.45	27.2	8.54	99.53	37.45	153.8	34.2	302	54.2	11571	0.99	38.4	84.4
BC14-01 S 186	335	5.9	1511	4.22	0.03	21.50	0.06	1.80	4.16	0.55	28.5	10.60	141.75	52.80	249.2	54.0	549	98.3	11763	2.47	211.1	478.7
BC14-01 S 188	227	5.6	1058	2.14	0.01	7.56	0.03	0.95	2.17	0.19	19.1	7.06	94.44	34.76	176.5	37.0	327	64.6	12673	1.10	47.0	132.9
BC14-01 S 191																						
BC14-01 S 194	300	4.8	1165	2.04		15.73	0.00	1.41	3.80	0.48	23.4	8.47	100.59	38.74	184.3	41.5	402	79.5	12712	1.24	87.3	189.2
BC14-01 S 195	292	6.3	1079	4.56		19.84	0.06	1.05	2.06	0.26	16.8	6.72	92.77	36.21	171.8	43.2	384	78.3	13803	2.28	86.0	239.2
BC14-01 S 196																						
BC14-01 S 197	237	6.4	1220	2.63	0.00	9.55	0.08	1.84	4.22	0.46	23.0	9.67	117.22	43.97	196.8	41.0	357	59.9	10104	1.18	44.5	91.8

BC14-01 S 198																						
BC14-01 S 199	331	4.3	1390	2.67		19.64	0.02	1.18	4.27	0.33	23.4	9.28	120.13	49.26	229.4	52.8	481	85.8	13111	1.22	116.6	208.3
BC14-01 S 202	262	5.7	2143	9.16	0.03	40.24	0.15	3.06	7.17	1.58	49.2	17.85	230.45	85.26	363.5	75.9	634	94.6	8631	2.51	144.7	211.8
BC14-01 S 203	210	3.1	3016	3.72	2.03	21.63	0.90	9.46	12.74	0.22	76.3	26.54	327.79	118.96	483.0	94.3	796	118.0	9054	1.49	92.6	265.4
BC14-01 S 204	301	8.2	1893	1.01	0.06	24.58	0.26	6.05	9.17	2.22	50.4	15.73	195.43	70.12	310.0	68.9	650	102.2	9094	0.51	78.8	87.1
BC14-01 S 205	232	5.7	913	5.42	0.09	7.82	0.10	1.87	3.03	0.16	19.9	7.22	90.43	34.77	143.8	36.3	361	55.9	8286	2.15	68.2	181.8
BC14-01 S 206	210	5.8	852	3.22		9.18	0.01	1.00	2.81	0.13	17.6	6.61	83.78	31.38	136.8	32.4	320	49.3	9013	1.39	44.1	117.0
BC14-01 S 209																						
BC14-01 S 210	254	7.2	824	6.96	0.15	7.07	0.10	2.37	3.82	0.52	21.6	7.55	84.12	30.48	119.2	24.9	234	35.4	9686	2.30	46.5	82.8
BC14-01 S 211	423	6.4	1212	1.71	1.31	22.41	0.69	5.06	4.89	0.88	26.3	9.48	114.86	41.59	183.2	42.3	412	63.3	8920	0.94	109.1	208.5
BC14-01 S 212	275	15.2	767	3.35		41.41	0.05	0.87	3.35	0.52	16.8	6.40	69.28	26.21	121.1	28.0	276	43.4	8747	1.22	70.0	99.5
BC14-01 S 213																						
BC14-01 S 214	262	11.1	1695	2.58	0.08	4.87	0.64	9.37	13.76	1.17	70.2	18.86	194.42	60.24	226.2	44.7	370	53.0	8546	1.49	64.9	80.5
BC14-01 S 215	213	6.4	562	3.11		25.20		0.43	1.27	0.18	6.1	2.95	44.02	19.17	94.8	24.4	261	42.2	10600	1.94	53.4	124.1
BC14-01 S 218	205	7.4	1128	1.58		6.38	0.06	3.26	5.08	0.37	29.6	9.83	116.99	40.86	174.0	36.7	320	54.9	9905	0.71	33.4	71.5
BC14-01 S 226	176	9.1	2827	1.57		6.17	0.47	9.06	18.30	3.83	104.2	28.63	324.43	107.50	413.2	76.3	660	114.2	8409	0.56	95.4	233.8

BC14-01 S 227	347	6.3	1257	0.96		6.69	0.11	1.92	6.38	0.29	32.0	11.01	123.32	46.21	190.6	38.0	309	55.9	11056	0.49	86.7	86.2

>10% discordant

BC14-01 L 1297	28.5	1452	1.16		2.58	0.30	6.16	12.39	1.69	61.9	17.26	170.70	56.03	199.9	41.2	362	50.5	9023	0.73	16.3	21.3	
BC14-01 L 100																						
BC14-01 L 103	68	6.7	923	3.07		7.66	0.11	1.57	4.55	0.02	26.9	9.21	108.68	39.22	163.1	38.6	367	47.8	6401	0.89	54.8	215.6
BC14-01 L 104																						
BC14-01 L 11																						
BC14-01 L 12																						
BC14-01 L 15																						
BC14-01 L 16																						
BC14-01 L 17																						
BC14-01 L 18																						
BC14-01 L 19343	9.2	1957	2.40	0.03	13.35	0.28	5.43	10.20	1.41	59.0	20.25	210.18	73.74	307.4	68.9	682	87.0	7636	0.87	90.4	192.4	
BC14-01 L 20159	6.9	725	3.15	0.03	12.32	0.04	1.93	2.88	0.19	20.3	7.21	75.31	26.81	116.8	26.1	280	38.7	7129	1.23	19.6	72.1	
BC14-01 L 21142	8.6	670	2.91	0.02	11.52	0.06	1.97	3.44	0.21	19.8	6.14	73.86	26.28	112.2	23.0	246	33.6	6596	0.83	19.4	67.6	
BC14-01 L 22																						
BC14-01 L 23																						
BC14-01 L 24316	3.6	908	1.39		4.72	0.08	0.77	2.81		19.3	6.95	91.57	33.27	149.0	36.0	368	51.1	9596	1.12	60.2	266.4	
BC14-01 L 26																						
BC14-01 L 27201	5.8	847	1.40		9.31	0.08	1.46	4.08	0.72	22.8	7.95	88.83	33.04	137.6	33.3	337	45.7	8317	0.72	50.0	157.6	

BC14-01 L 29	204	14.3	718	1.09		9.67	0.14	1.78	4.50	0.90	22.9	6.81	79.70	26.14	111.2	27.3	279	35.7	7952	0.54	38.6	56.9
BC14-01 L 30																						
BC14-01 L 31	211	6.3	726	4.71		22.73		0.53	1.37	0.20	12.7	4.52	62.45	26.21	126.0	35.4	417	56.5	10052	3.22	153.3	342.7
BC14-01 L 32																						
BC14-01 L 33																						
BC14-01 L 34																						
BC14-01 L 35	256	10.9	1329	2.45	0.77	51.75	0.37	3.55	6.27	1.06	34.9	10.45	134.25	50.81	212.5	50.1	460	71.2	10045	1.18	138.7	156.4
BC14-01 L 36	242	20.1	757	1.57	0.02	28.08	0.09	1.63	3.54	0.84	20.9	5.93	78.53	27.64	119.5	27.1	270	40.8	9205	0.63	48.8	56.7
BC14-01 L 38	253	28.0	683	0.75		13.78	0.03	0.48	2.23	0.99	17.1	5.57	70.11	24.87	103.5	24.7	246	35.6	8140	0.45	14.0	19.9
BC14-01 L 41																						
BC14-01 L 42	413	4.6	1881	5.39	0.02	37.37	0.04	1.59	3.93	1.54	35.1	13.30	170.68	66.28	298.5	76.6	811	123.1	9242	1.73	107.0	193.4
BC14-01 L 43																						
BC14-01 L 45	181	4.1	1676	4.25		21.78	0.11	4.44	10.36	0.77	41.3	15.69	179.27	64.33	263.9	56.7	547	71.0	5879	1.44	88.7	194.4
BC14-01 L 48																						
BC14-01 L 49	293	11.8	1809	1.21		10.41	0.42	7.03	13.46	2.34	54.4	18.76	205.39	70.81	289.8	67.3	684	90.5	8335	0.34	99.6	163.9
BC14-01 L 50	179	2.6	705	1.40		9.14	0.09	1.24	3.76	0.47	15.4	5.01	71.45	26.18	115.8	29.3	311	45.3	9968	0.81	51.2	165.9
BC14-01 L 51	160	7.1	683	3.16		34.25	0.03	1.15	3.13	0.49	16.7	5.89	64.58	25.79	110.7	30.6	314	46.9	9947	1.31	110.8	192.2
BC14-01 L 53																						
BC14-01 L 56																						
BC14-01 L 58																						
BC14-01 L 60	261	16.3	1788	0.56	0.00	5.76	0.47	7.63	11.15	1.38	57.6	19.38	217.43	70.23	281.2	62.8	601	79.1	7647	0.52	58.5	126.2

BC14-01 L 65																					
BC14-01 L 66212	7.1	910	2.22		8.70	0.04	0.55	2.52	0.19	16.2	6.85	79.53	33.87	148.2	35.2	338	49.2	10864	1.22	66.9	191.9
BC14-01 L 671266	4.6	7832	1.45		10.35	0.03	0.83	8.92	1.38	78.0	31.70	422.12	169.35	805.1	190.9	2025	349.7	9481	0.23	49.6	167.7
BC14-01 L 68945	5.7	7516	2.53		11.04	0.04	1.26	6.05	1.29	68.1	28.07	386.63	163.49	752.1	178.7	1821	307.3	9351	0.33	47.4	161.7
BC14-01 L 70232	25.6	2051	0.61	0.04	2.48	0.73	10.77	20.09	4.04	88.9	24.06	260.77	80.70	328.9	66.4	584	86.6	7602	0.40	35.4	68.1
BC14-01 L 71373	17.2	820	1.93	2.53	33.07	0.71	5.88	3.52	1.10	17.7	6.66	79.75	31.56	143.4	34.4	356	53.8	9022	1.05	44.8	74.4
BC14-01 L 77																					
BC14-01 L 78																					
BC14-01 L 8																					
BC14-01 L 80																					
BC14-01 L 82																					
BC14-01 L 85																					
BC14-01 L 9122	8.3	433	0.96		8.85	0.00	0.58	1.51	0.10	11.0	3.91	47.11	15.87	67.8	15.7	149	22.2	8737	0.58	53.7	165.3
BC14-01 L 90425	43.0	1206	0.79		3.93	0.45	7.60	15.80	0.86	54.0	17.20	160.64	49.32	185.1	39.4	374	47.7	9151	0.12	158.5	107.0
BC14-01 L 91																					
BC14-01 L 94392	5.6	733	1.43	0.05	4.37	0.07	0.79	2.21	0.32	14.3	5.23	80.08	28.64	127.5	32.4	328	45.1	9841	0.71	113.3	223.5
BC14-01 L 95																					
BC14-01 L 97																					
BC14-01 L 98294	13.6	1084	2.31	2.89	14.54	1.07	6.53	6.75	0.57	29.9	9.45	113.25	40.85	169.9	37.7	365	56.5	7604	1.05	88.2	190.7
BC14-01 S 105																					
BC14-01 S 106																					

BC14-01 S 107	187	7.1	721	1.07		6.40		0.93	2.23	0.33	13.7	6.03	76.77	25.86	123.8	28.7	295	42.1	8829	0.74	32.7	121.4
BC14-01 S 110																						
BC14-01 S 113	393	18.6	1967	1.75	0.49	10.62	0.65	8.18	14.62	2.23	70.5	22.10	232.45	73.89	297.6	64.3	555	77.2	9337	0.93	71.0	186.6
BC14-01 S 114	214	19.9	802	3.55	0.05	45.91	0.26	4.73	7.26	1.94	32.3	7.94	87.61	28.55	118.2	25.6	260	38.7	10145	0.99	139.1	130.7
BC14-01 S 115																						
BC14-01 S 116																						
BC14-01 S 118																						
BC14-01 S 124																						
BC14-01 S 125																						
BC14-01 S 128																						
BC14-01 S 134																						
BC14-01 S 137																						
BC14-01 S 138																						
BC14-01 S 139																						
BC14-01 S 141																						
BC14-01 S 142	384	4.9	955	2.18		4.70		0.50	2.36	0.40	16.2	6.17	84.63	32.61	142.3	33.8	331	50.5	10431	1.25	52.9	259.0

BC14-01 S 145																						
BC14-01 S 147	284	4.9	1678	5.82	0.06	16.55	0.17	2.77	7.17	1.15	43.2	15.27	174.56	62.03	254.0	55.7	493	72.3	9145	1.46	252.4	616.6
BC14-01 S 148	187	16.4	766	0.86	0.23	18.63	0.28	3.83	5.98	1.57	25.0	7.27	80.15	26.61	110.1	25.0	238	36.3	7509	0.21	43.1	49.6
BC14-01 S 156																						
BC14-01 S 158																						
BC14-01 S 159																						
BC14-01 S 161																						
BC14-01 S 166																						
BC14-01 S 168																						
BC14-01 S 169	256	6.1	840	3.50		13.25	0.05	0.91	2.66	0.25	18.0	6.79	79.78	31.40	132.4	32.8	315	46.0	9150	1.61	59.0	164.7
BC14-01 S 172																						
BC14-01 S 175	327	10.9	2735	5.16	0.08	12.47	0.71	13.02	23.81	0.94	102.6	31.88	335.80	109.45	405.3	84.7	712	94.5	10511	3.32	180.2	323.0
BC14-01 S 185																						
BC14-01 S 189	201	7.6	1423	0.25		6.84	0.33	5.00	9.79	2.17	44.4	13.42	146.83	52.90	226.2	45.4	414	77.5	9792	0.23	42.5	52.1
BC14-01 S 190	151	9.4	664	2.69		17.37	0.11	2.52	3.97	0.28	21.6	6.81	74.24	24.87	96.2	19.8	174	30.6	11899	0.94	92.6	162.1
BC14-01 S 192																						

BC14-01 S 201	383	24.1	1556	1.52		3.34	0.31	6.13	9.61	1.36	49.8	16.15	173.19	59.50	240.0	48.6	424	67.3	10695	0.69	35.7	43.8
BC14-01 S 216	155	6.7	588	1.99		18.48	0.03	1.17	3.38	0.12	15.6	5.79	61.28	21.32	89.5	21.1	196	29.9	11423	1.37	136.1	303.2
BC14-01 S 219	243	9.9	965	2.89		7.57	0.03	1.28	4.18	0.23	23.1	7.83	96.11	34.80	148.8	31.8	283	49.6	10910	0.80	33.5	82.3
BC14-01 S 220																						
BC14-01 S 221	261	31.1	1063	1.19		2.56	0.12	3.15	8.34	1.91	35.1	10.87	125.91	40.13	168.7	32.2	301	49.0	9304	0.26	29.0	31.7
BC14-01 S 222	324	11.3	2677	1.73	0.60	13.76	0.80	11.72	18.58	1.96	97.2	28.98	328.82	109.97	422.1	84.6	688	115.6	11283	0.62	173.3	269.5
BC14-01 S 224	188	12.3	625	1.06		10.63	0.04	0.86	2.41	0.39	14.0	4.76	58.54	21.09	97.6	19.1	175	33.2	10425	0.62	42.0	104.4
BC14-01 S 225	209	10.4	1727	0.82		5.15	0.23	4.76	9.91	1.22	55.5	14.52	177.40	63.20	257.2	50.1	449	78.1	10284	0.73	42.1	83.5
BC14-01 S 228																						
BC14-01 S 229	775	20.8	2029	0.54		1.79	0.24	5.78	11.74	0.97	55.9	18.67	215.42	75.52	307.8	66.6	598	110.4	11888	0.37	38.8	67.0
BC14-01 S 230																						
BC14-01 S 231	316	7.8	1488	3.87	0.01	13.49	0.08	2.52	7.05	0.78	37.2	12.09	151.97	55.50	234.3	51.9	474	82.4	12035	1.75	152.1	363.5
BC14-01 S 232	219	13.4	1258	0.85	0.80	20.68	0.47	5.61	8.24	1.74	28.0	9.78	116.85	42.84	194.0	40.7	389	77.8	10816	0.42	76.7	73.6
BC14-01 S 234	216	11.7	565	1.44		6.40		0.34	0.97	0.31	10.3	3.73	55.14	21.40	92.5	21.7	209	37.5	11094	0.95	24.0	69.2
BC14-01 S 235	299	11.4	2478	1.82	0.18	37.44	0.42	9.35	18.32	6.35	86.7	27.59	288.03	96.90	385.5	78.7	697	105.9	8981	0.81	221.4	232.1

Analysis	P	Ti	Y	Nb	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	Th	U
BC14-02																						
<10% discordant																						
BC14-02 L 237	160	14.2	1259	1.43	0.08	21.17	0.59	9.94	10.49	3.75	44.9	12.34	132.95	43.16	174.3	33.8	315	54.0	7476	0.57	115.0	94.6
BC14-02 L 238	242	1.6	1813	1.97		22.13	0.13	3.41	8.99	2.52	41.6	12.85	164.27	61.38	272.4	66.1	595	104.6	8240	0.70	144.8	117.1
BC14-02 L 239																						
BC14-02 L 240	161	13.7	1363	0.49		9.40	0.41	5.41	8.29	1.82	33.8	11.02	129.64	46.25	197.5	43.3	414	69.0	9251	0.42	157.0	236.8
BC14-02 L 241	168	13.5	1161	0.26		9.17	0.29	4.72	6.49	1.24	32.4	10.37	114.95	40.31	162.7	37.8	327	55.4	9650	0.27	111.1	165.7
BC14-02 L 242	304	16.9	1203	1.52	0.09	7.58	0.21	3.34	8.60	0.49	41.3	12.16	132.06	45.19	177.5	38.2	331	51.3	9236	0.97	113.1	174.3
BC14-02 L 243	171	14.7	462	1.56		4.29	0.04	0.82	1.47	0.30	12.3	3.78	43.30	15.68	67.8	14.5	134	22.1	7981	0.71	22.7	28.1
BC14-02 L 244	205	26.8	685	1.54		4.17	0.13	2.27	3.58	0.70	22.2	6.86	75.83	24.26	99.5	19.8	186	28.4	7612	0.53	32.9	28.8
BC14-02 L 245	234	19.9	674	1.19		3.50	0.07	1.82	4.25	0.27	18.7	6.26	72.58	23.60	96.6	20.9	199	30.7	8518	0.37	31.1	36.6
BC14-02 L 246	120	3.6	557	7.72		19.95	0.24	4.18	4.57	1.07	18.5	6.01	63.67	19.84	75.0	17.3	151	22.1	9496	4.24	88.5	145.0
BC14-02 L 249	171	10.7	579	2.13		19.56	0.03	0.91	2.20	0.54	12.4	5.04	52.63	18.61	82.6	19.1	203	30.8	8466	0.92	92.6	207.7
BC14-02 L 253																						
BC14-02 L 255	270	11.0	1000	1.25	0.03	34.20	0.16	2.39	5.20	1.46	26.5	8.85	103.89	36.11	153.4	36.5	364	51.3	8124	0.66	107.0	62.6

BC14-02 L 256	205	11.2	931	1.88		33.53	0.13	3.10	5.35	1.66	25.0	9.22	98.66	35.74	144.5	34.1	339	49.2	8374	0.79	105.2	65.0
BC14-02 L 258	268	8.1	1886	1.30		18.26	0.44	6.27	10.69	3.90	58.2	16.22	198.10	67.88	285.1	64.7	614	89.3	7131	0.67	117.1	97.2
BC14-02 L 259	275	8.5	784	4.44	0.09	18.93	0.04	0.68	3.85	0.11	19.6	6.95	80.56	30.99	136.3	31.2	309	42.0	9445	1.71	85.3	124.1
BC14-02 L 260	212	13.1	486	1.53		8.20		0.55	1.15	0.39	10.2	4.00	50.53	18.59	79.8	18.3	196	27.8	8056	0.62	21.0	35.0
BC14-02 L 261																						
BC14-02 L 262	250	8.0	782	2.58	0.09	29.51	0.11	1.28	2.91	0.45	15.7	6.48	81.21	29.32	135.9	31.7	332	49.3	8726	1.48	104.5	120.0
BC14-02 L 263	243	18.3	1104	0.78		26.92	0.31	5.14	8.57	2.27	38.0	10.75	115.73	40.38	162.6	33.7	323	47.4	7626	0.51	110.5	73.2
BC14-02 L 265	219	29.4	953	1.03	0.04	33.70	0.49	6.16	11.08	2.58	34.4	9.91	112.03	34.98	129.4	29.6	276	38.3	7025	0.66	33.6	35.7
BC14-02 L 268	221	4.7	1157	6.10		14.03	0.05	1.43	4.60	0.16	24.4	9.43	120.56	42.72	187.2	44.2	419	57.4	8779	2.38	72.1	183.2
BC14-02 L 269																						
BC14-02 L 270	274	25.6	744	1.43	0.04	11.05	0.06	1.24	2.54	0.85	15.8	6.18	75.97	26.96	116.6	29.5	280	42.2	7977	0.54	47.7	51.2
BC14-02 L 271	282	6.1	749	1.55	0.05	23.63	0.12	1.45	3.71	0.96	16.5	5.73	72.06	26.94	120.7	28.6	313	45.4	7520	0.76	124.8	109.1
BC14-02 L 272	196	6.5	1900	10.26	0.03	28.25	0.40	6.23	12.79	1.17	69.3	21.74	247.19	80.26	303.5	62.9	572	73.6	5850	3.64	52.1	141.8
BC14-02 L 273																						
BC14-02 L 274																						
BC14-02 L 276	157	17.5	321	0.54		6.18	0.05	0.34	1.23	0.19	5.7	2.13	27.04	11.40	48.5	11.9	118	22.7	10164	0.32	33.3	66.4

BC14-02 L 277																						
BC14-02 L 278	134	5.2	1055	9.33	6.83	32.38	2.03	13.91	7.75	0.59	37.9	10.42	118.50	40.21	161.4	31.2	255	41.5	6832	3.22	77.3	51.0
BC14-02 L 279	197	11.2	1144	1.92		7.20	0.15	2.89	6.35	0.47	38.1	11.13	126.74	42.06	170.2	33.6	303	47.0	9193	0.88	73.2	74.0
BC14-02 L 280	404	11.8	2461	1.97		11.19	0.58	9.94	16.73	0.29	83.8	24.31	274.71	95.21	360.6	72.6	612	96.0	8400	1.12	113.9	191.9
BC14-02 L 281	416	12.6	2558	1.88	0.96	13.92	0.78	16.33	20.05	0.48	84.9	27.17	293.06	98.75	379.5	76.6	622	94.3	8680	1.46	124.7	209.0
BC14-02 L 282	130	6.2	1880	4.49		12.83	0.43	9.04	14.40	0.91	65.0	18.68	218.48	71.72	286.9	56.8	510	70.1	7614	2.26	93.6	141.6
BC14-02 L 283	168	10.3	584	1.31		11.09	0.03	1.65	3.51	0.17	19.7	5.53	62.69	21.14	85.7	17.6	164	25.0	9360	0.74	68.9	150.9
BC14-02 L 284																						
BC14-02 L 285	221	14.3	1104	1.43		9.17		1.24	3.87	0.44	23.0	8.48	112.07	40.18	171.4	39.6	370	55.3	9061	1.03	104.4	124.2
BC14-02 L 286	219	14.0	637	1.87		7.40		0.72	1.47	0.24	12.8	4.61	57.14	23.70	106.2	25.6	248	39.5	8922	0.95	60.1	91.5
BC14-02 L 289	225	4.9	1876	0.41		7.41	0.26	5.59	10.00	2.06	48.9	16.39	199.58	69.73	302.5	66.9	623	93.5	5928	0.23	52.7	89.3
BC14-02 L 290																						
BC14-02 L 291	244	12.4	693	2.02		9.05	0.05	0.45	2.88	0.14	15.3	5.08	62.50	24.48	110.8	26.4	264	37.2	8515	1.23	67.4	111.1
BC14-02 L 292																						
BC14-02 L 293	219	14.0	792	1.74	0.00	5.34	0.09	2.18	3.99	0.15	20.6	6.42	81.89	29.57	126.0	28.4	276	37.7	7589	1.13	43.2	68.6
BC14-02 L 296	272	26.4	995	0.60		2.97	0.18	4.49	8.20	0.80	41.7	11.84	121.25	37.80	146.7	30.2	295	39.7	8072	0.26	48.5	56.2

BC14-02 L 297	332	20.0	965	1.15	0.05	4.48	0.17	4.50	7.82	0.47	38.4	10.75	116.83	35.12	141.3	29.0	264	35.1	7783	0.39	51.3	53.0
BC14-02 L 300	308	10.1	935	2.42		39.10	0.02	1.53	4.09	1.10	22.4	8.01	89.80	34.09	151.3	37.3	374	56.1	8097	0.87	116.7	117.0
BC14-02 S 303	273	6.3	2307	3.20	0.01	16.44	0.60	8.87	15.96	1.21	70.1	23.48	253.97	84.60	358.2	80.6	762	110.8	7240	1.23	335.2	279.4
BC14-02 S 304	349	8.8	1476	1.87	0.30	19.11	0.18	3.74	5.32	1.34	30.9	11.23	140.65	51.09	234.0	59.6	592	88.6	7720	0.57	61.8	74.1
BC14-02 S 305	509	6.9	1077	0.56		1.06	0.12	1.84	6.50	0.29	42.9	15.23	145.84	37.06	116.0	21.2	163	19.0	10737	0.29	47.2	396.4
BC14-02 S 306																						
BC14-02 S 307																						
BC14-02 S 309																						
BC14-02 S 311	162	7.8	772	5.25		9.90	0.10	1.07	4.32	0.80	20.1	7.22	82.74	29.26	118.6	25.1	239	35.7	8274	1.95	52.8	52.2
BC14-02 S 312	394	22.0	1181	0.91		2.70	0.15	4.01	8.30	0.86	35.9	11.57	127.70	44.08	177.2	39.2	348	54.4	8460	0.53	30.4	52.3
BC14-02 S 313	296	7.3	3646	0.99		13.66	0.34	7.32	14.62	7.40	83.3	27.97	316.40	114.30	477.9	102.2	907	147.2	6653	0.34	84.0	111.0
BC14-02 S 315																						
BC14-02 S 318	221	4.6	690	0.72		5.10	0.01	0.76	1.84	0.54	13.1	3.95	54.65	21.70	106.6	25.4	275	53.8	8701	0.17	38.6	131.4
BC14-02 S 319	422	8.5	1531	2.03		20.65	0.20	2.86	5.29	1.84	28.8	10.09	134.04	53.19	255.6	62.5	594	118.5	10387	1.19	169.4	192.4
BC14-02 S 320																						
BC14-02 S 321																						

BC14-02 S 323																						
BC14-02 S 325																						
BC14-02 S 327	238	6.2	1358	2.17		6.57	0.09	3.12	5.05	0.43	28.2	10.07	132.04	51.12	221.0	45.1	394	71.5	11186	1.08	52.7	68.7
BC14-02 S 328	379	5.0	1438	2.33		9.99	0.04	1.49	3.93	0.31	23.8	9.07	122.48	52.51	227.3	49.9	443	82.8	10637	1.45	67.6	83.9
BC14-02 S 329	248	5.5	967	4.20		13.03	0.03	0.50	2.15	0.01	20.7	6.72	86.74	33.95	154.9	32.5	313	57.7	11797	1.80	139.6	135.8
BC14-02 S 330																						
BC14-02 S 331																						
BC14-02 S 335	656	19.1	1799	0.45	0.06	2.59	0.12	2.45	6.76	0.03	40.5	12.71	162.89	61.96	272.3	60.1	515	92.4	11815	0.26	83.0	211.1
BC14-02 S 336	321	7.4	1018	1.82	0.09	33.87	0.04	1.41	3.81	0.86	23.8	8.33	100.27	35.95	169.5	38.2	364	63.8	10650	1.12	182.5	138.7
BC14-02 S 338	636	7.2	1743	1.28	0.01	12.38	0.08	1.84	5.82	1.45	35.4	12.61	167.96	66.49	299.4	65.4	648	111.6	10342	0.59	99.3	112.6
BC14-02 S 339	291	16.9	946	1.63		5.42	0.12	2.36	6.05	0.31	27.8	9.62	104.92	36.54	152.0	32.0	285	43.9	10328	0.86	69.6	76.5
BC14-02 S 340	262	5.7	941	4.22		16.02		1.10	2.57	0.09	17.8	6.48	85.00	33.16	155.2	38.0	355	59.9	11226	1.98	86.4	166.1
BC14-02 S 344	218	4.5	602	1.45		31.61	0.09	2.00	3.02	1.07	13.3	4.17	54.29	19.49	95.7	23.7	268	42.9	8379	0.84	289.1	230.4
BC14-02 S 345	608	7.1	1708	1.48	0.05	4.53	0.13	2.90	5.59	0.17	35.8	12.76	175.74	66.19	274.8	64.1	597	83.5	9316	0.93	130.6	388.7
BC14-02 S 347																						
BC14-02 S 349																						

BC14-02 S 351	229	13.1	709	2.85	0.04	8.67	0.05	0.75	2.25	0.14	17.9	6.41	67.85	23.86	106.2	23.4	213	32.7	8979	1.12	62.4	77.6
BC14-02 S 354	194	12.8	549	1.78		6.67	0.04	1.04	1.53	0.16	13.5	4.56	54.77	19.90	83.4	19.2	173	27.0	9357	0.95	61.5	104.5
BC14-02 S 356	377	9.7	1586	1.38		20.66	0.18	2.80	6.25	1.55	32.9	11.01	144.00	53.70	245.7	55.8	540	88.3	9169	0.92	151.0	114.9
BC14-02 S 357	200	3.2	932	2.51	0.03	4.17	0.03	0.50	1.38	0.27	16.4	5.62	77.44	32.25	147.2	33.4	329	54.6	9378	1.54	35.3	85.5
BC14-02 S 358	318	7.3	1490	1.54	0.02	7.98	0.30	6.11	12.25	2.13	52.2	15.64	168.37	58.00	232.2	46.9	434	69.7	8592	0.52	60.5	41.6
BC14-02 S 361	279	20.9	1659	0.73		6.35	0.20	5.00	7.20	2.55	42.6	14.60	166.95	58.45	241.6	50.9	459	78.0	8928	0.38	29.9	30.3
BC14-02 S 363	263	5.1	1736	4.79	0.03	11.60	0.09	2.55	5.10	0.58	37.3	13.35	160.87	60.52	262.9	54.4	474	81.9	11270	2.34	52.8	77.3
BC14-02 S 367																						
BC14-02 S 369																						
BC14-02 S 371	202	8.8	1275	1.17	0.69	9.64	0.39	5.38	7.43	0.61	40.3	11.65	130.63	46.73	189.5	40.5	351	61.8	9660	0.59	69.6	124.7
BC14-02 S 373																						
BC14-02 S 376	189	6.9	687	4.89	0.27	5.79	0.17	2.19	3.75	0.37	15.7	6.23	68.52	24.30	109.5	22.9	212	33.7	10225	2.63	50.1	121.6
BC14-02 S 380	125	13.2	459	1.86		5.81	0.13	1.64	2.28	0.07	12.9	4.12	46.12	18.40	73.2	16.0	147	22.0	9693	0.70	50.6	70.3
BC14-02 S 385	149	3.6	648	0.77		4.82		0.64	2.31	0.51	13.1	4.67	55.10	21.26	101.2	23.7	245	37.3	7984	0.27	53.5	102.6
BC14-02 S 388	232	9.7	957	1.17		21.53	0.10	2.00	3.91	1.05	21.1	7.33	88.74	33.28	147.5	37.6	354	56.6	8846	0.64	77.6	75.9
BC14-02 S 391	194	4.5	1223	24.29	0.02	14.94	0.03	0.93	3.30	0.04	25.0	9.30	111.63	42.70	197.4	44.9	435	64.1	11665	10.08	162.0	323.8

BC14-02 S 392	301	1.9	2169	2.38	1.28	19.43	0.51	4.94	6.86	0.95	46.1	15.74	206.90	80.41	348.9	76.1	693	110.0	8925	0.75	62.4	122.8
BC14-02 S 395	229	6.7	913	2.35		19.57	0.06	1.08	2.60	0.82	16.7	5.61	74.42	31.29	152.2	42.5	464	74.5	9213	1.08	95.0	124.5
BC14-02 S 396	352	5.0	1660	5.49	1.13	24.06	0.53	5.55	7.01	0.14	41.3	14.04	174.72	60.46	261.8	60.6	556	77.4	8583	1.61	80.5	115.2
BC14-02 S 397	258	14.9	818	0.88		6.86	0.02	1.61	4.34	0.58	21.2	6.47	85.07	30.60	129.4	29.3	278	40.9	7907	0.42	42.5	56.2
BC14-02 S 400	300	22.1	893	0.67		34.93	0.07	2.61	5.28	1.82	26.3	8.20	94.90	33.47	143.1	30.2	308	45.4	7720	0.17	46.8	29.6
BC14-02 S 401																						
BC14-02 S 402																						
BC14-02 S 403	379	9.5	1428	2.99	0.01	31.42	0.19	3.76	8.54	2.19	40.0	12.01	148.58	53.85	245.3	55.0	526	80.1	9682	1.75	224.8	157.4
BC14-02 S 407																						
BC14-02 S 408	129	5.7	613	0.95		18.52	0.03	1.25	2.29	1.00	12.1	4.04	50.68	19.34	95.3	25.2	264	51.1	9717	0.31	146.8	139.6
>10% discordant																						
BC14-02 L 248	192	26.4	387	0.80	0.06	4.70	0.10	1.85	1.87	0.10	11.4	3.17	41.22	14.09	55.8	12.7	133	18.9	8040	0.38	20.8	26.3
BC14-02 L 250	268	15.3	1151	0.93		24.71	0.26	4.24	10.06	2.11	37.9	10.34	122.13	40.41	168.6	37.8	352	47.8	8487	0.24	45.2	22.9
BC14-02 L 251	267	12.2	880	0.80		20.37	0.13	3.49	6.87	1.64	27.4	9.22	91.83	32.87	138.0	30.7	294	41.3	8111	0.22	35.8	19.7
BC14-02 L 252	173	4.4	471	4.26		4.67		0.46	1.47	0.11	8.8	3.14	43.00	16.64	72.0	18.3	185	26.1	8016	1.89	26.9	64.3
BC14-02 L 254	255	15.5	1525	0.49		12.07	0.35	5.54	8.21	1.28	41.6	14.77	162.08	55.56	239.7	52.6	499	70.0	7694	0.31	111.6	101.8

BC14-02 L 257	333	4.2	2921	2.02	0.10	24.64	0.50	8.69	12.08	6.10	83.6	25.72	310.77	107.45	434.7	96.9	953	135.2	7418	0.74	209.3	149.5
BC14-02 L 264																						
BC14-02 L 266																						
BC14-02 L 267																						
BC14-02 L 275	193	17.3	478	0.68		5.96	0.03	0.77	1.71	0.35	10.3	3.45	41.36	15.09	70.0	16.1	161	30.3	9743	0.28	40.2	62.8
BC14-02 L 287	205	7.9	734	1.88		7.34	0.05	0.81	2.81	0.29	15.7	5.67	75.89	26.69	118.9	26.4	262	40.0	8505	0.79	29.6	56.1
BC14-02 L 288																						
BC14-02 L 294																						
BC14-02 L 295	206	23.4	442	2.84		9.14	0.08	1.58	1.80	0.13	10.6	3.65	45.41	15.50	68.3	16.1	176	25.3	7943	1.09	15.9	18.3
BC14-02 L 299																						
BC14-02 L 301																						
BC14-02 L 302																						
BC14-02 S 308	222	10.6	1028	6.18		20.81	0.20	5.18	11.05	0.32	40.6	11.82	124.58	38.79	141.5	29.2	255	36.3	8191	2.50	151.1	437.8
BC14-02 S 314	129	8.8	1652	26.86		39.88	0.56	9.50	18.83	4.93	82.2	22.26	221.60	69.10	241.3	46.3	370	51.0	5887	7.86	304.4	280.6
BC14-02 S 316																						
BC14-02 S 322																						

BC14-02 S 324																						
BC14-02 S 334	343	3.8	2303	2.22	0.23	29.37	0.17	5.29	10.78	2.48	63.0	19.43	231.47	87.38	375.4	77.7	706	125.1	9528	0.74	133.7	147.9
BC14-02 S 341																						
BC14-02 S 342																						
BC14-02 S 346	101	2.8	338	8.05		2.87		0.25	1.02	0.10	5.3	2.04	27.69	10.77	57.0	15.8	163	25.7	9816	4.44	29.0	97.9
BC14-02 S 350																						
BC14-02 S 355																						
BC14-02 S 362	199	11.3	692	2.15		30.90	0.03	0.96	2.21	0.67	13.8	5.20	61.27	23.63	106.7	25.4	233	43.7	10912	1.22	124.7	93.8
BC14-02 S 368	275	8.9	1037	3.82		29.62	0.00	1.01	1.99	0.72	14.5	6.90	83.40	32.91	150.2	37.7	348	73.7	12021	1.88	73.0	129.8
BC14-02 S 377	309	11.3	1175	5.10	0.06	48.54	0.30	3.57	6.19	1.59	24.5	8.79	108.16	39.47	191.0	45.8	437	74.5	10762	1.85	154.7	280.6
BC14-02 S 378	210	8.1	994	5.97	0.40	10.02	0.05	1.61	3.28	0.13	20.3	7.52	95.62	36.35	155.3	34.6	324	49.3	10347	2.53	84.1	138.8
BC14-02 S 379	347	7.9	1258	2.59		23.72	0.08	1.77	3.62	0.91	23.1	8.71	117.08	43.76	206.1	50.0	470	76.0	9929	1.01	91.0	144.6
BC14-02 S 382																						
BC14-02 S 383																						
BC14-02 S 399	445	15.1	1661	1.74	0.33	15.55	0.22	2.33	6.41	1.45	34.4	13.44	170.02	61.76	261.0	61.3	582	84.4	8897	0.84	72.8	104.0
BC14-02 S 405	294	6.6	1184	2.27	0.02	18.00	0.08	1.68	4.25	1.34	26.3	8.83	112.88	44.18	203.8	46.9	451	77.4	11193	1.20	160.6	171.8

Analysis	P	Ti	Y	Nb	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	Th	U
BC14-02 S 412																						
BC14-02 S 413	218	15.6	1574	1.72		16.20	0.36	4.76	7.90	1.78	43.5	13.86	162.32	55.22	233.0	47.3	404	75.8	10906	0.70	159.1	223.4

Analysis	**P**	**Ti**	**Y**	**Nb**	**La**	**Ce**	**Pr**	**Nd**	**Sm**	**Eu**	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**	**Hf**	**Ta**	**Th**	**U**
BC14-03																						
<10% discordant																						
BC14-03 L 415	248	12.9	885	3.43		8.65	0.00	1.36	2.53	0.29	19.5	6.98	84.50	30.15	134.8	30.1	266	46.0	10519	1.22	91.9	139.0
BC14-03 L 416	313	15.8	1348	1.58		15.17	0.22	3.58	5.50	1.55	35.4	10.46	124.10	48.77	211.3	46.2	399	69.9	9528	0.89	90.3	83.0
BC14-03 L 418	297	2.6	1458	2.23	0.06	10.92	0.15	3.05	4.94	0.94	29.4	10.51	142.18	52.14	244.6	56.1	522	96.4	9944	0.77	38.6	63.0
BC14-03 L 419	299	6.2	1221	3.54		22.47	0.06	1.03	2.73	0.29	18.5	7.87	107.16	42.38	198.4	49.2	454	81.0	11874	1.63	60.2	103.3
BC14-03 L 420																						
BC14-03 L 421	109	5.4	336	0.53		2.10			0.22	0.17	5.8	1.98	26.90	12.01	58.1	13.7	138	26.7	10385	0.12	9.2	33.6
BC14-03 L 423	218	12.1	1107	1.20		7.91	0.32	5.17	11.34	0.65	50.6	13.44	130.21	42.49	161.2	29.7	241	42.8	11751	0.81	130.4	139.2
BC14-03 L 424	243	7.6	1011	2.93		10.14	0.06	0.59	3.39	0.19	23.0	7.66	96.32	36.29	159.2	34.2	314	50.5	11409	1.32	91.7	328.6
BC14-03 L 426	119	5.3	392	0.45	0.02	5.01		0.40	1.17	0.20	8.1	2.88	35.50	13.09	62.3	14.0	142	23.1	10835	0.36	25.0	99.2
BC14-03 L 427																						

BC14-03 L 428																						
BC14-03 L 429	241	6.9	824	1.14		7.05	0.09	1.68	2.24	0.40	19.9	6.50	81.79	30.34	131.2	29.4	288	43.9	9668	0.69	45.3	113.4
BC14-03 L 430																						
BC14-03 L 431	187	19.8	453	0.63		6.03	0.03	0.91	1.98	0.26	9.6	3.74	40.60	16.00	73.5	17.2	172	26.3	8893	0.45	36.6	40.9
BC14-03 L 432	219	18.5	1078	0.96		9.36	0.08	1.23	4.97	0.54	26.7	8.94	109.78	40.66	172.3	39.2	371	53.7	9361	0.52	87.1	75.6
BC14-03 L 433	155	7.4	935	1.93		6.18	0.03	2.00	5.11	0.54	23.2	8.45	95.63	34.89	149.1	32.7	313	45.2	7594	0.73	33.3	86.3
BC14-03 L 434	290	3.6	1222	1.75		3.60	0.08	1.26	5.19	0.82	29.5	10.10	127.40	46.30	197.5	45.5	434	62.5	6866	0.81	45.5	78.7
BC14-03 L 435	158	4.0	698	2.30		4.52	0.04	0.31	2.45	0.34	16.0	5.24	69.25	26.45	118.0	27.2	261	37.9	7856	0.96	31.2	59.3
BC14-03 L 436	216	8.5	2515	1.93	0.06	107.08	0.43	8.53	16.04	5.63	68.6	24.43	287.82	101.55	430.2	96.2	830	110.0	6868	0.83	69.7	28.7
BC14-03 L 437	222	8.5	826	1.46		9.28		0.69	2.33	0.40	18.8	5.46	74.65	29.19	128.1	32.2	312	45.7	9326	0.96	36.0	61.2
BC14-03 L 441	163	14.0	445	2.51		7.67	0.05	1.39	3.01	0.12	15.9	5.18	54.29	17.15	66.4	15.5	140	18.4	9029	1.19	42.6	129.6
BC14-03 L 442	185	11.1	546	3.46		9.12	0.05	2.13	4.19	0.06	16.5	5.67	64.32	21.13	82.8	16.9	172	21.6	9436	1.55	61.3	183.5
BC14-03 L 443	183	17.2	466	1.23		4.59	0.05	0.87	2.52	0.18	13.0	4.35	48.45	17.01	70.4	15.7	154	20.7	8922	0.37	42.1	84.8
BC14-03 L 444	220	14.3	1325	1.00	0.03	9.11	0.44	7.33	11.62	0.50	45.8	14.61	158.07	49.69	203.0	41.9	395	47.8	8667	0.81	153.1	200.7
BC14-03 L 445																						
BC14-03 L 447	111	2.0	1142	0.70		2.66	0.11	2.91	7.53	0.77	36.2	11.57	127.26	43.89	178.0	39.0	398	53.8	7791	0.36	19.7	53.8

BC14-03 L 450	339	15.5	753	0.63		1.63	0.07	0.94	2.85	0.07	16.4	6.33	76.60	27.94	114.4	28.0	271	34.1	9527	0.47	44.5	101.2
BC14-03 L 451	199	11.2	678	2.59		7.70	0.04	1.42	3.15	0.24	13.7	6.13	65.51	24.36	102.2	23.6	243	30.5	9200	1.24	63.0	184.9
BC14-03 L 453																						
BC14-03 L 454	169	6.6	765	8.08	0.09	16.87	0.12	2.34	5.10	0.13	19.1	7.21	83.85	30.07	132.4	30.8	301	39.6	8997	3.50	86.9	327.5
BC14-03 L 455	54	9.9	2294	1.58	0.08	12.29	0.71	10.52	15.05	1.88	61.8	20.91	246.53	88.63	400.8	90.3	817	133.2	7239	0.66	104.9	264.3
BC14-03 L 456	41	9.1	1709	0.98	0.04	9.02	0.54	7.36	12.80	1.23	48.0	16.07	184.51	68.36	299.4	67.8	610	100.0	7488	0.53	70.4	181.5
BC14-03 L 457	156	3.5	863	0.69		14.99		0.66	1.73	0.72	14.4	5.25	74.63	28.24	138.6	28.5	275	52.7	11371	0.50	215.1	177.7
BC14-03 L 458	187	4.9	550	0.79		11.56	0.01	0.30	1.13	0.39	8.5	3.27	45.70	17.66	92.4	20.9	213	38.1	11820	0.78	118.7	127.1
BC14-03 L 459	227	4.6	1285	4.88		14.25	0.04	1.52	4.00	0.24	25.6	10.04	123.26	48.02	215.4	45.3	400	64.5	11276	2.23	98.1	146.4
BC14-03 L 460																						
BC14-03 L 461	285	4.2	1474	3.47		14.25	0.03	1.63	4.07	0.10	23.8	9.90	125.42	50.24	235.7	55.2	512	86.5	12280	1.47	153.2	285.0
BC14-03 L 462	256	11.8	1467	0.93		5.48	0.09	3.03	6.48	0.63	33.7	11.43	140.18	52.17	241.7	50.8	468	78.8	9191	0.48	61.3	86.2
BC14-03 L 463	210	21.8	534	2.06		14.76	0.06	1.21	2.73	0.51	13.9	4.96	53.50	20.06	97.0	22.9	216	36.3	10588	0.95	26.1	28.7
BC14-03 L 464	134	11.3	715	0.86		3.94	0.04	1.25	2.72	0.44	16.2	5.84	71.71	26.04	122.9	27.4	251	39.3	8570	0.81	31.1	92.3
BC14-03 L 465	113	7.8	1876	0.74	0.01	5.05	0.37	5.50	11.44	1.27	54.2	18.06	206.51	72.64	294.4	62.8	564	85.0	8100	0.60	50.9	118.8
BC14-03 L 466	325	8.4	1976	23.25		105.68	0.11	2.33	7.75	1.21	41.9	16.51	205.98	74.75	311.3	66.8	602	85.0	8089	6.44	221.4	81.2

BC14-03 L 469	321	4.3	583	1.03	0.10	7.19	0.10	1.23	1.57	0.51	9.0	3.36	46.25	18.42	95.5	25.4	269	47.9	8951	0.39	43.7	100.4
BC14-03 L 471	225	24.2	551	0.83		2.24	0.07	1.25	3.30	0.14	15.3	4.95	57.63	19.20	84.1	18.7	159	23.8	8946	0.31	33.4	47.3
BC14-03 L 474	139	6.0	1354	4.48		14.53	0.14	3.27	5.49	0.40	36.7	12.23	137.74	49.82	199.3	44.3	405	55.1	5995	1.57	39.5	124.8
BC14-03 L 475	137	2.5	616	0.67		3.51	0.07	1.71	1.90	0.10	12.7	3.93	52.10	19.68	103.1	25.8	281	46.5	5911	0.28	26.2	91.9
BC14-03 L 476	134	6.8	985	0.11		3.15	0.11	2.13	3.88	0.79	24.2	7.73	94.18	32.80	146.4	36.6	356	51.0	8223	0.18	72.6	143.0
BC14-03 L 479	205	9.1	733	1.49		9.05	0.00	0.37	1.52	0.21	10.8	4.60	61.02	24.43	111.6	28.5	313	42.8	8977	0.75	53.0	115.1
BC14-03 L 480	253	3.2	1057	1.92		10.39	0.04	1.06	4.16	0.32	20.5	7.51	88.56	34.51	157.9	39.2	407	55.6	8902	0.80	63.7	103.5
BC14-03 L 481																						
BC14-03 L 482	329	14.8	1248	2.06		28.62	0.15	3.79	6.26	1.37	33.0	10.39	122.55	45.87	194.5	47.7	479	65.0	8855	0.95	59.7	96.5
BC14-03 L 483																						
BC14-03 L 489	238	11.0	1196	1.55	0.49	15.13	0.42	5.62	7.55	0.83	39.6	11.71	127.96	43.99	172.5	37.4	357	43.9	7931	0.86	127.3	242.6
BC14-03 L 490	277	7.9	1780	1.26		16.62	0.27	4.73	10.65	1.87	54.8	16.66	199.33	67.36	275.1	63.4	598	79.3	7316	0.44	129.9	146.4
BC14-03 L 491																						
BC14-03 L 493	276	20.6	748	1.08		40.01	0.15	3.56	6.78	1.82	29.8	7.55	82.36	28.82	115.9	27.0	269	37.2	6025	0.38	23.8	22.1
BC14-03 L 495	156	5.3	394	3.27		11.34	0.04	0.17	0.73	0.16	3.9	2.12	28.76	13.05	65.9	20.1	230	33.9	8843	2.15	65.2	182.9
BC14-03 L 496																						

BC14-03 L 497																						
BC14-03 S 503	158	6.6	711	9.88		11.74	0.03	1.13	3.16	0.10	16.6	5.58	73.88	26.38	111.2	25.7	258	34.5	9080	4.09	38.2	165.9
BC14-03 S 504	240	9.6	1278	1.94	0.02	18.15	0.10	1.87	3.22	2.75	28.7	9.40	109.65	42.57	183.8	45.8	480	74.0	6638	0.49	58.7	89.5
BC14-03 S 505	458	3.6	1510	2.74	0.01	26.89	0.13	2.55	6.25	2.00	35.6	11.90	143.92	53.85	234.7	57.6	558	84.4	7504	0.95	105.8	140.4
BC14-03 S 506	181	12.0	1209	1.92	0.05	8.12	0.24	3.72	6.16	0.50	34.6	9.35	117.69	39.95	167.9	37.5	369	50.6	8006	0.95	84.7	202.8
BC14-03 S 507	177	13.0	433	0.99	0.01	8.37	0.04	0.80	1.94	0.20	10.4	3.56	42.96	14.47	61.8	14.2	137	19.7	8313	0.42	45.3	111.3
BC14-03 S 508	141	8.5	620	4.36		8.59	0.04	0.93	1.74	0.17	12.0	4.49	62.01	22.26	94.7	21.5	199	26.4	8230	1.66	17.9	33.0
BC14-03 S 509	351	17.6	1170	1.66	0.10	34.06	0.36	5.29	8.62	2.90	38.3	10.94	123.95	38.88	163.9	35.9	342	50.2	7791	0.79	99.8	63.3
BC14-03 S 510	257	19.9	1597	1.47	0.04	8.57	0.36	6.66	11.07	1.89	55.1	15.46	173.47	57.65	227.0	50.1	455	67.1	8151	0.64	61.6	95.0
BC14-03 S 512	113	4.3	230	0.45		3.22	0.01	0.52	0.77	0.20	5.8	1.75	19.68	6.74	31.7	7.4	76	13.0	8900	0.23	24.7	56.5
BC14-03 S 513	334	8.3	2076	0.70	0.01	10.15	0.47	8.60	12.53	1.44	73.7	21.57	228.97	76.33	283.5	56.0	476	66.4	8088	0.35	160.7	185.0
BC14-03 S 515																						
BC14-03 S 517	309	15.6	1494	1.03	0.04	2.63	0.26	5.18	8.93	1.45	50.0	14.62	159.62	52.28	215.9	46.9	426	66.0	8981	0.50	30.1	63.1
BC14-03 S 518	173	10.2	1259	1.01	0.03	6.34	0.15	2.34	5.23	0.64	30.8	10.02	118.88	41.35	180.6	39.5	342	55.0	9609	0.26	73.8	131.4
BC14-03 S 523																						
BC14-03 S 526																						

BC14-03 S 529																						
BC14-03 S 532	240	18.2	800	2.96	0.50	8.56	0.28	2.26	3.62	0.37	22.8	6.87	79.39	26.33	112.5	23.2	207	33.5	9530	0.91	64.5	54.4
BC14-03 S 533	299	5.3	2194	3.00	0.26	12.03	0.33	5.36	6.85	1.48	43.1	15.95	197.48	76.83	326.1	69.5	604	102.7	7736	0.88	56.7	110.1
BC14-03 S 535	220	7.5	755	2.52	0.06	30.41	0.16	2.77	3.75	1.16	17.2	5.91	67.86	25.10	107.1	27.9	270	43.8	9393	1.47	60.5	95.8
BC14-03 S 544	195	4.6	1485	8.79	0.03	15.74	0.23	4.05	8.32	0.04	42.0	13.79	152.77	54.47	223.2	49.0	448	63.8	8035	2.56	130.6	368.7
BC14-03 S 547	245	8.7	967	3.87		9.21	0.08	1.69	3.74	0.36	24.3	8.02	90.99	34.34	140.6	32.1	292	39.9	7553	1.56	30.5	80.5
BC14-03 S 548	367	12.8	2729	2.22	0.07	48.48	0.51	10.90	18.21	5.03	82.2	23.60	280.59	95.43	396.5	88.8	868	128.4	6721	0.51	240.1	150.4
BC14-03 S 551	170	8.7	1202	0.28	0.02	4.16	0.25	3.35	6.41	1.65	33.3	10.58	124.91	39.78	170.8	37.9	334	51.6	6416	0.14	28.7	76.6
BC14-03 S 552	218	5.4	939	2.40		8.73	0.08	1.36	4.83	0.12	21.8	7.43	90.42	33.61	136.8	32.6	281	42.1	7337	0.79	41.9	80.0
BC14-03 S 553	152	5.4	588	9.13		17.38	0.04	1.18	2.06	0.61	14.3	4.40	51.30	19.47	85.5	21.4	211	33.1	8845	4.20	54.2	105.3
BC14-03 S 555																						
BC14-03 S 561	200	19.8	991	1.52		5.64	0.21	3.86	6.28	0.57	30.4	8.55	100.80	31.99	132.6	27.8	249	42.2	9066	0.61	37.5	93.7
BC14-03 S 563	158	13.0	544	0.83		3.60	0.05	0.38	1.74	0.18	11.5	3.87	44.20	17.61	80.0	17.7	151	27.3	9484	0.41	33.5	52.3
BC14-03 S 564																						
BC14-03 S 565	318	36.4	1989	2.70	0.03	17.58	0.51	8.09	15.64	8.32	83.7	21.19	216.33	66.69	252.3	47.1	383	66.2	9199	1.39	63.3	40.8
BC14-03 S 567																						

BC14-03 S 571	256	5.6	1047	4.24		20.40	0.03	0.48	3.04	0.24	17.4	6.87	86.47	34.27	157.9	35.3	313	56.6	10813	1.49	71.9	95.7
BC14-03 S 574	798	17.5	2016	0.48		1.93	0.28	5.13	11.41	0.60	48.9	17.24	197.97	68.88	278.7	57.6	514	85.7	10007	0.42	57.9	137.2
BC14-03 S 579	1182	7.5	2906	1.07	0.18	3.56	0.22	3.15	6.38	0.23	47.4	18.38	261.68	101.20	430.9	95.3	872	139.4	10065	0.46	39.4	106.8
BC14-03 S 587	182	4.8	981	7.78		13.10	0.06	0.98	3.35	0.17	19.9	8.05	99.49	36.21	147.1	32.5	308	42.0	7063	2.09	34.8	138.7
BC14-03 S 597	142	15.5	547	0.65		6.87	0.09	0.93	2.40	0.26	13.9	4.22	53.22	18.86	84.4	19.3	185	25.8	8799	0.44	47.0	145.7
BC14-03 S 598																						
BC14-03 S 599	292	6.3	906	1.53		12.43	0.06	1.57	4.02	0.47	23.1	8.12	89.01	32.43	140.8	31.6	302	43.6	9456	0.48	110.0	132.9
BC14-03 S 600	150	20.9	641	2.40	0.17	5.49	0.15	3.06	4.99	0.43	19.6	6.40	70.54	25.27	96.6	20.0	187	26.4	7423	1.15	38.2	80.4
BC14-03 S 601	160	11.7	1341	1.47	0.05	7.49	0.25	2.52	5.60	0.74	30.2	10.70	123.48	45.74	201.2	42.4	365	68.0	9008	0.76	57.6	73.2
BC14-03 S 604	236	4.9	1044	1.51	0.02	12.72	0.03	0.89	2.15	1.22	18.8	6.85	90.41	34.35	171.4	42.7	428	70.8	10230	0.41	77.1	112.3
>10% discordant																						
BC14-03 L 417	291	11.8	953	1.89		15.03	0.10	0.83	3.90	0.77	18.6	6.56	82.85	33.68	147.5	33.7	312	54.4	10000	0.68	73.8	81.5
BC14-03 L 422																						
BC14-03 L 438	272	19.5	841	1.24		5.45	0.07	1.41	3.51	0.70	20.8	7.52	86.40	32.13	139.7	31.5	327	43.7	7630	0.59	27.1	61.6
BC14-03 L 439	159	9.8	779	4.48		7.55	0.07	1.57	3.34		23.4	7.48	88.10	29.87	120.4	26.7	247	32.4	8664	1.73	100.8	72.0
BC14-03 L 440																						

BC14-03 L 448	229	8.6	865	2.74		13.57	0.04	0.40	1.95	0.17	13.8	5.48	71.47	31.22	143.6	36.0	393	53.5	9968	1.44	61.2	155.7
BC14-03 L 452	130	14.2	464	1.33		4.29	0.07	0.60	1.72	0.22	11.0	4.25	49.41	16.61	74.8	16.5	169	22.4	8398	0.61	27.9	83.4
BC14-03 L 467																						
BC14-03 L 468																						
BC14-03 L 470																						
BC14-03 L 472																						
BC14-03 L 473	119	6.3	984	2.62		6.36	0.08	1.79	3.88	0.17	23.8	8.53	100.59	35.69	153.5	35.8	343	49.5	5779	1.33	19.8	96.0
BC14-03 L 477	143	5.2	541	0.53		1.63	0.06	1.38	2.24	0.51	11.9	4.14	52.14	19.34	87.3	21.4	219	33.2	6161	0.08	15.9	51.0
BC14-03 L 478	154	2.2	425	0.21		1.44	0.04	1.31	2.26	0.59	10.2	3.21	41.43	14.36	67.5	15.3	167	25.6	5637	0.07	13.5	45.2
BC14-03 L 484	286	18.5	963	2.05		20.60	0.10	1.39	3.98	0.91	22.1	8.31	90.00	34.01	148.2	36.1	350	51.4	7760	1.07	32.4	43.5
BC14-03 L 485	292	25.9	783	2.04		17.48	0.03	1.15	2.73	0.89	16.1	6.61	77.77	28.86	123.2	31.9	309	42.3	7801	0.70	17.4	23.7
BC14-03 L 486																						
BC14-03 L 488																						
BC14-03 L 492	129	11.2	346	0.76		2.63		0.86	1.20	0.09	7.6	3.03	32.82	11.70	51.2	11.2	110	16.9	7292	0.26	31.7	81.4
BC14-03 S 514																						
BC14-03 S 519	244	9.9	1714	1.53	0.12	34.85	0.31	4.14	8.41	1.30	41.6	12.41	152.08	57.58	252.3	53.4	488	93.4	10829	0.79	207.0	106.9

BC14-03 S 520	388	14.3	1778	4.61	0.03	10.21	0.19	3.47	5.91	0.49	30.9	11.93	149.97	56.14	256.9	56.4	528	89.8	8651	2.39	155.5	162.2
BC14-03 S 525	401	20.8	1379	1.78	0.14	3.71	0.21	2.16	4.33	0.11	27.3	9.40	118.34	45.73	190.7	39.6	357	59.4	11448	0.84	106.5	417.8
BC14-03 S 528	240	7.8	1571	1.83	0.05	24.50	0.17	1.21	3.68	1.62	23.9	8.06	111.59	45.20	216.9	50.1	502	111.2	10124	0.49	114.7	128.1
BC14-03 S 530																						
BC14-03 S 531																						
BC14-03 S 534																						
BC14-03 S 539																						
BC14-03 S 543																						
BC14-03 S 545	166	3.5	973	1.55	0.09	22.90		0.58	2.15	0.87	17.5	6.27	81.40	29.77	144.6	34.2	379	62.5	9320	0.47	82.4	119.7
BC14-03 S 549																						
BC14-03 S 550	180	9.2	443	1.58		4.60		0.51	1.28	0.14	11.5	3.67	43.67	15.07	60.4	14.4	125	19.0	8311	0.77	43.2	87.2
BC14-03 S 554																						
BC14-03 S 560	2030	19.5	10746	2.97	1.29	21.45	1.95	13.78	14.81	3.10	76.6	30.01	408.88	163.96	765.6	183.0	1749	308.2	11085	1.71	96.2	265.6
BC14-03 S 568																						
BC14-03 S 569																						
BC14-03 S 572	173	8.8	770	1.42	0.09	16.19	0.12	0.74	2.76	0.45	15.5	5.19	66.82	23.42	102.2	22.4	202	37.9	8873	1.08	138.4	194.1

BC14-03 S 575	247	10.4	1098	1.43	0.10	13.66	0.12	1.94	4.91	1.39	24.2	7.25	91.04	36.90	167.6	38.3	355	63.3	8259	0.72	79.5	78.0
BC14-03 S 578	252	4.0	1442	4.43		22.41	0.09	1.86	3.53	0.51	24.0	8.91	111.91	46.45	220.7	53.7	552	92.6	9636	1.57	143.2	233.5
BC14-03 S 580	299	24.8	1281	2.33	0.03	17.50	0.33	6.82	10.44	4.67	52.6	14.40	139.52	46.00	172.0	34.9	301	45.6	8542	1.04	51.6	49.4
BC14-03 S 581	67	0.7	79			0.17				0.10	0.3	0.35	5.68	2.64	12.6	3.7	42	8.9	8315	0.04	20.3	125.2
BC14-03 S 584	250	9.6	940	1.74		5.63	0.04	1.22	2.79	0.52	21.3	7.40	90.65	33.17	134.3	31.7	323	41.0	7212	0.55	37.4	66.5
BC14-03 S 586																						
BC14-03 S 588																						
BC14-03 S 589																						
BC14-03 S 590																						
BC14-03 S 591	146	15.9	999	1.11	0.79	5.58	0.80	9.01	10.12	2.11	30.8	10.38	112.50	36.27	143.2	29.7	267	43.9	6181	0.56	58.4	80.2
BC14-03 S 596																						
BC14-03 S 603																						
BC14-03 S 607	122	16.9	1132	1.65	0.23	6.81	0.33	5.53	7.45	0.43	35.8	10.30	123.18	40.88	169.4	34.9	301	46.7	8045	0.88	62.0	50.8

Analysis	P	Ti	Y	Nb	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	Th	U
BC14-04																						

<10% discordant

BC14-04 L 1291																						
BC14-04 L 1292																						
BC14-04 L 1293	162	10.0	542	0.79		6.75	0.13	1.36	3.41	0.25	13.5	4.29	47.87	18.19	83.1	17.2	165	28.9	10612	0.44	82.4	39.6
BC14-04 L 1295	143	5.6	388	1.67		17.82	0.01	0.35	1.24	0.10	7.0	2.53	32.07	12.80	57.1	13.8	128	22.5	11838	0.68	80.8	68.9
BC14-04 L 1296	182	10.5	460	1.63		5.78	0.05	0.72	1.41	0.13	7.8	3.24	40.55	16.35	77.5	17.8	162	27.0	11005	0.80	33.4	33.8
BC14-04 L 1297																						
BC14-04 L 1299	183	12.4	604	2.41		5.79	0.02	0.78	1.49	0.21	11.7	4.81	55.13	20.69	92.2	19.1	179	27.6	9202	1.00	54.0	71.0
BC14-04 L 1300																						
BC14-04 L 1301	131	3.9	412	2.85		25.38		0.28	2.27	0.44	8.5	2.76	33.33	13.79	65.5	15.4	159	24.9	10228	1.46	186.7	241.8
BC14-04 L 1302	276	15.3	948	1.66	0.04	59.49	0.31	4.13	7.98	2.25	32.2	9.04	98.70	33.00	138.8	30.2	299	47.4	8181	0.97	375.1	215.7
BC14-04 L 1303	304	4.8	1305	10.08		17.33	0.07	1.85	4.36	0.22	27.7	9.76	131.96	46.57	210.5	48.8	463	69.0	11171	4.41	182.5	163.9
BC14-04 L 1310	177	12.1	753	1.81		4.49	0.05	1.18	3.88	0.52	18.3	6.60	75.98	26.43	121.2	25.4	229	34.8	8248	0.77	49.7	67.4
BC14-04 L 1312	318	9.7	2197	11.29		17.72	0.33	5.72	10.82	0.32	55.7	19.10	225.59	81.03	344.6	77.8	685	93.8	9959	5.15	261.5	219.9
BC14-04 L 1314																						
BC14-04 L 1316	226	8.4	744	5.93		39.28	0.04	0.92	3.52	0.29	15.8	5.27	71.43	28.04	122.5	29.0	300	41.6	8422	2.46	164.7	119.5

BC14-04 L 1317	156	10.9	362	2.15		19.47	0.04	0.37	1.53	0.39	6.9	2.50	34.14	12.32	60.6	15.2	148	22.4	8874	0.92	46.5	40.7
BC14-04 L 1318	83	2.8	373	3.28		7.52		0.45	0.68	0.11	5.7	2.30	30.92	12.32	60.3	16.2	176	26.5	9082	1.96	131.1	265.2
BC14-04 L 1320	151	4.3	1202	1.20	0.04	7.37	0.46	6.77	9.53	0.66	48.5	12.43	141.71	45.46	176.4	36.5	329	40.2	6662	0.84	175.7	219.5
BC14-04 L 1322																						
BC14-04 L 1326	133	7.1	315	2.00		3.18		0.54	1.23	0.20	6.8	2.63	34.34	11.78	52.3	11.8	128	17.3	7659	0.62	15.0	18.0
BC14-04 L 1328	206	8.1	675	8.24		28.49		1.02	2.42	0.10	12.0	4.18	61.22	21.88	109.8	27.4	294	41.9	8564	3.39	192.2	189.4
BC14-04 L 1330																						
BC14-04 L 1331																						
BC14-04 L 1335																						
BC14-04 L 1338	163	12.7	649	2.53		5.43	0.03	0.74	2.46	0.15	11.3	4.36	56.85	22.38	101.6	22.2	195	32.9	10160	1.07	54.3	70.9
BC14-04 L 1339	131	9.2	318	1.10		7.15	0.02	0.17	1.38	0.03	6.0	2.17	27.29	10.47	49.5	11.9	109	20.0	11683	0.48	83.9	70.7
BC14-04 L 1340	148	10.2	548	1.52	0.04	11.91	0.06	1.23	2.36	0.18	11.7	4.16	51.11	18.56	88.1	19.0	171	30.9	12098	0.60	167.9	86.7
BC14-04 L 1341	183	4.7	1542	1.57	0.03	6.41	0.47	7.81	14.65	1.28	62.8	18.09	185.12	60.41	231.7	44.0	349	56.6	9772	1.00	54.6	51.4
BC14-04 L 1342	233	7.2	1112	2.58		4.86	0.13	2.79	4.23	0.75	30.4	9.47	110.76	40.51	170.0	36.5	312	60.1	10862	1.80	43.3	47.5
BC14-04 L 1345																						
BC14-04 L 1347	250	9.2	1434	1.10		6.81	0.30	5.28	12.38	1.84	47.5	15.45	163.82	54.20	216.4	47.0	406	62.9	8926	0.46	46.4	24.7

BC14-04 L 1352																						
BC14-04 L 1357	344	3.6	738	2.81		3.11	0.02	0.59	2.13	0.12	17.7	6.26	76.75	25.62	109.5	24.7	228	33.4	10650	1.36	184.3	357.1
BC14-04 L 1358	202	10.4	591	1.94		4.63	0.01	1.40	2.10	0.15	13.8	4.83	56.31	20.93	92.8	21.1	198	29.8	7734	1.00	34.8	30.5
BC14-04 L 1360	257	9.6	745	2.80		46.90	0.17	1.62	4.77	1.23	23.8	5.92	80.07	28.24	121.9	25.5	269	38.9	8186	1.61	191.6	209.2
BC14-04 L 1361	107	6.6	446	0.95		8.78	0.01	0.41	2.14	0.00	11.6	3.43	40.45	15.78	68.6	18.3	174	25.1	9121	0.39	129.5	102.8
BC14-04 L 1362																						
BC14-04 L 1364																						
BC14-04 L 1365	236	19.3	603	2.06	0.49	15.27	0.17	3.25	3.75	0.96	16.1	5.28	63.77	22.12	89.6	20.4	222	28.9	7645	0.77	77.6	69.7
BC14-04 L 1368	227	17.2	537	1.36		4.61	0.08	1.41	2.37	0.50	13.9	4.36	54.32	20.53	88.4	21.7	214	28.5	7934	0.57	20.1	17.7
BC14-04 L 1369	215	20.4	401	0.94		2.88		0.76	1.39	0.35	8.5	3.25	40.01	14.30	67.6	15.5	167	21.8	7509	0.33	12.1	12.6
BC14-04 L 1372	130	6.3	530	1.65		13.86	0.06	0.75	2.13	0.21	11.3	4.25	49.72	19.28	80.9	19.4	204	29.0	8085	0.80	73.4	63.6
BC14-04 L 1373	153	11.0	333	1.36		12.43	0.07	0.37	1.22	0.14	6.9	2.38	28.55	11.85	52.6	12.4	127	17.2	8042	0.75	41.7	41.6
BC14-04 L 1377	137	10.3	406	1.39		10.45	0.02	1.08	2.65	0.16	10.2	3.38	42.46	13.93	64.5	14.1	150	21.4	7877	0.60	134.9	88.0
BC14-04 L 1379	91	2.9	165	1.15		4.55	0.01		0.25	0.03	1.8	0.80	11.56	4.67	24.6	7.7	96	14.5	9677	1.14	88.8	220.7
BC14-04 S 6189	14.1	542	2.12		4.36	0.02	0.75	2.09	0.23	9.9	3.70	49.78	18.23	78.9	18.6	184	26.3	9441	1.14	39.4	56.8	
BC14-04 S 8118	11.3	495	2.10	0.11	64.68	0.19	2.50	4.86	1.68	21.0	5.77	55.80	17.43	66.3	14.5	149	21.9	10314	1.34	454.2	334.5	

BC14-04 S 20	172	13.2	550	2.44		4.91	0.01	0.66	1.78	0.23	12.5	3.90	49.95	18.30	83.8	19.4	189	28.9	9871	1.07	27.0	25.0
BC14-04 S 21																						
BC14-04 S 23																						
BC14-04 S 24																						
BC14-04 S 28	232	5.2	1167	1.04		6.88	0.08	2.55	5.28	0.73	33.2	10.62	120.53	40.27	166.5	39.8	386	46.2	8488	0.68	125.9	141.8
BC14-04 S 31	307	12.2	2305	3.25	0.03	14.55	0.69	12.33	19.12	1.11	75.5	22.81	262.43	88.87	342.9	74.2	726	85.6	8458	2.23	278.6	272.9
BC14-04 S 43	251	9.8	2208	3.55	0.11	14.77	0.20	5.13	9.99	0.67	56.1	19.09	209.52	79.22	317.6	66.7	594	91.6	11265	2.03	277.2	250.7
BC14-04 S 50	161	7.9	627	0.71	0.01	7.16	0.08	2.07	4.15	1.18	19.4	5.98	64.58	22.29	92.6	20.4	203	29.6	9100	0.56	130.4	209.1
BC14-04 S 52	297	8.8	1618	4.85	0.01	15.09	0.26	4.35	8.37	0.85	42.1	13.68	162.51	58.53	245.1	56.0	519	67.0	8851	2.33	138.0	170.5
BC14-04 S 53	177	12.4	591	2.23		11.20	0.05	0.98	2.21	0.26	12.8	4.45	54.91	21.34	90.2	19.1	207	27.0	9630	1.17	74.7	67.8
BC14-04 S 59	259	4.7	993	4.75		10.52	0.19	2.19	4.48	0.23	24.4	8.91	99.61	34.79	153.0	35.3	365	44.6	9063	1.50	75.7	64.2
BC14-04 S 64	156	6.6	301	1.66		30.92	0.11	2.82	4.45	1.40	18.4	3.59	35.75	10.34	35.9	8.6	88	10.4	7896	0.86	185.8	247.5
BC14-04 S 65	291	5.9	2062	2.63	0.08	18.34	0.86	12.64	16.51	1.51	74.9	22.05	232.40	76.86	294.8	62.3	580	68.1	7073	1.31	387.9	203.2
BC14-04 S 67	310	3.8	930	1.24		3.34	0.08	1.73	4.95	0.44	24.3	7.66	93.86	34.19	135.0	31.6	311	39.3	6444	0.79	80.0	167.4
BC14-04 S 68	283	12.9	2143	4.62	0.12	16.44	0.75	9.01	16.40	0.82	67.2	20.14	232.40	77.13	313.2	68.8	694	76.0	7345	2.56	281.7	308.5
BC14-04 S 74	163	10.0	643	1.14		4.81	0.11	1.75	3.02	0.38	15.6	5.32	62.46	23.12	96.7	19.9	213	27.5	8020	0.47	60.2	41.8
BC14-04 S 77																						
BC14-04 S 78	506	15.8	950	2.00	14.73	56.98	2.84	14.64	7.60	1.74	33.1	8.67	95.52	33.78	136.9	31.9	313	42.5	7533	1.19	141.3	110.7

BC14-04 S 80	291	12.1	1293	2.35	0.09	64.59	0.46	7.33	11.68	2.83	50.1	13.83	140.01	46.27	187.7	41.6	394	52.5	6586	0.97	348.5	185.5
BC14-04 S 86	193	4.8	872	1.15		7.24	0.04	1.67	3.30	0.53	19.2	6.60	83.27	31.79	131.5	30.1	303	38.1	8680	0.43	99.3	130.4
BC14-04 S 90	139	6.5	510	2.24		19.06	0.05	0.89	2.08	0.32	13.2	4.06	41.87	17.75	71.7	14.5	134	22.8	11861	0.93	164.6	165.9
BC14-04 S 91																						
BC14-04 S 93	218	8.8	1088	1.72	0.08	5.80	0.22	3.28	6.41	0.72	31.3	10.29	106.23	37.96	163.1	36.7	343	48.8	9823	0.67	39.1	25.9
BC14-04 S 96	162	4.7	1085	2.48		14.81	0.35	5.39	8.33	0.32	31.3	9.49	117.28	38.16	172.9	36.6	348	48.9	10233	1.38	179.8	126.5
BC14-04 S 97	116	3.9	419	1.50		25.19	0.10	2.64	3.63	1.12	12.2	4.20	38.69	13.15	55.7	14.5	151	24.5	10348	0.68	158.4	224.0
BC14-04 S 100	210	4.2	1236	1.43	0.02	20.02	0.54	9.90	12.46	1.56	42.6	12.06	134.46	43.59	167.8	38.0	357	46.1	7662	0.79	149.9	76.7
BC14-04 S 101	131	4.4	411	4.43		9.91	0.04	1.10	1.10	0.13	7.9	2.97	34.99	13.73	64.7	17.2	182	27.5	10352	2.20	67.0	103.9
BC14-04 S 104																						
BC14-04 S 109	216	17.3	1042	1.28		10.70	0.23	4.34	8.39	1.02	34.5	10.30	111.72	37.41	149.9	31.5	307	37.3	7633	0.44	104.1	55.3
BC14-04 S 112																						
BC14-04 S 114	194	6.9	658	3.07		13.16	0.02	1.27	3.10	0.14	14.6	5.78	64.43	23.78	97.3	23.2	232	28.6	8891	1.29	130.4	112.8
BC14-04 S 115	95	4.2	171	0.29		2.26	0.01	0.06	0.08		2.0	1.04	13.70	5.94	27.3	7.6	92	13.6	9817	0.29	33.9	171.6
BC14-04 S 118																						
BC14-04 S 124	190	7.3	817	2.57		11.06	0.24	2.52	4.90	0.53	23.0	7.23	81.93	27.89	111.3	24.6	254	30.7	9078	1.12	151.2	119.3

BC14-04 S 126	285	22.8	985	2.47		53.37	0.23	5.61	10.45	2.54	30.1	9.28	97.67	35.09	143.2	33.0	349	44.7	7506	0.85	338.4	219.3
BC14-04 S 128																						
BC14-04 S 130	309	8.0	676	1.18		6.75	0.12	2.44	4.28	0.49	20.9	5.54	64.32	22.82	96.6	22.0	224	31.2	8922	1.04	173.0	278.2
BC14-04 S 134	158	8.2	463	3.77	0.01	19.51	0.09	0.77	1.47	0.22	7.5	3.20	41.98	15.51	72.5	19.3	210	31.5	10433	1.64	88.6	194.6
<10% discordant																						
BC14-04 L 1294	231	10.8	942	5.05		10.72	0.04	0.78	3.40	0.34	19.0	6.39	87.69	33.18	145.1	31.5	277	47.3	9970	1.68	96.7	123.5
BC14-04 L 1298	208	3.1	523	1.43		12.40	0.07	1.15	1.87	0.21	12.9	4.12	49.71	19.11	81.5	17.6	165	27.1	9215	0.63	60.9	45.9
BC14-04 L 1304	239	6.8	1016	7.41		16.81	0.09	1.74	5.14	1.20	28.4	8.64	101.38	38.37	159.7	35.3	331	48.4	10752	3.44	127.3	134.1
BC14-04 L 1305	213	8.3	855	5.98		13.42	0.04	1.01	3.76	0.24	20.2	6.57	83.10	31.41	140.3	29.8	285	43.9	10239	2.10	84.5	78.7
BC14-04 L 1309																						
BC14-04 L 1313																						
BC14-04 L 1315																						
BC14-04 L 1323																						
BC14-04 L 1324	345	18.0	2079	4.43	0.16	14.48	0.82	11.40	20.69	4.59	86.7	24.17	246.92	76.49	294.9	64.2	583	71.9	7307	2.57	391.5	369.8
BC14-04 L 1327	225	9.0	599	3.77		6.16	0.08	1.72	4.31	1.32	21.8	6.18	68.53	23.21	95.8	21.5	218	28.9	7857	1.48	193.7	223.5
BC14-04 L 1329																						

BC14-04 L 1333	234	6.1	1136	2.29	0.09	20.32	0.47	5.97	11.24	1.50	45.1	12.91	133.09	43.43	163.8	35.5	336	44.7	6763	0.88	377.8	224.2
BC14-04 L 1334	254	8.9	1129	4.23		11.92	0.16	3.87	7.09	0.45	33.4	11.30	122.30	42.79	173.1	40.2	370	48.5	7758	1.62	163.6	197.0
BC14-04 L 1337	296	8.7	986	8.02	0.04	13.25	0.05	0.83	2.94	0.35	20.7	6.90	88.16	33.31	153.4	33.9	304	51.5	9491	2.54	121.7	145.2
BC14-04 L 1344																						
BC14-04 L 1350																						
BC14-04 L 1355	199	3.8	728	1.35		4.02	0.03	2.00	4.05	0.70	21.3	6.62	71.44	25.58	111.4	24.4	232	35.0	7320		21.7	18.1
BC14-04 L 1356																						
BC14-04 L 1359																						
BC14-04 L 1363	75	6.1	207	1.98		4.21	0.06	0.18	0.59	0.19	2.5	1.41	15.70	6.65	34.9	9.9	120	19.3	9631	1.71	47.3	290.3
BC14-04 L 1366																						
BC14-04 L 1367	216	8.6	629	2.26		34.77	0.06	2.03	3.42	0.51	17.5	5.86	64.07	22.70	93.8	23.4	231	30.9	8502	1.21	177.2	200.7
BC14-04 L 1370	62	6.8	201	3.08	0.08	3.27	0.07	0.65	0.44	0.34	3.0	1.22	17.17	7.08	34.9	10.6	140	25.7	10236	1.69	34.1	393.5
BC14-04 L 1371																						
BC14-04 L 1376																						
BC14-04 S 9266	18.1	1409	6.38	0.17	20.14	0.45	5.85	12.85	17.20	52.1	13.49	150.58	51.50	206.2	49.2	471	68.3	10718	2.88	524.3	744.4	
BC14-04 S 12182	21.4	781	1.91	0.07	17.37	0.32	4.89	9.36	2.35	33.3	9.85	92.65	31.21	111.3	24.8	232	30.1	8598	1.07	154.9	159.6	

BC14-04 S 14																					
BC14-04 S 15218	6.3	1596	1.46	0.12	4.48	0.36	6.78	9.80	3.97	50.3	18.00	190.33	64.78	228.4	49.0	444	80.1	9048	0.81	139.4	274.9
BC14-04 S 16																					
BC14-04 S 19199	8.4	913	2.34	0.19	14.46	0.63	7.32	9.99	3.16	35.1	10.69	101.50	34.10	129.6	28.8	261	38.4	10753	2.21	189.2	325.0
BC14-04 S 25																					
BC14-04 S 29																					
BC14-04 S 34																					
BC14-04 S 35																					
BC14-04 S 36																					
BC14-04 S 37243	9.1	675	1.61	0.00	23.14	0.16	2.12	5.03	2.66	21.2	6.51	67.17	22.16	97.2	24.9	281	39.0	8211	0.47	224.0	230.5
BC14-04 S 39255	4.5	960	1.38	0.02	21.99	0.18	2.45	5.60	2.61	30.3	8.61	99.52	33.78	138.9	33.1	344	43.2	9183	0.50	134.4	264.2
BC14-04 S 41242	19.4	1709	3.69	2.07	10.97	1.11	11.98	14.54	4.83	57.2	16.23	170.70	53.17	229.1	43.5	405	74.7	11647	2.48	224.3	533.2
BC14-04 S 42																					
BC14-04 S 45378	14.8	2272	2.22	0.26	11.48	0.67	6.35	12.57	7.65	61.8	19.72	209.56	72.49	309.9	65.0	615	103.2	9593	1.62	299.9	628.0
BC14-04 S 54																					
BC14-04 S 5880	6.2	129	0.36		6.54	0.02	0.43	1.53	0.19	3.6	1.31	12.51	4.30	17.8	3.9	49	7.5	9097	0.09	70.9	362.8
BC14-04 S 61257	16.0	974	2.74	0.02	70.04	0.25	5.15	9.72	3.07	35.7	9.79	103.64	34.37	136.3	32.5	339	44.2	7647	1.33	365.6	250.3
BC14-04 S 62160	7.7	869	2.51	0.04	38.52	0.35	3.59	8.06	4.08	26.5	7.34	77.94	27.65	125.0	33.6	401	61.2	8388	0.43	245.4	411.9
BC14-04 S 63																					
BC14-04 S 66																					
BC14-04 S 69349	16.7	2549	5.12	0.61	12.05	0.67	9.33	15.78	0.29	80.2	23.68	256.03	88.53	381.3	88.2	849	107.3	7460	2.02	744.9	593.1

BC14-04 S 70	534	12.1	1568	4.91	0.35	6.06	0.29	6.91	25.10	17.56	140.4	30.99	249.85	61.98	195.6	40.2	367	43.5	8796	1.46	466.1	558.1
BC14-04 S 72																						
BC14-04 S 76	103	5.8	727	2.92	0.16	8.76	0.03	0.99	1.70	0.54	12.1	4.79	59.85	23.71	112.0	27.0	293	43.2	8956	1.46	255.5	385.3
BC14-04 S 82	104	6.1	936	1.14	0.11	8.96	0.00	2.41	3.59	0.76	17.7	7.01	81.72	31.18	140.7	31.6	299	59.9	11431	0.90	192.7	294.7
BC14-04 S 83																						
BC14-04 S 84																						
BC14-04 S 92																						
BC14-04 S 94	149	6.4	565	3.24	0.01	5.85	0.03	0.68	2.05	0.40	9.9	4.24	47.83	19.46	91.1	22.0	221	35.7	12685	2.02	50.8	88.8
BC14-04 S 95	202	11.1	758	2.29		30.13	0.07	0.99	3.95	0.66	20.5	6.56	68.61	27.04	112.2	25.6	249	37.9	9862	1.25	149.1	173.2
BC14-04 S 102	181	14.9	480	2.32	0.04	6.56	0.09	0.83	1.59	0.49	7.0	2.78	40.25	15.37	80.0	22.5	263	39.2	9670	2.09	178.6	304.3
BC14-04 S 103																						
BC14-04 S 106																						
BC14-04 S 107	178	4.4	882	0.78		5.20	0.06	1.24	4.39	0.49	23.3	6.96	86.79	31.30	129.0	30.5	307	39.2	9054	0.50	77.7	192.5
BC14-04 S 110																						
BC14-04 S 113	160	6.2	1001	4.57	0.05	7.53	0.12	3.33	3.86	0.23	23.0	8.42	100.90	39.89	153.7	33.2	337	45.0	9285	2.68	122.7	269.4
BC14-04 S 116	175	9.9	792	0.70		7.50	0.13	2.45	5.27	2.11	25.7	7.03	81.97	26.76	114.2	31.2	317	42.1	7757	0.22	108.7	174.2
BC14-04 S 119	170	7.7	533	1.74	0.04	10.32	0.16	1.53	3.11	0.12	13.4	4.13	48.62	19.55	78.1	19.2	202	24.8	9199	0.79	151.2	85.2
BC14-04 S 120																						

BC14-04 S 121	247	11.4	1850	3.08	0.09	12.46	0.47	7.43	13.69	0.84	60.8	18.11	192.95	69.50	282.7	60.1	523	68.0	8705	1.73	183.9	213.1
BC14-04 S 122	285	13.6	1094	4.72		33.11	0.10	2.82	14.13	9.18	81.8	16.87	131.88	38.79	146.5	35.3	341	45.0	9133	2.56	256.0	416.2
BC14-04 S 123	294	8.8	1017	2.07		8.33	0.23	1.58	5.41	2.88	27.0	8.53	93.74	33.42	144.2	35.2	357	51.0	7683	1.08	171.7	383.6
BC14-04 S 129	190	7.9	936	1.54	0.01	4.59	0.15	3.04	4.28	1.13	23.8	8.24	89.80	31.95	132.4	30.1	300	38.9	8524	0.43	39.1	50.0
BC14-04 S 131																						
BC14-04 S 132	277	9.5	1071	3.47	0.85	41.60	0.53	5.24	6.19	1.64	27.6	8.52	112.65	36.76	155.8	35.9	362	49.9	8881	1.65	290.3	344.6
BC14-04 S 133	235	5.9	757	6.10	0.01	30.19	0.06	2.04	3.43	0.71	20.2	6.09	71.74	26.17	113.4	28.8	304	41.7	9325	2.73	160.7	169.4

Analysis	**P**	**Ti**	**Y**	**Nb**	**La**	**Ce**	**Pr**	**Nd**	**Sm**	**Eu**	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**	**Hf**	**Ta**	**Th**	**U**
BC14-05																						
<10% discordant																						
BC14-05 L 148	162	3.3	309	0.33		1.53		0.11	0.51	0.05	2.8	1.54	22.78	9.39	48.2	13.4	153	25.6	10022	0.10	8.9	34.9
BC14-05 L 151	131	8.6	582	0.65	0.03	8.23	0.13	2.66	4.12	1.23	20.5	5.93	57.65	19.85	84.3	19.3	203	27.9	8109	0.27	48.3	111.3
BC14-05 L 154	250	18.8	619	1.46	0.04	8.86	0.00	0.63	1.90	0.26	15.6	5.41	60.98	21.88	94.7	23.1	236	34.6	7922	0.49	26.8	41.4
BC14-05 L 155	76	9.1	527	2.37		5.82		1.31	2.31		12.0	3.97	49.50	18.99	71.7	19.2	175	26.3	8627	1.30	60.4	151.4
BC14-05 L 156	439	6.4	610	1.11	0.72	6.42	0.04	1.58	1.57		12.4	4.32	52.08	21.94	93.1	22.9	247	32.1	9070	1.08	73.5	224.7

BC14-05 L 157	244	2.3	766	1.77		31.92				0.97	10.7	6.66	77.61	30.05	119.8	27.8	323	38.7	8145	0.04	78.6	146.7
BC14-05 L 166	703	17.3	2077	0.95		5.61	0.34	6.03	15.24	1.23	64.4	19.45	221.40	74.92	313.4	71.5	668	87.8	8288	0.71	119.3	147.2
BC14-05 L 167	541	7.8	2066	1.32		5.02	0.14	2.01	6.31	0.94	42.5	15.72	210.57	76.76	329.3	77.5	751	104.0	9191	0.89	74.8	191.2
BC14-05 L 180	215	2.9	760	2.24	0.73	17.42	0.22	2.16	3.89	0.12	16.9	5.41	75.69	27.53	122.2	26.7	276	38.5	9421	1.52	148.1	259.1
BC14-05 L 185	313	10.2	1072	1.87		31.72	0.27	6.54	12.29	3.61	42.7	11.31	118.34	37.67	160.0	37.7	354	45.6	7088	0.82	146.9	209.1
BC14-05 L 195	227	48.2	709	2.74		27.38	0.12	0.92	2.53	0.48	14.2	4.84	67.02	25.51	119.5	30.4	341	51.8	8391	1.70	49.0	108.6
BC14-05 L 196	263	2.7	995	2.40		12.25	0.06	1.07	3.89	0.63	26.3	8.89	102.32	35.33	153.3	36.3	361	50.0	10268	1.66	125.0	351.1
BC14-05 S 206	94	8.6	581	0.56		5.75	0.12	2.21	2.86	1.34	13.4	3.82	50.52	19.20	91.4	24.0	287	48.5	7727	0.27	86.0	100.3
BC14-05 S 213	120	6.5	216	1.71	0.22	20.35	0.17	0.84	0.82	0.19	3.5	1.28	17.79	7.66	35.7	10.7	129	21.3	9817	0.66	56.6	123.2
BC14-05 S 219	175	5.1	605	0.96		13.31	0.00	1.33	3.24	1.20	18.4	5.11	60.27	21.19	89.2	22.4	228	31.9	8093	0.45	80.0	133.5
BC14-05 S 221	145	9.0	708	0.81		10.85	0.09	2.84	4.53	0.93	19.1	6.08	68.50	23.80	105.8	27.5	281	36.7	7955	0.35	130.8	216.0
BC14-05 S 222	159	13.7	451	2.01		7.72	0.11	1.92	2.28	0.39	12.3	3.79	46.67	15.95	68.5	17.3	183	23.3	8173	1.04	61.1	108.4
BC14-05 S 223	224	6.3	934	1.59		5.80	0.06	1.10	3.59	0.49	21.0	6.88	91.40	35.48	149.4	36.4	401	50.6	7054	0.76	89.2	195.7
BC14-05 S 224	475	12.6	1524	2.59		25.49	0.20	3.19	6.13	1.62	31.8	11.21	150.80	53.72	242.0	60.3	640	82.9	7220	1.08	106.1	133.2
BC14-05 S 227	211	5.6	739	2.22		15.94	0.06	1.84	3.88	0.34	16.1	6.14	75.53	27.00	112.6	29.2	293	36.0	7724	1.29	120.0	255.4
BC14-05 S 229	310	12.3	1060	3.65	0.01	31.68	0.18	3.31	5.71	1.95	32.0	9.19	117.15	41.60	161.7	40.0	408	49.3	7242	1.44	87.6	90.0

BC14-05 S 230	392	8.8	2742	3.15	0.75	25.64	0.77	9.99	16.43	6.52	82.3	25.88	311.65	101.89	399.1	88.9	854	113.4	5918	0.85	195.1	232.3
BC14-05 S 232	118	3.6	453	2.00	0.05	5.60	0.03	0.66	1.68	0.50	9.0	3.46	42.56	16.19	73.8	19.4	202	26.2	7794	0.75	19.1	103.2
BC14-05 S 233	202	4.5	883	3.03		7.21	0.03	1.25	3.22	0.32	15.9	6.65	81.35	31.53	139.3	36.3	361	47.5	7493	1.18	55.4	222.6
BC14-05 S 234	143	5.0	304	0.23		4.53	0.01	0.09	0.81	0.43	4.4	1.79	26.56	10.65	48.6	13.1	152	21.4	7996	0.18	11.1	26.9
BC14-05 S 236	308	26.9	1088	2.00		30.81	0.23	2.93	4.66	1.24	27.6	9.26	108.43	41.71	175.7	40.3	442	56.0	7908	0.65	72.5	59.8
BC14-05 S 237	429	15.7	909	0.81		4.17	0.03	1.26	3.81	0.25	21.4	7.28	90.61	33.52	145.6	35.4	344	44.7	8817	0.48	50.1	118.4
BC14-05 S 241	179	10.1	708	1.87		3.02	0.05	1.39	2.62	0.60	13.6	5.52	69.97	26.59	106.5	27.4	287	39.9	6687	0.87	54.1	128.3
BC14-05 S 244	313	21.8	2452	3.06	0.01	32.16	0.49	8.53	15.91	4.88	72.9	22.34	261.29	91.55	375.6	82.6	754	118.2	8057	0.86	94.1	112.9
BC14-05 S 245	201	7.9	2431	0.89	0.15	8.49	0.25	6.79	14.82	2.63	69.4	21.16	249.77	87.32	356.0	70.3	576	108.7	8073	0.39	84.3	132.1
BC14-05 S 246	198	11.3	460	1.55		17.95	0.00	0.62	1.73	0.38	10.3	3.45	41.56	16.30	71.6	16.8	166	25.8	9732	0.62	59.5	97.9
BC14-05 S 247	430	15.6	2266	4.56	0.05	25.31	0.51	6.61	13.61	3.11	65.1	21.10	250.67	86.39	345.4	78.1	730	101.6	8897	1.72	173.9	188.6
BC14-05 S 250	120	7.0	254	0.42		3.72	0.02	0.26	0.72	0.41	5.0	1.85	21.45	8.47	39.3	10.0	119	19.5	6901	0.27	20.2	66.8
BC14-05 S 257	133	5.3	521	3.41		31.92	0.03	0.83	1.66	0.50	7.7	3.44	41.78	16.69	82.6	24.8	303	48.1	8679	1.40	112.5	337.7
BC14-05 S 259	146	12.9	494	1.60	0.06	25.00	0.52	7.81	9.79	1.19	27.3	6.90	61.46	17.15	67.6	15.2	156	20.0	6353	0.61	197.5	210.6
BC14-05 S 260	281	7.8	894	3.43		33.80	0.12	1.99	5.04	1.66	22.5	7.50	90.88	31.25	135.3	34.3	369	48.6	7738	1.62	138.5	270.0
BC14-05 S 262	177	2.8	584	1.21	0.05	2.47	0.02	0.37	1.38	0.27	8.5	3.50	48.57	19.32	91.0	25.3	299	42.1	8270	0.20	38.6	72.5

BC14-05 S 264	479	9.8	1142	2.09	0.02	4.98	0.05	0.98	3.73	0.18	25.3	8.22	108.53	41.87	183.0	42.9	452	60.5	8592	0.94	55.8	155.0
BC14-05 S 266	751	11.9	1768	2.66	0.06	11.56	0.12	1.87	4.39	0.58	34.8	13.78	171.36	63.55	285.8	71.8	758	95.3	8900	1.50	95.1	342.3
BC14-05 S 267	8272	12.2	893	3.15	185.28	518.71	75.80	387.36	90.42	7.65	93.3	13.32	113.23	30.34	114.3	27.3	299	41.1	7934	1.41	62.4	119.8
BC14-05 S 270	149	4.4	497	1.57	0.25	9.31	0.06	0.95	2.10	0.58	8.1	3.20	43.22	16.21	74.5	19.3	223	32.2	7542	0.83	95.6	232.7
BC14-05 S 271	233	15.9	637	2.15		28.24	0.05	1.21	2.47	0.87	17.4	5.49	65.99	23.57	99.9	24.4	252	32.7	8049	0.66	67.2	117.9
BC14-05 S 274	128	5.9	432	1.19		2.61		0.22	0.66	0.19	6.6	2.79	39.92	14.59	62.9	16.3	163	24.5	9054	0.71	22.2	60.9
BC14-05 S 276	662	11.1	2272	4.00	3.64	39.31	1.82	12.29	9.76	0.78	46.9	16.97	219.35	82.66	357.0	83.6	833	119.7	10350	1.70	150.3	236.5
BC14-05 S 277	238	12.7	737	3.07	0.04	35.28	0.09	1.68	4.33	1.27	19.7	5.88	74.18	25.03	113.4	27.9	293	42.0	8238	1.25	171.0	162.1
BC14-05 S 278	204	10.8	1005	3.37	0.39	14.87	0.16	2.21	3.13	0.86	23.4	7.81	95.47	35.38	150.1	37.7	367	54.0	8442	1.40	119.3	192.9
BC14-05 S 279	647	13.0	1976	2.68	0.05	8.46	0.12	3.92	8.10	2.12	46.6	16.01	212.56	75.64	318.1	75.6	742	95.7	8846	1.34	83.2	160.9
BC14-05 S 281	265	17.8	823	1.42		8.95		1.39	2.72	0.19	17.0	5.95	80.71	30.05	137.4	32.1	348	42.7	8464	0.64	46.8	76.0
BC14-05 S 283	637	13.0	1326	1.93		14.38	0.02	1.61	3.87	1.61	23.3	9.73	127.82	48.91	219.1	56.6	628	86.5	8280	0.91	24.6	69.9
BC14-05 S 284	645	13.0	1124	1.35	0.04	7.41	0.10	1.58	4.56	0.87	24.9	9.42	110.49	41.02	181.8	44.0	481	59.8	8871	0.67	45.1	135.5
BC14-05 S 285	169	3.6	221	0.79		3.06		0.36	1.30	0.06	9.5	2.83	26.71	7.94	25.5	5.6	51	5.3	10458	0.51	36.2	190.8

>10% discordant

BC14-05 L 147	230	7.8	1585	1.90		7.24		0.43	1.98	0.72	19.9	7.44	116.09	49.58	257.2	68.2	746	116.2	8692	1.00	70.5	187.0

BC14-05 L 152	162	11.2	1060	1.78		7.85	0.14	3.14	5.41	1.59	26.4	9.00	105.62	37.07	154.5	37.6	393	53.0	7089	0.72	64.7	171.8
BC14-05 L 153	116	3.1	257	2.03		6.67	0.10	0.51	0.16	0.25	2.5	1.17	19.04	7.52	39.7	12.5	140	24.6	9377	1.09	45.2	347.2
BC14-05 L 168	247	8.7	1101	3.51		13.76	0.15	2.89	6.12	1.58	28.5	9.50	115.38	38.91	179.0	40.3	395	55.3	9071	1.99	105.4	232.2
BC14-05 L 181	217	9.2	777	1.79		14.99	0.06	0.90	3.04	0.61	14.0	5.15	69.48	27.07	123.6	30.6	317	49.1	9633	1.52	46.6	261.3
BC14-05 L 182	394	13.1	1115	0.86	0.03	5.08	0.06	1.35	5.53	0.64	32.3	9.81	119.76	41.61	164.8	38.9	397	52.6	9156	0.51	68.8	119.5
BC14-05 L 184	348	24.2	1843	1.95		24.70	0.13	2.60	6.67	3.49	44.8	15.00	182.62	65.85	282.1	64.5	645	91.8	6303	0.42	54.6	37.3
BC14-05 L 186	6718		1540		42.75	186.37	20.85	171.50	55.01		51.6	9.32	190.77	61.30	244.4	53.8	493	82.8	9379		74.4	157.1
BC14-05 S 203	184	12.0	1149	2.30	0.10	49.40	0.36	7.23	11.65	2.70	44.1	12.69	120.38	40.11	161.9	34.8	330	49.2	9866	1.24	213.0	211.2
BC14-05 S 207	291	9.9	1994	3.67	0.18	51.97	0.35	5.97	9.84	3.21	56.7	16.63	190.56	67.11	292.2	67.9	654	100.0	8209	1.60	147.3	156.0
BC14-05 S 208	862	7.5	2187	0.94	0.02	2.95	0.11	1.75	6.95	0.53	39.2	16.09	211.73	78.54	339.3	79.7	789	111.6	10708	0.67	64.2	297.8
BC14-05 S 210	131	6.6	649	1.91	0.09	42.39	0.18	1.72	2.37	1.25	13.0	4.05	53.40	21.21	101.3	28.7	353	58.1	8757	0.66	323.0	294.8
BC14-05 S 211	192	13.1	727	3.38		8.20	0.07	1.11	2.89	0.38	16.2	5.56	70.96	25.66	111.3	28.4	285	43.0	9022	1.70	74.3	122.6
BC14-05 S 215	427	10.9	2464	9.42	1.44	31.41	0.79	6.74	12.74	3.73	68.2	22.13	263.13	89.67	369.2	87.6	856	112.4	8059	3.12	751.6	739.5
BC14-05 S 218	304	9.8	946	2.53	0.03	6.21	0.08	1.56	2.80	0.29	18.8	6.49	93.05	35.16	143.5	34.8	366	46.3	8523	1.35	51.8	121.5
BC14-05 S 228	267	37.0	1852	3.16	0.29	63.18	0.35	4.75	8.63	2.76	40.8	13.80	169.40	62.06	269.6	58.0	551	101.6	8834	1.07	219.4	237.3
BC14-05 S 231	256	34.9	873	1.58	0.02	14.62	0.16	2.34	5.04	0.76	27.5	8.34	91.31	33.10	132.6	31.1	327	37.6	7862	0.98	94.8	140.0

BC14-05 S 238	204	25.5	1056	6.98	0.34	24.00	0.79	6.79	7.90	3.41	31.2	9.65	108.35	36.88	155.0	39.0	424	54.1	7258	2.12	238.7	755.5
BC14-05 S 240																						
BC14-05 S 243	199	6.3	798	1.07	0.02	9.19	0.13	2.68	3.91	1.24	18.1	6.03	68.66	25.86	120.2	29.7	327	61.4	9249	0.34	129.8	156.1
BC14-05 S 248	390	9.7	1399	1.64	0.09	7.20	0.12	1.96	3.86	0.64	25.9	9.43	130.13	49.55	211.7	51.7	500	72.8	9624	0.89	106.2	234.8
BC14-05 S 258	273	117.2	1838	2.30	0.09	22.03	0.30	3.00	6.83	1.51	40.1	13.55	175.31	64.11	292.0	65.2	615	102.2	7935	0.95	101.2	242.1
BC14-05 S 261	4692	9.8	1246	4.23	14.73	86.14	7.76	41.33	14.57	2.79	36.0	10.38	119.65	43.91	189.0	47.6	521	68.4	6988	1.69	263.8	457.2
BC14-05 S 265	407	10.4	1639	2.93	0.04	27.81	0.16	2.96	6.47	1.43	36.3	13.07	168.12	60.29	264.0	64.9	687	83.8	7555	0.92	98.4	125.8
BC14-05 S 280	82	2.2	213	0.79		4.53		0.05	0.78	0.10	3.7	1.44	18.30	7.66	36.6	9.8	112	16.3	8373	0.56	24.2	121.2
BC14-05 S 282	1600	18.0	3100	4.16	12.54	96.08	4.95	27.27	21.54	5.04	83.4	28.67	323.57	115.31	501.5	124.5	1340	166.5	8055	1.04	328.3	196.8
BC14-05 S 286	294	26.0	1369	2.98	0.36	34.76	0.38	4.97	9.15	2.67	37.2	12.42	145.73	52.69	214.5	50.8	542	63.7	6894	1.27	77.9	104.0

APPENDIX 1D:

WSU zircon LA-ICPMS U-Pb geochronology

sample name	238U 206Pb	1 sigma % error	207Pb 206Pb	1 sigma % error	Th U	206/238 age	1 sigma abs err	207/206 age	1 sigma abs err	
10RL774										
<10% discordant										
10RL774_3a3.3342		0.03	0.1057	0.00	128.40	1690.9	37.2	1726.9	8.5	
10RL774_5a3.4481		0.02	0.0996	0.01	125.40	1641.6	36.1	1616.7	9.4	
10RL774_6a3.2777		0.03	0.1065	0.01	124.40	1716.5	38.0	1739.5	9.6	
10RL774_8a2.2561		0.03	0.1582	0.01	122.40	2365.1	50.5	2436.3	8.8	
10RL774_10a		3.4348	0.03	0.1013	0.01	120.40	1647.2	37.1	1648.3	12.4
10RL774_11a		3.1341	0.02	0.1028	0.01	118.40	1785.2	38.4	1675.9	16.8
10RL774_13a		3.5805	0.02	0.1046	0.01	116.40	1587.8	33.0	1707.2	14.5
10RL774_14a		3.2723	0.02	0.1037	0.01	115.40	1719.0	35.6	1690.7	15.5
10RL774_15a		4.0788	0.02	0.0972	0.01	114.40	1413.5	31.5	1571.1	19.2
10RL774_16a		3.4708	0.02	0.1044	0.01	113.40	1632.1	34.9	1704.1	15.2
10RL774_17a		2.3118	0.02	0.1577	0.01	112.40	2317.3	46.2	2430.8	12.3
10RL774_18a		3.5141	0.02	0.1050	0.01	111.40	1614.3	33.6	1713.5	13.6
10RL774_20a		3.7043	0.02	0.0973	0.01	109.40	1540.6	32.7	1573.2	15.6
10RL774_21a		3.3994	0.02	0.1031	0.01	108.40	1662.3	34.8	1680.4	14.4
10RL774_22a		3.2216	0.02	0.1085	0.01	107.40	1742.7	36.0	1774.1	15.0
10RL774_25a		3.5052	0.02	0.1038	0.01	104.40	1618.0	33.9	1693.2	14.1
10RL774_26a		4.1849	0.01	0.0906	0.01	102.40	1381.3	16.7	1438.3	16.2
10RL774_27a		3.1996	0.01	0.1082	0.01	101.40	1753.2	19.7	1769.5	14.4
10RL774_28a		2.9685	0.01	0.1173	0.01	100.40	1871.6	19.3	1916.1	13.4
10RL774_29a		3.9596	0.01	0.0906	0.01	99.40	1451.6	15.3	1438.5	15.1
10RL774_31a		4.0708	0.01	0.0924	0.01	97.40	1416.0	15.9	1476.6	16.0
10RL774_32a		3.3425	0.01	0.1053	0.01	96.40	1687.2	18.3	1719.0	14.5
10RL774_33a		3.5072	0.01	0.1038	0.01	95.40	1617.1	19.4	1692.3	15.9
10RL774_35a		3.3497	0.01	0.1048	0.01	93.40	1684.0	18.7	1711.5	14.6

10RL774_36a	2.0492	0.01	0.1668	0.01	92.40	2562.0	30.5	2526.0	13.8
10RL774_37a	3.4292	0.01	0.1037	0.01	91.40	1649.6	20.5	1692.3	14.4
10RL774_38a	3.2500	0.01	0.1034	0.01	90.40	1729.3	19.5	1686.1	14.1
10RL774_39a	1.4921	0.01	0.2624	0.01	89.40	3306.7	35.2	3261.3	12.2
10RL774_40a	3.2954	0.01	0.1094	0.01	88.40	1708.4	19.5	1790.1	13.7
10RL774_41a	3.0061	0.02	0.1094	0.01	86.40	1851.2	37.3	1790.1	14.9
10RL774_42a	2.9992	0.02	0.1147	0.01	85.40	1855.0	37.0	1874.9	14.3
10RL774_43a	3.3653	0.02	0.1045	0.01	84.40	1677.2	33.7	1705.0	16.2
10RL774_44a	3.4622	0.02	0.1039	0.01	83.40	1635.7	32.8	1694.4	14.8
10RL774_51a	3.2453	0.02	0.1094	0.01	76.40	1731.5	34.6	1790.1	14.0
10RL774_52a	3.3103	0.02	0.1044	0.01	75.40	1701.6	34.6	1703.4	16.9
10RL774_54a	3.3268	0.02	0.1070	0.01	73.40	1694.2	34.4	1748.8	16.2
10RL774_56a	3.5393	0.02	0.1006	0.01	70.40	1604.1	29.9	1635.7	22.9
10RL774_57a	3.9486	0.02	0.0924	0.01	69.40	1455.2	28.0	1475.0	24.0
10RL774_58a	3.1855	0.02	0.1083	0.01	68.40	1760.0	33.0	1770.5	20.8
10RL774_60a	3.4525	0.02	0.1048	0.01	66.40	1639.7	30.5	1710.4	20.5
10RL774_61a	3.3284	0.02	0.1077	0.01	65.40	1693.5	30.8	1761.1	20.9
10RL774_62a	3.3811	0.02	0.1017	0.01	64.40	1670.2	30.8	1654.7	20.9
10RL774_63a	2.0550	0.02	0.1777	0.01	63.40	2556.0	44.1	2631.2	18.6
10RL774_66a	3.3237	0.02	0.1057	0.01	60.40	1695.6	30.4	1727.1	20.5
10RL774_67a	2.9145	0.02	0.1193	0.01	59.40	1901.6	34.0	1946.4	20.0
10RL774_68a	3.3243	0.02	0.1059	0.01	58.40	1695.3	32.1	1729.4	20.9
10RL774_72a	3.3660	0.02	0.1050	0.01	53.40	1676.9	23.1	1713.9	12.0
10RL774_74a	3.5177	0.02	0.1035	0.01	51.40	1612.8	22.6	1687.0	13.3
10RL774_75a	3.3704	0.02	0.1050	0.01	50.40	1674.9	25.5	1714.6	16.6
10RL774_76a	3.2738	0.02	0.1054	0.01	49.40	1718.3	23.3	1721.6	11.9
10RL774_77a	3.3059	0.02	0.1070	0.01	48.40	1703.6	22.8	1748.7	11.9
10RL774_78a	3.5479	0.02	0.1030	0.01	47.40	1600.7	22.5	1678.7	12.9
10RL774_79a	3.6714	0.01	0.0975	0.01	46.40	1552.8	20.7	1577.2	12.4
10RL774_80a	3.5274	0.02	0.1005	0.01	45.40	1608.9	23.4	1634.1	15.0
10RL774_84a	3.4807	0.02	0.1020	0.01	41.40	1628.0	22.5	1660.4	12.9
10RL774_86a	3.4093	0.02	0.1042	0.01	38.40	1658.1	26.3	1700.1	16.3

10RL774_87a	3.4750	0.02	0.1010	0.01	37.40	1630.4	25.2	1643.0	16.9
10RL774_89a	3.3491	0.02	0.1053	0.01	35.40	1684.3	25.2	1719.5	15.4
10RL774_91a	3.4051	0.02	0.1116	0.01	33.40	1659.9	26.7	1825.0	15.2
10RL774_92a	3.1737	0.02	0.1044	0.01	32.40	1765.7	28.1	1703.4	17.0
10RL774_93a	3.1777	0.02	0.1063	0.01	31.40	1763.7	26.5	1736.2	16.2
10RL774_94a	2.9717	0.02	0.1141	0.01	30.40	1869.8	28.3	1866.3	15.2
10RL774_97a	3.3557	0.02	0.1061	0.01	27.40	1681.4	25.9	1733.8	15.6
10RL774_98a	3.6464	0.02	0.0994	0.01	26.40	1562.3	25.1	1612.7	18.0
10RL774_99a	3.3580	0.02	0.1053	0.01	25.40	1680.4	26.3	1719.1	17.3
10RL774_101a	3.4826	0.02	0.1055	0.01	22.40	1627.3	26.0	1723.8	19.4
10RL774_102a	3.9171	0.02	0.0922	0.01	21.40	1465.7	23.4	1471.4	17.9
10RL774_104a	3.1207	0.02	0.1052	0.01	19.40	1791.9	28.6	1717.9	16.2
10RL774_105a	3.5142	0.02	0.1052	0.01	17.40	1614.3	26.8	1717.6	15.6
10RL774_106a	3.3230	0.02	0.1086	0.01	16.40	1695.9	26.0	1775.9	15.7
10RL774_107a	3.3083	0.02	0.1062	0.01	15.40	1702.6	28.8	1735.5	18.5
10RL774_108a	3.4724	0.02	0.1016	0.01	14.40	1631.5	25.4	1653.3	16.4
10RL774_110a	3.3339	0.02	0.1094	0.01	12.40	1691.1	27.7	1789.7	17.0
10RL774_113a	3.2598	0.02	0.1071	0.01	9.40	1724.8	27.2	1750.3	16.5
10RL774_116a	3.1605	0.02	0.1091	0.01	4.40	1772.1	27.9	1784.0	19.5
10RL774_118a	3.3140	0.02	0.1045	0.01	2.40	1700.0	27.3	1705.3	21.1
10RL774_119a	3.5266	0.02	0.1031	0.01	1.40	1609.3	25.6	1681.0	20.6
10RL774_120a	3.5431	0.02	0.1021	0.01	0.40	1602.6	26.2	1663.3	21.9
> 10 % discordant									
10RL774_2a113.69710.03		0.0587	0.04	129.40	56.5	1.8	554.3	79.6	
10RL774_4a4.2051	0.03	0.1067	0.00	126.40	1375.3	31.5	1743.4	8.5	
10RL774_23a	3.8376	0.02	0.1034	0.01	106.40	1492.8	32.5	1685.8	15.6
10RL774_24a	2.5742	0.03	0.1530	0.01	105.40	2115.7	47.2	2380.0	15.4
10RL774_34a	5.0566	0.01	0.0896	0.01	94.40	1163.3	15.8	1416.2	15.4
10RL774_48a	4.0268	0.02	0.1005	0.01	79.40	1429.9	29.7	1633.4	14.3
10RL774_55a	4.2886	0.02	0.1023	0.01	72.40	1351.1	28.4	1666.8	15.3
10RL774_69a	3.9159	0.02	0.1034	0.01	57.40	1466.1	28.1	1686.7	21.0
10RL774_71a	4.6180	0.02	0.1006	0.01	54.40	1263.6	21.4	1634.5	17.1

10RL774_103a		-37.5253	0.24	0.0779	0.02	20.40	-174.1	-42.6	1143.1	41.5
10RL774_112a		129.9360	0.02	0.0472	0.03	10.40	49.4	1.2	59.6	59.8
10RL774_112b		131.7525	0.02	0.0476	0.02	8.40	48.7	1.0	78.6	42.1

sample name	**238U 206Pb**	**1 sigma % error**	**207Pb 206Pb**	**1 sigma % error**	**Th U**	**206/238 age**	**1 sigma abs err**	**207/206 age**	**1 sigma abs err**	
10RL775										
<10% discordant										
10RL775_1a3.3612		0.04	0.1050	0.02	53.29	1679.0	64.6	1714.5	27.7	
10RL775_3a3.2863		0.04	0.1041	0.02	51.29	1712.6	66.0	1698.3	29.3	
10RL775_7a3.7194		0.04	0.0999	0.02	47.29	1535.0	60.4	1622.1	29.9	
10RL775_9a4.2554		0.04	0.0911	0.02	45.29	1360.6	53.7	1448.2	29.2	
10RL775_11a		4.5586	0.02	0.0855	0.01	42.29	1278.5	17.8	1327.2	25.6
10RL775_12a		3.3855	0.02	0.1031	0.01	41.29	1668.3	22.3	1679.9	25.2
10RL775_14a		4.1334	0.02	0.0869	0.01	39.29	1396.7	19.0	1358.2	26.6
10RL775_15a		3.3296	0.02	0.1045	0.01	38.29	1693.0	25.0	1705.8	27.1
10RL775_16a		3.5634	0.02	0.0994	0.01	37.29	1594.6	21.4	1612.0	25.9
10RL775_17a		3.7572	0.02	0.0965	0.01	36.29	1521.3	21.4	1557.2	27.2
10RL775_18a		4.4930	0.02	0.0844	0.02	35.29	1295.4	20.1	1301.3	31.6
10RL775_20a		4.4696	0.02	0.0851	0.02	33.29	1301.6	19.8	1316.8	29.2
10RL775_21a		3.5337	0.02	0.0998	0.01	32.29	1606.4	23.0	1621.2	26.4
10RL775_22a		3.2155	0.02	0.1050	0.01	31.29	1745.6	25.2	1713.5	27.0
10RL775_23a		3.4689	0.02	0.1044	0.01	30.29	1632.9	23.1	1703.0	25.1
10RL775_25a		3.3802	0.02	0.1048	0.01	28.29	1670.6	22.0	1709.9	25.2
10RL775_26a		3.3578	0.01	0.1084	0.01	26.29	1680.5	14.4	1772.7	16.9
10RL775_27a		3.3816	0.01	0.1063	0.01	25.29	1670.1	14.4	1737.3	17.6
10RL775_28a		4.0949	0.01	0.0914	0.01	24.29	1408.5	12.7	1454.9	19.2
10RL775_29a		3.1975	0.01	0.1070	0.01	23.29	1754.2	15.2	1748.6	18.0
10RL775_30a		3.4942	0.01	0.1028	0.01	22.29	1622.5	15.8	1676.1	20.7
10RL775_31a		4.2437	0.01	0.0920	0.01	21.29	1364.0	14.1	1467.3	19.3
10RL775_32a		3.8889	0.01	0.0959	0.01	20.29	1475.2	13.1	1546.3	17.2

10RL775_33a	3.4987	0.01	0.1034	0.01	19.29	1620.6	13.0	1685.6	16.7
10RL775_39a	3.5957	0.01	0.0993	0.01	13.29	1581.9	16.7	1610.7	18.3
10RL775_40a	3.9872	0.01	0.0911	0.01	12.29	1442.6	13.1	1447.8	18.8
10RL775_41a	3.3371	0.01	0.1077	0.01	10.29	1689.6	22.2	1760.8	15.1
10RL775_42a	3.2370	0.01	0.1087	0.01	9.29	1735.4	22.5	1777.5	13.6
10RL775_44a	3.3355	0.02	0.1048	0.01	7.29	1690.3	22.4	1711.5	14.5
10RL775_45a	3.2782	0.02	0.1053	0.01	6.29	1716.3	22.7	1720.3	14.6
10RL775_46a	3.3115	0.01	0.1062	0.01	5.29	1701.1	22.3	1734.4	14.3
10RL775_47a	3.4251	0.01	0.1048	0.01	4.29	1651.3	21.8	1710.9	14.2
10RL775_48a	3.6030	0.02	0.1049	0.01	3.29	1579.0	22.6	1712.5	15.6
10RL775_51a	3.3839	0.02	0.1054	0.01	0.29	1669.0	22.7	1721.2	15.3
10RL775_53a	3.9786	0.02	0.0910	0.01	0.34	1445.4	19.5	1445.9	15.5
10RL775_55a	3.5109	0.01	0.1095	0.01	0.39	1615.6	20.9	1791.9	13.5
10RL775_57a	3.3283	0.01	0.1028	0.01	0.33	1693.6	15.6	1675.5	16.9
10RL775_59a	3.4500	0.01	0.1056	0.01	0.27	1640.8	16.1	1724.8	13.3
10RL775_60a	2.3248	0.01	0.1560	0.01	0.23	2306.4	16.0	2412.3	11.3
10RL775_61a	3.5709	0.01	0.1031	0.01	0.21	1591.6	13.6	1679.9	15.1
10RL775_62a	3.4044	0.01	0.1053	0.01	0.20	1660.2	14.4	1720.1	14.8
10RL775_64a	3.5190	0.01	0.0999	0.01	0.36	1612.4	14.8	1622.2	16.8
10RL775_66a	4.6556	0.01	0.0857	0.01	0.39	1254.3	10.6	1331.2	15.7
10RL775_67a	3.6165	0.01	0.1006	0.01	0.37	1573.8	13.1	1635.3	14.2
10RL775_69a	4.2213	0.01	0.0905	0.01		1370.5	13.2	1437.0	15.8
10RL775_70a	3.2783	0.01	0.1053	0.01		1716.2	16.0	1719.0	14.8
10RL775_71a	4.1283	0.01	0.0892	0.01		1398.3	15.2	1409.2	13.7
10RL775_72a	3.3683	0.01	0.1069	0.01		1675.9	17.3	1747.6	9.6
10RL775_73a	4.4337	0.01	0.0902	0.01		1311.1	14.2	1430.1	12.6
10RL775_77a	2.0933	0.01	0.1832	0.00		2517.3	24.6	2682.5	8.1
10RL775_80a	4.0508	0.01	0.0921	0.01		1422.3	16.9	1469.8	13.4
10RL775_81a	3.3163	0.01	0.1082	0.01		1698.9	20.2	1769.5	11.2
10RL775_82a	3.4634	0.01	0.1039	0.01		1635.2	20.0	1695.3	12.6
10RL775_83a	4.0000	0.01	0.0913	0.01		1438.5	17.4	1452.2	13.4
10RL775_85a	2.2012	0.01	0.1605	0.01		2414.3	27.3	2461.3	11.8

10RL775_88a	4.0447	0.01	0.0890	0.01		1424.2	17.6	1404.8	13.6
10RL775_89a	3.1929	0.01	0.1103	0.01		1756.4	20.5	1804.0	11.2
10RL775_90a	4.5531	0.01	0.0855	0.01		1279.9	15.4	1326.6	14.8
10RL775_91a	4.2216	0.02	0.0910	0.01		1370.4	22.1	1446.6	10.4
10RL775_92a	3.8070	0.02	0.0975	0.01		1503.5	26.0	1577.1	19.6
10RL775_93a	4.5138	0.02	0.0863	0.01		1290.0	21.2	1344.8	12.1
10RL775_94a	3.1078	0.02	0.1133	0.01		1798.4	29.0	1852.6	13.4
10RL775_95a	3.1536	0.02	0.1079	0.01		1775.5	28.0	1763.9	9.9
10RL775_96a	3.1660	0.02	0.1072	0.01		1769.5	28.1	1751.8	12.5
10RL775_98a	3.3575	0.02	0.1051	0.01		1680.6	26.5	1715.6	11.0
10RL775_99a	3.3248	0.02	0.1039	0.01		1695.1	28.7	1694.8	12.2
10RL775_100a	4.8276	0.02	0.0870	0.01		1213.6	22.1	1361.3	23.8
10RL775_102a	3.2632	0.02	0.1052	0.00		1723.2	29.0	1717.8	7.3
10RL775_104a	4.0361	0.02	0.0903	0.01		1426.9	23.2	1432.9	13.8
10RL775_105a	2.2224	0.02	0.1602	0.01		2395.1	37.5	2457.9	10.5
10RL775_106a	3.6507	0.02	0.1064	0.01		1560.7	24.5	1739.3	12.4
10RL775_107a	4.7342	0.02	0.0866	0.01		1235.4	21.3	1351.4	22.7
10RL775_109a	3.5182	0.02	0.1059	0.01		1612.7	25.7	1729.4	16.9
10RL775_110a	3.8036	0.02	0.0971	0.01		1504.7	23.6	1569.7	16.0
10RL775_111a	4.0919	0.02	0.0919	0.01		1409.4	22.8	1464.5	17.0
10RL775_112a	3.3383	0.02	0.1033	0.01		1689.1	28.4	1684.8	21.3
10RL775_113a	3.4464	0.02	0.1043	0.01		1642.3	25.2	1702.0	12.1
10RL775_114a	3.4152	0.02	0.1058	0.01		1655.6	25.4	1728.9	12.8
10RL775_116a	3.4632	0.02	0.1064	0.01		1635.3	25.5	1739.3	12.3
10RL775_117a	4.1717	0.02	0.0925	0.01		1385.2	21.8	1477.1	13.4
> 10 % discordant									
10RL775_6a3.8451	0.04	0.1035	0.02	48.29	1490.2	59.3	1688.0	29.7	
10RL775_43a	3.5446	0.02	0.1122	0.01	8.29	1602.0	22.1	1835.4	17.3
10RL775_68a	3.9782	0.01	0.1051	0.01		1445.5	12.0	1716.4	12.6
10RL775_115a	3.6542	0.02	0.1076	0.01		1559.3	25.0	1758.8	11.0
sample	**238U**	**1 sigma**	**207Pb**	**1 sigma**	**Th**	**206/238**	**1 sigma**	**207/206**	**1 sigma**

name	206Pb	% error	206Pb	% error	U	age	abs err	age	abs err
10RL878									
< 10 % discordant									
10RL878_1c	4.6491	0.01	0.0886	0.01	45.29	1255.9	14.1	1394.6	16.6
10RL878_4a	3.4908	0.01	0.1056	0.01	44.29	1623.8	17.8	1725.3	16.0
10RL878_5a	3.1405	0.02	0.1121	0.01	43.29	1782.0	25.0	1833.2	17.8
10RL878_7a	4.5996	0.01	0.0847	0.01	41.29	1268.2	15.5	1308.7	17.7
10RL878_8a	3.5349	0.01	0.1062	0.01	40.29	1605.9	16.6	1735.3	15.1
10RL878_9a	3.4207	0.01	0.1073	0.01	39.29	1653.2	17.1	1754.7	14.6
10RL878_10a	3.5156	0.01	0.1043	0.01	38.29	1613.7	16.9	1701.6	14.7
10RL878_11a	4.4078	0.02	0.0901	0.01	36.29	1318.1	22.1	1427.5	18.7
10RL878_12a	3.4205	0.02	0.1053	0.01	35.29	1653.3	26.8	1718.8	17.5
10RL878_14a	3.4733	0.02	0.1043	0.01	33.29	1631.1	28.4	1702.6	19.0
10RL878_16a	3.4641	0.02	0.1046	0.01	31.29	1634.9	27.3	1707.2	18.5
10RL878_17a	3.6837	0.02	0.1013	0.01	30.29	1548.2	28.0	1647.3	18.8
10RL878_18a	4.2867	0.02	0.0902	0.01	29.29	1351.7	24.1	1429.2	19.7
10RL878_20a	3.2879	0.02	0.1068	0.01	27.29	1711.8	28.1	1746.2	17.5
10RL878_21a	3.3185	0.02	0.1058	0.01	26.29	1698.0	27.8	1727.6	17.3
10RL878_22a	3.3671	0.02	0.1059	0.01	25.29	1676.4	27.2	1730.2	17.5
10RL878_23a	4.0684	0.02	0.0911	0.01	24.29	1416.8	23.9	1448.6	18.8
10RL878_24b	3.5332	0.02	0.1048	0.01	21.29	1606.6	26.4	1710.4	17.1
10RL878_26a	3.2033	0.01	0.1140	0.01	19.29	1751.4	22.4	1863.5	13.1
10RL878_28a	3.3850	0.01	0.1045	0.01	17.29	1668.6	20.6	1706.2	9.9
10RL878_30a	3.5455	0.01	0.1046	0.01	15.29	1601.7	21.0	1708.1	10.0
10RL878_32a	4.4960	0.01	0.0851	0.01	13.29	1294.6	17.1	1318.8	11.5
10RL878_35a	3.5624	0.01	0.1050	0.01	10.29	1594.9	19.7	1713.6	10.6
10RL878_36a	3.5439	0.01	0.1038	0.01	9.29	1602.3	19.6	1692.8	10.0
10RL878_37a	3.3421	0.01	0.1088	0.01	8.29	1687.4	20.5	1779.0	10.6
10RL878_38a	3.5683	0.02	0.1015	0.01	7.29	1592.6	22.1	1652.3	14.5
10RL878_39a	3.3983	0.01	0.1062	0.01	6.29	1662.8	20.9	1735.8	11.0
10RL878_42a	3.8462	0.01	0.0987	0.01	2.29	1489.8	19.1	1600.2	10.2

10RL878_47a	4.0863	0.01	0.0903	0.01	0.34	1411.2	17.4	1431.4	11.8
10RL878_50a	9.3954	0.02	0.0601	0.02	0.37	652.0	9.8	607.7	32.6
10RL878_51a	3.3341	0.01	0.1070	0.01	0.33	1691.0	21.8	1749.7	10.3
10RL878_53a	3.4509	0.01	0.1042	0.01	0.27	1640.4	20.2	1699.5	10.7
10RL878_55a	3.3611	0.02	0.1073	0.00	0.21	1679.0	26.1	1753.6	8.7
10RL878_56a	3.3288	0.02	0.1052	0.01	0.29	1693.3	26.2	1717.2	13.4
10RL878_57a	4.1810	0.02	0.0919	0.01	0.36	1382.4	22.4	1464.9	16.3
10RL878_59a	4.1993	0.02	0.0897	0.01	0.39	1377.0	23.7	1419.3	17.2
10RL878_61a	3.3064	0.02	0.1065	0.01		1703.4	26.4	1740.8	13.9
10RL878_63a	2.1796	0.02	0.1655	0.01		2434.2	35.8	2512.2	12.5
10RL878_64a	3.4287	0.02	0.1055	0.01		1649.8	26.3	1723.4	14.8
10RL878_66a	3.3015	0.02	0.1070	0.01		1705.7	25.8	1749.7	13.4
10RL878_67a	4.6207	0.02	0.0868	0.01		1262.9	21.4	1356.0	21.2
10RL878_69a	4.0874	0.02	0.0902	0.01		1410.8	21.8	1429.7	15.1
10RL878_72a	4.5742	0.01	0.0855	0.01		1274.6	16.9	1327.6	16.4
10RL878_75a	3.8293	0.01	0.0968	0.01		1495.7	19.4	1564.0	13.7
10RL878_76a	3.3743	0.01	0.1075	0.01		1673.2	21.0	1757.9	11.9
10RL878_77a	3.4063	0.02	0.1059	0.01		1659.4	22.3	1730.8	14.4
10RL878_78a	4.1436	0.01	0.0914	0.01		1393.6	18.1	1454.7	12.1
10RL878_79a	3.2597	0.02	0.1103	0.01		1724.8	23.3	1805.1	12.0
10RL878_83a	3.4256	0.02	0.1062	0.01		1651.1	25.0	1735.4	12.2
10RL878_85a	3.4337	0.01	0.1094	0.01		1647.7	20.9	1789.3	11.8
10RL878_89a	3.5881	0.01	0.1066	0.01		1584.8	15.9	1742.0	15.3
10RL878_90a	3.3187	0.01	0.1058	0.01		1697.8	14.3	1728.2	14.7
10RL878_92a	4.0763	0.01	0.0907	0.01		1414.3	12.3	1441.4	14.9
10RL878_93a	3.4236	0.01	0.1067	0.01		1652.0	15.6	1744.1	14.4
10RL878_94a	3.3833	0.01	0.1043	0.01		1669.3	13.3	1702.0	14.2
10RL878_96a	3.2188	0.01	0.1056	0.01		1744.0	14.3	1724.2	14.3
10RL878_98a	3.3095	0.01	0.1060	0.01		1702.0	14.0	1731.1	14.1
10RL878_99a	4.0959	0.01	0.0900	0.01		1408.2	12.0	1426.1	15.9
10RL878_100a	3.1747	0.01	0.1065	0.01		1765.2	14.3	1739.6	13.8
10RL878_101a	4.3013	0.01	0.0911	0.01		1347.5	18.0	1449.2	13.0

sample name	238U 206Pb	1 sigma % error	207Pb 206Pb	1 sigma % error	Th U	206/238 age	1 sigma abs err	207/206 age	1 sigma abs err
10RL878_102a	3.9425	0.01	0.0900	0.01		1457.3	17.1	1424.5	11.0
10RL878_103a	3.6209	0.01	0.1014	0.00		1572.1	17.6	1650.2	9.0
10RL878_104a	4.2478	0.01	0.0867	0.01		1362.8	15.9	1353.5	10.4
10RL878_105a	3.9742	0.01	0.0929	0.01		1446.8	16.1	1486.8	10.6
10RL878_107a	10.0866	0.01	0.0619	0.00		609.4	7.3	669.3	10.5
> 10 % discordant									
10RL878_1b	4.4821	0.01	0.0917	0.01	46.29	1298.3	14.0	1461.1	15.4
10RL878_6a	3.9174	0.02	0.1047	0.01	42.29	1465.6	20.5	1709.5	15.3
10RL878_15a	4.8739	0.02	0.0915	0.01	32.29	1203.1	20.4	1457.2	17.7
10RL878_19a	4.0160	0.02	0.1064	0.01	28.29	1433.3	25.2	1739.1	17.6
10RL878_29a	4.2946	0.01	0.0989	0.01	16.29	1349.4	18.1	1602.6	12.3
10RL878_34a	4.0404	0.01	0.1049	0.01	11.29	1425.6	18.3	1713.1	11.6
10RL878_41a	4.6589	0.01	0.1041	0.01	3.29	1253.5	16.4	1697.8	11.9
10RL878_44a	4.0240	0.01	0.0999	0.01	0.29	1430.8	17.2	1622.1	12.2
10RL878_45a	4.0610	0.01	0.1023	0.01	0.36	1419.1	17.3	1665.9	10.3
10RL878_54a	4.2610	0.01	0.1041	0.01	0.23	1359.0	17.6	1698.4	10.3
10RL878_60a	4.6923	0.02	0.0886	0.01	0.37	1245.4	19.4	1395.4	15.8
10RL878_71a	4.6246	0.02	0.1054	0.01		1261.9	18.3	1721.9	12.2
10RL878_73a	4.0056	0.02	0.1050	0.01		1436.7	20.4	1713.6	14.8
10RL878_80a	3.5864	0.02	0.1088	0.01		1585.5	23.6	1778.6	12.9
10RL878_81a	4.8792	0.02	0.0921	0.01		1201.9	17.4	1468.6	12.4
10RL878_82a	3.7829	0.01	0.1085	0.01		1512.0	19.4	1775.2	11.2
10RL878_84a	3.7039	0.02	0.1063	0.01		1540.7	20.7	1736.7	13.4
10RL878_86a	3.7811	0.01	0.1067	0.01		1512.7	12.2	1744.6	14.1
10RL878_88a	4.9917	0.01	0.1016	0.01		1177.1	12.9	1653.5	14.3
10RL878_91a	4.7536	0.01	0.0881	0.01		1230.8	10.5	1384.9	14.4
10RL878_95a	3.9299	0.01	0.1031	0.01		1461.4	12.5	1679.9	14.6
10RL878_97a	4.7033	0.01	0.0884	0.01		1242.7	10.8	1390.4	15.3
10RL878_108a	4.7160	0.02	0.0988	0.01		1239.7	18.9	1602.3	11.9

10RL888

< 10 % discordant									
10RL888_3a	3.5443	0.02	0.1094	0.01	34.29	1602.1	27.4	1788.7	15.8
10RL888_14a	1.7820	0.01	0.2282	0.01	19.29	2871.5	31.4	3039.2	10.9
10RL888_15a	2.1681	0.01	0.1880	0.01	17.29	2445.0	25.7	2724.8	9.0
10RL888_16a	3.4992	0.01	0.1073	0.01	16.29	1620.4	17.4	1753.5	9.5
10RL888_26a	3.5900	0.01	0.1081	0.01	2.29	1584.1	20.7	1766.8	9.5
10RL888_32a	3.1803	0.02	0.1139	0.01	0.39	1762.5	23.2	1862.8	10.1
10RL888_44a	3.3393	0.02	0.1093	0.01	0.37	1688.7	22.9	1787.4	14.7
10RL888_45a	3.3123	0.01	0.1091	0.01		1700.8	22.2	1783.9	13.0
10RL888_52a	3.7545	0.02	0.1006	0.01		1522.2	21.9	1634.3	9.9
10RL888_54a	3.3593	0.02	0.1095	0.00		1679.8	23.3	1790.7	7.5
10RL888_56a	3.4229	0.02	0.1094	0.00		1652.3	24.3	1789.0	8.8
10RL888_67a	3.1645	0.01	0.1084	0.01		1770.2	17.9	1772.7	9.3
10RL888_78a	3.2606	0.01	0.1099	0.01		1724.4	16.9	1797.2	10.2
10RL888_84a	1.9120	0.01	0.1997	0.01		2712.0	28.7	2823.5	12.4
10RL888_89a	2.1522	0.01	0.1716	0.01		2460.0	26.5	2573.7	12.4
10RL888_90a	3.3002	0.01	0.1112	0.01		1706.2	19.5	1818.7	15.1
10RL888_94a	3.2428	0.01	0.1073	0.01		1732.7	19.9	1753.3	16.1
10RL888_95a	3.2778	0.01	0.1074	0.01		1716.5	19.2	1755.7	13.9
10RL888_107a	3.4544	0.02	0.1096	0.01		1639.0	25.9	1792.7	24.4
10RL888_108a	1.9034	0.02	0.2173	0.01		2721.9	39.1	2960.8	18.7
10RL888_112a	3.4766	0.02	0.1073	0.01		1629.7	29.0	1754.6	26.8
10RL888_115a	3.3111	0.02	0.1126	0.01		1701.3	28.3	1841.5	25.9
10RL888_116a	3.4628	0.02	0.1083	0.01		1635.4	25.5	1770.7	23.3
10RL888_117a	3.4702	0.02	0.1079	0.01		1632.4	27.5	1764.3	22.0
> 10 % discordant									
10RL888_2a	4.1954	0.02	0.1062	0.01	35.29	1378.1	23.2	1735.7	13.8
10RL888_6b	2.7709	0.02	0.1564	0.01	29.29	1986.4	32.8	2417.4	13.1
10RL888_10b	2.4352	0.02	0.1992	0.01	24.29	2217.8	35.1	2819.3	12.3
10RL888_20b	2.4833	0.01	0.1676	0.01	9.29	2181.4	22.2	2533.9	9.2

10RL888_30a	3.7505	0.02	0.1076	0.01	0.35	1523.7	20.5	1759.0	9.7
10RL888_36a	3.5093	0.01	0.1130	0.01	0.27	1616.3	21.0	1847.8	10.4
10RL888_38a	4.6444	0.02	0.1089	0.01	0.21	1257.1	18.5	1780.4	10.6
10RL888_39a	3.7906	0.02	0.1125	0.01	0.20	1509.3	20.5	1840.8	9.9
10RL888_40a	4.1591	0.01	0.1084	0.01	0.29	1389.0	18.1	1771.9	9.9
10RL888_57a	3.6472	0.02	0.1099	0.01		1562.0	22.5	1798.0	10.0
10RL888_61a	2.4067	0.02	0.1684	0.00		2240.0	30.3	2541.5	7.0
10RL888_65a	3.7749	0.02	0.1088	0.00		1514.9	21.7	1780.2	9.0
10RL888_66a	4.1293	0.01	0.1081	0.01		1398.0	15.4	1767.0	10.3
10RL888_92a	3.3310	0.01	0.1139	0.01		1692.3	19.0	1861.8	12.9
10RL888_93a	3.2838	0.01	0.1139	0.01		1713.7	19.6	1863.1	13.0
10RL888_96a	3.8148	0.02	0.1084	0.00		1500.8	26.7	1772.9	8.7
10RL888_101a	2.6368	0.02	0.2031	0.01		2072.8	32.6	2851.0	10.1
10RL888_106a	4.7201	0.02	0.1053	0.01		1238.7	20.6	1720.4	22.7
10RL888_114a	3.6293	0.02	0.1090	0.01		1568.9	23.0	1783.2	21.7
10RL888_123a	3.7035	0.01	0.1093	0.01		1540.9	19.7	1787.7	25.6
10RL888_127a	3.2342	0.02	0.1630	0.01		1736.7	24.3	2486.5	23.3

sample name	**238U 206Pb**	**1 sigma % error**	**207Pb 206Pb**	**1 sigma % error**	**Th U**	**206/238 age**	**1 sigma abs err**	**207/206 age**	**1 sigma abs err**
10RL893									
< 10 % discordant									
10RL893_1a	4.3000	0.02	0.0897	0.01	0.29	1347.9	21.5	1419.0	18.3
10RL893_2a	5.1043	0.02	0.0773	0.01	0.36	1153.3	17.4	1129.3	22.0
10RL893_4a	9.8399	0.02	0.0613	0.01	0.35	623.9	13.1	650.5	25.8
10RL893_5a	5.3170	0.02	0.0799	0.01	0.34	1110.9	16.3	1195.6	19.9
10RL893_8a	4.1468	0.02	0.0898	0.01	0.39	1392.7	19.5	1420.9	16.6
10RL893_9a	4.3712	0.02	0.0898	0.01	0.40	1328.1	18.5	1422.3	17.2
10RL893_10a	4.6626	0.02	0.0864	0.01	0.37	1252.6	18.5	1347.9	19.4
10RL893_11a	1.8505	0.02	0.2031	0.01	0.33	2785.1	37.4	2851.2	14.1
10RL893_12a	5.5591	0.02	0.0753	0.01	0.30	1066.4	17.7	1077.4	22.9

10RL893_16a	5.4642	0.02	0.0785	0.01	0.27	1083.4	18.0	1159.3	19.0
10RL893_17a	5.8102	0.02	0.0768	0.01	0.23	1023.7	18.6	1116.2	22.2
10RL893_18a	1.6998	0.02	0.2194	0.01	0.21	2982.5	40.5	2976.3	13.2
10RL893_19a	4.4994	0.02	0.0868	0.01	0.20	1293.8	20.0	1355.3	16.9
10RL893_20a	4.0042	0.02	0.0907	0.01	0.29	1437.1	22.0	1440.5	16.0
10RL893_21a	3.9965	0.02	0.0915	0.01	0.36	1439.6	22.7	1456.7	16.9
10RL893_22a	3.6807	0.02	0.0978	0.01	0.36	1549.4	23.1	1582.3	15.9
10RL893_27a	6.0078	0.02	0.0738	0.01	0.39	992.5	15.5	1036.4	17.7
10RL893_29a	4.2254	0.02	0.0907	0.01	0.37	1369.3	20.4	1441.0	15.4
10RL893_30a	3.7893	0.02	0.0979	0.01		1509.8	23.3	1583.8	17.5
10RL893_31a	5.4420	0.01	0.0763	0.00		1087.5	10.2	1102.3	9.8
10RL893_32a	5.7600	0.01	0.0759	0.00		1032.0	10.0	1092.6	7.6
10RL893_34a	4.0324	0.01	0.0905	0.01		1428.1	14.3	1435.3	11.5
10RL893_35a	5.5159	0.01	0.0763	0.00		1074.0	10.6	1103.5	8.1
10RL893_36a	4.4165	0.01	0.0854	0.00		1315.7	11.6	1325.7	9.3
10RL893_37a	3.4618	0.01	0.1011	0.01		1635.9	15.2	1644.5	10.6
10RL893_38a	5.2776	0.01	0.0754	0.00		1118.6	9.8	1077.9	8.4
10RL893_39a	3.3981	0.01	0.1005	0.00		1662.9	14.4	1632.6	7.5
10RL893_40a	5.9592	0.01	0.0707	0.01		1000.0	10.4	948.0	15.5
10RL893_41a	3.9427	0.01	0.0911	0.01		1457.2	14.6	1448.2	12.7
10RL893_42a	5.4231	0.01	0.0742	0.00		1090.9	10.0	1046.6	9.0
10RL893_43a	7.8890	0.01	0.0650	0.01		769.3	7.9	775.8	11.5
10RL893_44a	5.2875	0.01	0.0754	0.00		1116.6	10.5	1079.9	7.8
10RL893_45a	5.3369	0.01	0.0760	0.00		1107.1	11.9	1094.9	9.2
10RL893_50a	5.4559	0.01	0.0753	0.01		1084.9	12.6	1077.2	18.8
10RL893_51a	5.6990	0.01	0.0749	0.01		1042.2	11.3	1065.6	14.1
10RL893_53a	5.1870	0.01	0.0753	0.01		1136.5	12.3	1077.6	12.2
10RL893_54a	4.1337	0.01	0.0903	0.01		1396.6	15.6	1431.1	12.5
10RL893_55a	3.7498	0.01	0.0945	0.01		1523.9	15.8	1517.3	11.9
10RL893_57a	3.0096	0.01	0.1128	0.01		1849.4	18.4	1845.8	11.2
10RL893_58a	5.1194	0.01	0.0789	0.01		1150.2	12.5	1168.5	13.2
10RL893_59a	5.4792	0.01	0.0778	0.01		1080.7	11.9	1142.0	13.5

10RL893_60a	5.5420	0.01	0.0755	0.01	1069.4	11.4	1080.8	13.9
10RL893_62a	5.3662	0.01	0.0762	0.01	1101.6	12.5	1099.6	19.0
10RL893_63a	3.0040	0.01	0.1198	0.01	1852.4	19.2	1952.6	11.7
10RL893_64a	5.9231	0.01	0.0762	0.01	1005.7	10.4	1100.5	11.6
10RL893_65a	5.2335	0.01	0.0783	0.01	1127.2	12.3	1154.4	11.8
10RL893_66a	5.3264	0.01	0.0808	0.01	1109.1	12.1	1215.6	14.1
10RL893_67a	4.8074	0.01	0.0832	0.01	1218.2	15.5	1274.7	23.1
10RL893_69a	3.3880	0.01	0.1017	0.01	1667.3	17.8	1654.5	14.8
10RL893_70a	3.3558	0.01	0.1010	0.01	1681.3	17.0	1643.4	11.4
10RL893_71a	5.0761	0.01	0.0785	0.01	1159.2	14.5	1158.8	14.4
10RL893_72a	4.3074	0.01	0.0899	0.01	1345.8	15.8	1422.6	13.1
10RL893_77a	5.1351	0.01	0.0781	0.01	1147.0	13.6	1150.6	12.9
10RL893_78a	4.7386	0.01	0.0818	0.01	1234.3	15.7	1241.2	21.3
10RL893_79a	3.9574	0.01	0.0943	0.01	1452.3	18.1	1515.0	15.0
10RL893_80a	5.5458	0.01	0.0743	0.01	1068.7	13.1	1049.5	15.2
10RL893_81a	5.4290	0.01	0.0752	0.01	1089.9	13.2	1073.9	14.1
10RL893_82a	4.0948	0.01	0.0913	0.01	1408.6	16.6	1452.8	12.2
10RL893_84a	5.4734	0.01	0.0766	0.01	1081.7	13.0	1110.5	13.3
10RL893_85a	4.7022	0.01	0.0818	0.01	1243.0	15.3	1241.4	14.3
10RL893_87a	5.7473	0.01	0.0759	0.01	1034.1	14.2	1091.8	22.2
10RL893_88a	4.3217	0.01	0.0900	0.01	1341.8	18.1	1425.7	21.2
10RL893_89a	4.2927	0.01	0.0884	0.01	1350.0	14.7	1392.1	16.0
10RL893_90a	4.5015	0.01	0.0863	0.01	1293.2	13.9	1344.1	16.9
10RL893_91a	3.3197	0.01	0.1080	0.01	1697.4	18.0	1766.8	14.7
10RL893_93a	5.8900	0.01	0.0763	0.01	1010.9	12.1	1103.0	17.4
10RL893_94a	5.5093	0.01	0.0767	0.01	1075.2	12.0	1113.2	16.4
10RL893_97a	5.8525	0.01	0.0743	0.01	1016.9	11.6	1050.1	17.9
10RL893_98a	4.2109	0.01	0.0901	0.01	1373.6	16.8	1427.0	16.5
10RL893_99a	5.5745	0.01	0.0764	0.01	1063.6	11.7	1104.3	18.7
10RL893_100a	5.8367	0.01	0.0749	0.01	1019.4	12.3	1066.8	17.6
10RL893_105a	4.9856	0.01	0.0796	0.01	1178.4	13.2	1188.1	17.4

> 10 % discordant

10RL893_3a6.3089	0.02	0.0766	0.01	0.36	948.5	14.7	1111.9	20.2	
10RL893_13a	5.1035	0.02	0.0899	0.01	0.27	1153.5	18.4	1423.3	17.7
10RL893_15a	4.2934	0.02	0.0940	0.01	0.23	1349.8	19.0	1508.3	17.5
10RL893_23a	2.2387	0.02	0.1825	0.01	0.35	2380.6	33.0	2675.3	13.3
10RL893_48a	3.6816	0.01	0.1075	0.00		1549.0	15.4	1757.4	7.9
10RL893_52a	6.1492	0.01	0.0766	0.01		971.3	11.5	1109.8	11.8
10RL893_56a	3.9155	0.01	0.1023	0.01		1466.2	15.5	1667.1	13.3
10RL893_68a	3.6824	0.01	0.1088	0.01		1548.7	16.4	1779.7	12.3
10RL893_73a	6.1503	0.01	0.0780	0.01		971.2	12.1	1147.8	13.2
10RL893_76a	4.9068	0.02	0.0861	0.01		1195.7	17.2	1341.3	18.9
10RL893_83a	4.5516	0.01	0.0922	0.01		1280.3	14.9	1471.1	11.6
10RL893_86a	6.3262	0.01	0.0753	0.01		946.1	10.9	1075.6	17.3
10RL893_92a	5.4097	0.02	0.0814	0.01		1093.4	15.7	1231.1	27.6
10RL893_95a	4.9575	0.01	0.0911	0.01		1184.5	15.9	1448.2	20.0
10RL893_96a	4.8395	0.01	0.0866	0.01		1210.9	14.9	1351.5	17.3
10RL893_101a	3.9957	0.01	0.0994	0.01		1439.9	15.5	1612.4	14.7

sample name	**238U 206Pb**	**1 sigma % error**	**207Pb 206Pb**	**1 sigma % error**	**Th U**	**206/238 age**	**1 sigma abs err**	**207/206 age**	**1 sigma abs err**
12DS14									
< 10 % discordant									
12DS14_1a2.7371	0.01	0.1180	0.00	118.27	2007.5	12.2	1926.3	8.6	
12DS14_2a2.8596	0.01	0.1126	0.01	117.27	1933.2	12.6	1842.2	9.8	
12DS14_3a2.7203	0.01	0.1164	0.00	116.27	2018.1	12.4	1902.2	8.6	
12DS14_4a2.8539	0.01	0.1117	0.00	115.27	1936.5	11.8	1828.0	8.8	
12DS14_5a2.8937	0.01	0.1124	0.00	114.27	1913.5	11.3	1838.0	8.9	
12DS14_9a2.9186	0.01	0.1115	0.00	110.27	1899.3	10.7	1824.6	8.6	
12DS14_10a2.9700	0.01	0.1130	0.01	109.27	1870.8	14.0	1847.6	10.3	
12DS14_11a2.8916	0.01	0.1118	0.01	107.27	1914.7	14.7	1829.4	9.8	
12DS14_12a2.9335	0.01	0.1121	0.01	106.27	1890.9	14.4	1833.8	9.6	
12DS14_13a2.7615	0.01	0.1164	0.01	105.27	1992.2	16.1	1901.5	10.5	

12DS14_14a2.4367	0.01	0.1281	0.00	104.27	2216.7	16.7	2071.7	7.5
12DS14_15a2.7290	0.01	0.1163	0.00	103.27	2012.6	16.0	1899.9	8.5
12DS14_17a2.6921	0.01	0.1190	0.00	101.27	2036.3	14.7	1941.5	7.6
12DS14_18a2.8539	0.01	0.1128	0.00	100.27	1936.5	14.7	1845.0	9.0
12DS14_19a2.6583	0.01	0.1179	0.00	99.27	2058.4	13.8	1925.1	7.7
12DS14_20a2.7748	0.01	0.1139	0.00	98.27	1984.0	13.6	1862.3	7.9
12DS14_21a2.9191	0.01	0.1113	0.00	96.27	1899.1	18.4	1821.3	6.1
12DS14_22a1.8247	0.01	0.1844	0.00	95.27	2816.9	25.5	2692.6	4.9
12DS14_24a2.7490	0.01	0.1184	0.00	93.27	2000.0	19.7	1931.8	7.1
12DS14_25a2.7537	0.01	0.1181	0.00	92.27	1997.1	19.2	1927.6	6.3
12DS14_26a2.6755	0.01	0.1227	0.01	91.27	2047.1	20.1	1996.2	9.2
12DS14_27a2.8038	0.01	0.1169	0.00	90.27	1966.3	19.9	1909.2	7.0
12DS14_28a5.6544	0.01	0.0753	0.01	89.27	1049.8	13.1	1077.8	18.8
12DS14_29a2.9385	0.01	0.1109	0.00	88.27	1888.2	19.2	1813.8	8.0
12DS14_30a2.8872	0.01	0.1121	0.00	81.27	1917.2	19.5	1834.0	8.4
12DS14_31a5.6506	0.02	0.0729	0.01	3.27	1050.4	15.2	1011.7	15.3
12DS14_32a1.8802	0.02	0.1857	0.00	36.27	2749.3	33.9	2704.0	6.8
12DS14_33a2.5632	0.01	0.1282	0.00	66.27	2123.5	27.0	2073.9	8.4
12DS14_34a2.9251	0.02	0.1125	0.01	43.27	1895.7	24.9	1839.8	11.4
12DS14_35a3.0487	0.01	0.1123	0.00	45.27	1828.7	23.5	1837.5	7.8
12DS14_36a2.5179	0.02	0.1285	0.00	47.27	2155.9	27.5	2078.0	7.9
12DS14_37a1.9509	0.01	0.1746	0.00	5.27	2667.6	32.2	2602.2	6.6
12DS14_38a2.9330	0.01	0.1122	0.00	41.27	1891.2	24.3	1834.8	8.1
12DS14_39a2.9659	0.02	0.1129	0.01	48.27	1873.0	24.8	1847.3	9.4
12DS14_40a2.2089	0.02	0.1476	0.01	1.27	2407.3	30.8	2318.9	8.9
12DS14_41a3.0320	0.01	0.1129	0.00	71.27	1837.5	20.4	1846.0	8.3
12DS14_42a3.0158	0.01	0.1138	0.01	75.27	1846.0	20.3	1860.3	9.6
12DS14_43a2.7942	0.01	0.1174	0.01	73.27	1972.2	22.4	1916.9	9.5
12DS14_44a2.9951	0.01	0.1128	0.00	68.27	1857.2	20.4	1844.7	8.5
12DS14_45a2.9598	0.01	0.1124	0.00	6.27	1876.4	20.7	1839.3	7.7
12DS14_46a2.9460	0.01	0.1118	0.00	26.27	1884.0	19.9	1829.5	7.6
12DS14_47a1.9260	0.01	0.1878	0.00	49.27	2695.9	27.8	2723.3	7.3

12DS14_48a2.6255	0.01	0.1303	0.01	53.27	2080.4	22.7	2102.0	8.9
12DS14_49a2.8124	0.01	0.1175	0.00	84.27	1961.1	21.2	1919.1	7.8
12DS14_50a2.9904	0.01	0.1119	0.01	79.27	1859.7	20.2	1830.2	9.1
12DS14_51a1.9027	0.01	0.1806	0.00	19.27	2722.7	16.9	2658.5	6.5
12DS14_53a1.8284	0.01	0.1886	0.00	59.27	2812.3	16.1	2730.3	5.0
12DS14_54a3.0118	0.01	0.1123	0.01	46.27	1848.2	12.9	1837.3	9.1
12DS14_55a1.8708	0.01	0.1842	0.00	85.27	2760.6	15.9	2690.7	5.2
12DS14_56a2.8218	0.01	0.1182	0.00	97.27	1955.5	13.0	1928.7	8.5
12DS14_57a2.7764	0.01	0.1183	0.00	96.27	1983.0	13.2	1930.7	7.4
12DS14_58a2.9952	0.01	0.1123	0.00	95.27	1857.1	12.0	1837.2	7.5
12DS14_59a2.9666	0.01	0.1133	0.00	76.27	1872.6	12.4	1853.2	7.4
12DS14_60a2.8474	0.01	0.1178	0.00	50.27	1940.3	12.3	1923.4	7.0
12DS14_61a1.9567	0.01	0.1819	0.01	82.27	2661.2	12.2	2670.6	8.9
12DS14_62a2.9890	0.01	0.1116	0.01	16.27	1860.4	10.1	1825.1	12.2
12DS14_63a2.9886	0.01	0.1114	0.01	6.27	1860.7	12.2	1823.2	14.2
12DS14_64a3.0103	0.01	0.1130	0.01	21.27	1849.0	10.1	1848.0	12.1
12DS14_65a2.8850	0.01	0.1165	0.01	70.27	1918.5	12.8	1902.5	14.5
12DS14_66a2.8349	0.01	0.1182	0.01	17.27	1947.7	8.9	1928.6	10.1
12DS14_67a1.8204	0.00	0.1888	0.01	69.27	2822.3	10.4	2731.6	8.6
12DS14_68a2.9523	0.01	0.1114	0.01	32.27	1880.5	10.0	1821.7	11.4
12DS14_69a2.9567	0.01	0.1121	0.01	55.27	1878.1	9.6	1833.6	12.2
12DS14_70a2.8386	0.01	0.1157	0.01	38.27	1945.5	10.9	1890.6	11.7
12DS14_71a3.0076	0.01	0.1115	0.01	57.27	1850.4	13.7	1823.8	12.1
12DS14_72a2.9529	0.01	0.1115	0.01	7.27	1880.2	14.3	1823.3	12.1
12DS14_74a3.0452	0.01	0.1122	0.01	61.27	1830.6	14.1	1836.2	11.7
12DS14_75a2.9231	0.01	0.1139	0.01	37.27	1896.8	14.5	1862.1	11.3
12DS14_77a2.9776	0.01	0.1125	0.01	64.27	1866.6	14.9	1840.2	12.8
12DS14_78a2.6107	0.01	0.1277	0.01	63.27	2090.4	14.9	2066.1	11.4
12DS14_79a2.1499	0.01	0.1525	0.01	11.27	2462.2	16.7	2373.6	10.0
12DS14_80a2.9022	0.01	0.1160	0.01	74.27	1908.6	15.6	1895.3	13.4
12DS14_81a1.9219	0.01	0.1845	0.01	39.27	2700.5	21.6	2693.4	8.9
12DS14_82a2.8740	0.01	0.1150	0.01	24.27	1924.8	16.0	1879.2	12.0

12DS14_84a	3.0425	0.01	0.1124	0.01	77.27	1832.0	16.1	1839.1	13.0
12DS14_85a	2.9592	0.01	0.1131	0.01	9.27	1876.7	15.1	1850.0	10.9
12DS14_86a	2.9085	0.01	0.1138	0.01	13.27	1905.0	14.7	1860.3	9.8
12DS14_87a	2.8775	0.01	0.1136	0.00	10.27	1922.7	13.5	1857.8	7.9
12DS14_89a	2.9309	0.01	0.1125	0.00	8.27	1892.4	13.7	1839.9	8.7
12DS14_90a	2.9224	0.01	0.1124	0.01	72.27	1897.2	14.1	1839.4	10.0
12DS14_91a	2.7642	0.01	0.1181	0.00	80.27	1990.6	13.4	1928.1	7.7
12DS14_92a	2.9697	0.01	0.1119	0.01	52.27	1870.9	15.6	1830.0	12.5
12DS14_93a	2.9187	0.01	0.1127	0.01	83.27	1899.3	14.8	1842.8	9.7
12DS14_94a	2.9267	0.01	0.1119	0.00	25.27	1894.8	12.8	1829.8	7.5
12DS14_95a	2.9542	0.01	0.1129	0.01	78.27	1879.4	14.5	1846.1	11.2
12DS14_96a	1.9082	0.01	0.1879	0.00	40.27	2716.3	19.1	2723.8	7.3
12DS14_97a	2.4856	0.01	0.1281	0.00	27.27	2179.7	13.4	2072.5	6.3
12DS14_98a	2.9526	0.01	0.1130	0.00	34.27	1880.3	12.3	1847.8	8.1
12DS14_99a	2.7936	0.01	0.1170	0.00	33.27	1972.5	13.4	1911.6	8.2
12DS14_100a	2.9934	0.01	0.1111	0.00	31.27	1858.1	12.4	1817.7	7.9
12DS14_101a	3.0049	0.01	0.1120	0.01	2.27	1851.9	16.4	1832.8	11.4
12DS14_102a	2.8546	0.01	0.1158	0.01	44.27	1936.1	19.4	1891.9	14.7
12DS14_103a	2.7510	0.01	0.1192	0.01	29.27	1998.8	17.7	1945.0	10.8
12DS14_104a	1.9341	0.01	0.1814	0.01	60.27	2686.6	24.0	2665.5	10.3
12DS14_105a	2.4577	0.01	0.1331	0.01	23.27	2200.7	19.2	2139.1	11.0
12DS14_106a	1.8999	0.01	0.1851	0.01	35.27	2726.1	23.8	2699.4	10.2
12DS14_107a	2.9033	0.01	0.1122	0.01	56.27	1908.0	18.5	1835.0	13.1
12DS14_108a	2.9824	0.01	0.1128	0.01	62.27	1864.0	17.6	1844.9	12.8
12DS14_109a	1.9131	0.01	0.1810	0.01	0.27	2710.7	23.1	2662.2	9.6
12DS14_110a	2.9818	0.01	0.1122	0.01	30.27	1864.4	18.7	1835.6	14.5

sample name	**238U 206Pb**	**1 sigma % error**	**207Pb 206Pb**	**1 sigma % error**	**Th U**	**206/238 age**	**1 sigma abs err**	**207/206 age**	**1 sigma abs err**

12DS16

< 10 % discordant

12DS16_2a5.1144	0.02	0.0773	0.01	1151.2	18.6	1127.9	12.0
12DS16_6a3.2809	0.02	0.1067	0.00	1715.0	26.1	1743.6	7.1
12DS16_7a2.2119	0.02	0.1620	0.00	2404.6	34.0	2476.2	5.3
12DS16_8a3.4054	0.02	0.1034	0.00	1659.8	25.7	1686.5	6.5
12DS16_9a3.3660	0.02	0.1066	0.00	1676.8	25.9	1742.3	6.3
12DS16_10a3.4929	0.02	0.1056	0.00	1623.0	24.6	1724.7	5.7
12DS16_11a3.3286	0.02	0.1057	0.00	1693.4	26.5	1727.2	7.7
12DS16_12a3.2314	0.02	0.1088	0.00	1738.1	26.9	1779.4	7.7
12DS16_13a3.1117	0.02	0.1094	0.00	1796.4	24.3	1789.6	6.3
12DS16_14a3.2500	0.02	0.1064	0.00	1729.4	23.6	1738.0	6.5
12DS16_15a3.2496	0.02	0.1071	0.00	1729.5	24.2	1750.2	8.9
12DS16_16a4.0089	0.02	0.0900	0.00	1435.6	19.7	1425.7	6.8
12DS16_17a3.1678	0.02	0.1094	0.00	1768.6	25.1	1789.1	7.9
12DS16_19a3.2627	0.02	0.1078	0.00	1723.5	24.8	1762.0	7.5
12DS16_20a4.1756	0.02	0.0903	0.00	1384.0	20.3	1431.7	8.0
12DS16_21a3.4398	0.02	0.1042	0.00	1645.1	23.7	1699.6	7.8
12DS16_22a3.3609	0.02	0.1052	0.00	1679.1	23.6	1717.9	7.0
12DS16_23a3.3192	0.02	0.1056	0.00	1697.6	24.6	1724.6	6.1
12DS16_24a3.3886	0.02	0.1060	0.01	1667.0	25.4	1731.7	10.1
12DS16_26a3.2808	0.01	0.1067	0.00	1715.1	14.2	1743.5	8.7
12DS16_27a2.9859	0.01	0.1147	0.00	1862.1	14.8	1875.2	6.4
12DS16_28a3.3247	0.01	0.1046	0.01	1695.2	15.9	1707.2	10.5
12DS16_29a5.1705	0.01	0.0780	0.01	1139.8	11.5	1148.0	13.9
12DS16_30a3.1359	0.01	0.1112	0.00	1784.3	14.4	1819.4	6.1
12DS16_32a3.0198	0.01	0.1170	0.00	1843.9	15.1	1911.5	7.7
12DS16_36a3.3110	0.01	0.1045	0.01	1701.3	13.9	1706.3	9.2
12DS16_37a4.1762	0.01	0.0910	0.01	1383.9	15.6	1446.4	12.0
12DS16_38a3.5134	0.01	0.1055	0.01	1614.6	17.7	1723.5	10.7
12DS16_39a4.1428	0.01	0.0910	0.01	1393.9	15.5	1445.9	12.9
12DS16_40a4.1184	0.01	0.0901	0.01	1401.3	13.8	1427.1	11.4
12DS16_41a4.8139	0.02	0.0807	0.01	1216.7	17.0	1213.5	18.0
12DS16_42a2.1599	0.01	0.1617	0.01	2452.7	23.6	2473.6	8.9

12DS16_44a5.3815	0.01	0.0762	0.01	1098.7	11.2	1101.0	13.4
12DS16_45a3.1810	0.01	0.1047	0.01	1762.2	17.2	1708.4	10.6
12DS16_46a2.3285	0.01	0.1567	0.01	2303.3	22.9	2420.6	9.2
12DS16_47a3.2296	0.01	0.1065	0.01	1738.9	17.7	1740.3	11.3
12DS16_48a3.2561	0.01	0.1056	0.01	1726.5	16.4	1724.8	10.2
12DS16_48b3.2973	0.01	0.1055	0.01	1707.6	16.6	1722.6	10.8
12DS16_49a3.2519	0.01	0.1053	0.01	1728.5	17.1	1720.1	11.7
12DS16_50a3.3595	0.01	0.1048	0.01	1679.7	17.0	1711.3	11.5
12DS16_50b3.2239	0.01	0.1048	0.01	1741.6	16.5	1710.5	11.1
12DS16_51a3.1423	0.01	0.1094	0.01	1781.1	16.6	1789.0	10.7
12DS16_52a3.2652	0.01	0.1068	0.01	1722.3	17.5	1745.6	10.7
12DS16_53a3.2797	0.01	0.1048	0.01	1715.6	17.6	1711.2	10.8
12DS16_55a3.3794	0.01	0.1053	0.01	1671.0	17.7	1719.0	12.4
12DS16_56a3.0719	0.01	0.1086	0.01	1816.7	21.3	1775.5	14.3
12DS16_57a4.3679	0.01	0.0857	0.01	1328.9	16.0	1332.0	15.9
12DS16_58a3.3132	0.01	0.1060	0.01	1700.3	17.9	1732.0	11.4
12DS16_59a1.9875	0.01	0.1818	0.01	2627.2	25.4	2669.1	9.8
12DS16_60a4.3094	0.01	0.0879	0.01	1345.2	14.3	1380.7	13.4
12DS16_61a3.2253	0.02	0.1089	0.00	1740.9	37.8	1780.3	7.8
12DS16_62a3.2937	0.02	0.1062	0.00	1709.2	37.4	1735.7	7.8
12DS16_63a3.0928	0.02	0.1123	0.00	1806.0	38.6	1836.9	5.3
12DS16_64a1.5607	0.02	0.2699	0.00	3192.0	62.5	3305.3	4.7
12DS16_65a3.2386	0.02	0.1046	0.00	1734.7	37.3	1708.1	7.2
12DS16_67a3.3255	0.02	0.1053	0.00	1694.8	36.7	1720.2	7.7
12DS16_68a3.2564	0.02	0.1051	0.00	1726.4	36.6	1716.4	6.1
12DS16_69a3.0839	0.02	0.1129	0.00	1810.5	38.7	1846.0	7.0
12DS16_70a3.1311	0.02	0.1095	0.00	1786.7	38.0	1791.4	5.3
12DS16_71a3.1982	0.02	0.1059	0.00	1753.8	37.1	1730.5	6.2
12DS16_72a3.3216	0.02	0.1121	0.00	1696.6	36.2	1833.6	5.3
12DS16_73a3.1544	0.03	0.1124	0.00	1775.1	38.8	1839.0	8.5
12DS16_74a3.3673	0.03	0.1032	0.00	1676.3	37.5	1682.1	9.1
12DS16_75a3.1509	0.03	0.1065	0.01	1776.9	39.8	1740.7	12.1

12DS16_76a	3.2632	0.02	0.1080	0.00		1723.2	37.4	1766.3	7.7
12DS16_77a	3.2668	0.03	0.1067	0.00		1721.5	38.2	1743.9	8.7
12DS16_80a	3.2566	0.03	0.1046	0.01		1726.3	38.0	1706.8	9.3
12DS16_82a	1.9604	0.03	0.1812	0.00		2657.1	54.4	2663.8	7.3
12DS16_83a	2.0808	0.03	0.1672	0.00		2529.8	52.8	2530.1	7.3
12DS16_84a	3.2724	0.03	0.1093	0.00		1719.0	38.2	1788.4	8.1
12DS16_85a	5.2461	0.02	0.0777	0.01		1124.7	22.0	1140.4	14.3
12DS16_87a	3.0587	0.02	0.1140	0.00		1823.5	33.2	1863.6	7.1
12DS16_88a	5.4415	0.02	0.0768	0.01		1087.6	21.6	1115.7	11.5
12DS16_89a	3.3177	0.02	0.1064	0.00		1698.3	31.8	1739.0	8.8
12DS16_90a	3.2154	0.02	0.1050	0.01		1745.6	33.0	1714.6	9.2
12DS16_91a	3.3925	0.02	0.1065	0.00		1665.3	31.4	1740.5	9.0
12DS16_94a	3.3673	0.02	0.1052	0.00		1676.3	30.5	1718.4	8.5
12DS16_95a	3.1811	0.02	0.1099	0.00		1762.1	32.9	1797.1	8.5
12DS16_98a	2.9394	0.02	0.1137	0.01		1887.7	26.2	1859.7	11.3
12DS16_100a	3.2150	0.01	0.1052	0.00		1745.8	22.8	1718.5	6.9
12DS16_101a	3.2875	0.02	0.1053	0.00		1712.0	23.5	1718.8	7.6
12DS16_102a	3.2259	0.02	0.1071	0.00		1740.6	22.9	1751.5	7.7
12DS16_104a	3.0904	0.02	0.1082	0.01		1807.2	24.8	1769.4	9.2
12DS16_106a	3.3577	0.01	0.1040	0.00		1680.5	21.6	1696.3	7.1
12DS16_107a	3.3423	0.01	0.1047	0.00		1687.3	21.9	1709.4	7.3
12DS16_108a	3.5881	0.02	0.1043	0.00		1584.8	21.7	1702.9	8.7
12DS16_111a	2.1908	0.01	0.1606	0.00		2423.9	14.9	2462.3	6.0
12DS16_113a	3.5498	0.01	0.0991	0.00		1599.9	12.2	1607.9	9.3
12DS16_114a	5.3510	0.01	0.0774	0.01		1104.5	10.1	1131.5	11.4
12DS16_115a	3.3689	0.01	0.1062	0.00		1675.6	13.0	1735.7	8.8
12DS16_116a	5.3660	0.01	0.0789	0.01		1101.6	13.3	1169.3	23.1
12DS16_118a	1.9378	0.01	0.1915	0.00		2682.4	22.1	2755.2	6.9
12DS16_119a	3.2835	0.01	0.1059	0.00		1713.8	14.0	1729.7	7.8
12DS16_120a	3.4694	0.01	0.1036	0.01		1632.7	18.4	1689.5	9.8
> 10 % discordant									
12DS16_4a	2.6587	0.02	0.1803	0.01		2058.1	39.9	2655.3	9.6

12DS16_31a	6.4146	0.01	0.0780	0.01		933.9	11.1	1145.8	14.8
12DS16_34a	12.5929	0.01	0.0586	0.01		492.6	5.3	552.0	20.0
12DS16_35a	4.0201	0.01	0.1100	0.01		1432.0	13.7	1799.7	12.5
12DS16_86a	5.1723	0.02	0.0903	0.00		1139.4	23.0	1431.8	8.8
12DS16_92a	13.3890	0.02	0.0577	0.01		464.3	9.7	519.1	16.5
12DS16_93a	13.1886	0.02	0.0741	0.01		471.1	10.5	1045.2	25.1
12DS16_99a	3.8663	0.02	0.1026	0.00		1482.9	20.3	1671.3	6.1
12DS16_105a	2.6712	0.02	0.2135	0.00		2049.9	26.9	2932.4	5.2
12DS16_109a	9.6432	0.01	0.0808	0.01		636.1	7.2	1216.7	16.1
12DS16_110a	4.0278	0.01	0.1072	0.01		1429.6	10.9	1752.7	9.6
12DS16_112a	4.0793	0.01	0.1077	0.00		1413.4	11.1	1761.2	9.0
12DS16_117a	2.3298	0.01	0.1814	0.00		2302.2	23.7	2665.4	6.4

sample name	**238U 206Pb**	**1 sigma % error**	**207Pb 206Pb**	**1 sigma % error**	**Th U**	**206/238 age**	**1 sigma abs err**	**207/206 age**	**1 sigma abs err**
12DS19									
< 10 % discordant									
12DS19_2a	3.1763	0.04	0.1123	0.01		1764.5	61.0	1836.6	21.7
12DS19_6a	3.5906	0.03	0.1065	0.00		1583.8	47.1	1740.3	8.3
12DS19_7a	3.2742	0.04	0.1096	0.01		1718.1	53.1	1792.1	13.8
12DS19_8a	3.2841	0.03	0.1124	0.01		1713.6	50.9	1837.9	10.0
12DS19_14a	3.3447	0.03	0.1081	0.00		1686.2	42.0	1767.0	8.9
12DS19_15a	3.2131	0.03	0.1114	0.01		1746.7	44.8	1821.6	11.9
12DS19_22a	3.1209	0.03	0.1120	0.01	0.34	1791.8	44.6	1832.8	10.6
12DS19_24a	2.2123	0.03	0.1694	0.00		2404.2	57.2	2551.8	8.1
12DS19_28a	3.1953	0.02	0.1087	0.01		1755.3	32.4	1777.4	22.6
12DS19_29a	3.2343	0.02	0.1110	0.01		1736.7	25.2	1816.3	15.4
12DS19_38a	3.2041	0.01	0.1100	0.01		1751.1	22.2	1798.6	17.2
12DS19_40a	3.0592	0.01	0.1123	0.01	0.27	1823.3	22.5	1837.7	16.5
12DS19_41a	3.4843	0.01	0.1076	0.01	0.34	1626.5	19.5	1759.8	15.0
12DS19_44a	3.2831	0.01	0.1084	0.01		1714.0	20.9	1772.3	14.8

12DS19_45a	3.2860	0.01	0.1079	0.01		1712.7	21.3	1764.9	16.0
12DS19_48a	1.5623	0.01	0.2669	0.01		3189.4	36.3	3288.2	13.0
12DS19_51a	3.4757	0.02	0.1076	0.00	0.36	1630.1	22.5	1758.6	8.6
12DS19_53a	3.3220	0.02	0.1113	0.01		1696.4	25.9	1820.4	11.9
12DS19_54a	3.2416	0.02	0.1117	0.01		1733.3	23.5	1828.0	9.6
12DS19_55a	3.5635	0.02	0.1078	0.01		1594.5	23.4	1763.2	9.2
12DS19_57a	3.5078	0.02	0.1060	0.00		1616.9	22.3	1732.0	8.5
12DS19_58a	3.3574	0.02	0.1049	0.01		1680.6	23.3	1713.2	9.2
12DS19_77a	3.2827	0.02	0.1084	0.00		1714.2	25.8	1771.9	8.9
12DS19_78a	3.5597	0.02	0.1068	0.00		1596.0	25.0	1746.3	8.2
12DS19_79a	3.2968	0.02	0.1123	0.01		1707.8	26.2	1837.1	10.2
12DS19_81a	3.1185	0.02	0.1134	0.00		1793.0	27.5	1854.4	8.8
12DS19_83a	3.4841	0.02	0.1074	0.00		1626.6	25.0	1755.5	9.1
12DS19_84a	3.3314	0.02	0.1091	0.01		1692.2	28.5	1785.3	13.0
12DS19_86a	3.3944	0.01	0.1071	0.00		1664.5	15.1	1750.3	6.8
12DS19_87a	3.2340	0.01	0.1089	0.00		1736.9	16.1	1781.1	8.2
12DS19_88a	2.4036	0.01	0.1594	0.00		2242.5	19.3	2449.8	6.4
12DS19_89a	3.4736	0.01	0.1054	0.00		1630.9	13.4	1721.5	5.8
12DS19_91a	3.4353	0.01	0.1083	0.00		1647.0	12.1	1770.9	6.1
12DS19_92a	2.2066	0.01	0.1697	0.00		2409.4	21.0	2554.6	7.2
12DS19_93a	2.0776	0.01	0.1877	0.00		2533.0	18.6	2722.3	5.1
12DS19_94a	3.3564	0.01	0.1089	0.01		1681.1	18.6	1781.5	12.7
12DS19_97a	3.2885	0.01	0.1120	0.00		1711.6	20.5	1831.3	7.8
12DS19_98a	3.4177	0.01	0.1081	0.01		1654.5	19.8	1767.3	9.4
12DS19_99a	3.3733	0.01	0.1088	0.00		1673.7	19.4	1778.9	7.8
12DS19_100a	3.2700	0.01	0.1094	0.01		1720.0	21.9	1790.0	13.1
12DS19_101a	2.1924	0.01	0.1768	0.00		2422.4	26.4	2623.5	6.6
12DS19_102a	3.5433	0.01	0.1053	0.00		1602.6	20.0	1719.8	8.8
12DS19_103a	3.2122	0.02	0.1138	0.01		1747.2	25.2	1861.5	14.2
12DS19_105a	3.4000	0.02	0.1094	0.01		1662.1	33.1	1789.4	23.8
12DS19_109a	3.0821	0.01	0.1170	0.00		1811.5	19.7	1911.1	7.8
12DS19_111a	3.2274	0.01	0.1089	0.01		1740.0	18.3	1780.5	10.1

12DS19_114a	3.0844	0.01	0.1128	0.01		1810.3	18.9	1844.2	9.4
12DS19_116a	2.0903	0.01	0.1708	0.01		2520.2	27.5	2565.7	8.7
12DS19_119a	3.2985	0.01	0.1124	0.00		1707.0	16.6	1838.0	7.9
> 10 % discordant									
12DS19_1a4.0778	0.03	0.1087	0.01		1413.8	43.8	1778.2	14.1	
12DS19_3a2.3557	0.03	0.1721	0.00		2280.9	64.9	2578.5	7.4	
12DS19_4a9.0134	0.03	0.1403	0.01		678.2	22.1	2230.4	10.1	
12DS19_9a3.8355	0.03	0.1072	0.00		1493.5	44.5	1752.0	7.8	
12DS19_21a3.6580	0.03	0.1077	0.01		1557.9	39.7	1760.4	9.9	
12DS19_23a3.9588	0.03	0.1086	0.00		1451.9	38.0	1776.9	8.9	
12DS19_27a2.3187	0.02	0.2115	0.01		2311.5	33.1	2916.7	12.3	
12DS19_31a3.6719	0.02	0.1103	0.01		1552.7	21.3	1804.1	14.0	
12DS19_34a2.1825	0.01	0.1900	0.01		2431.5	29.8	2742.0	12.0	
12DS19_42a3.8724	0.01	0.1078	0.01		1480.8	17.5	1762.7	14.6	
12DS19_46a3.6524	0.01	0.1093	0.01		1560.0	19.9	1787.5	16.5	
12DS19_49a22.31240.03		0.1131	0.01		282.6	9.5	1850.5	17.2	
12DS19_50a3.7934	0.02	0.1125	0.00		1508.3	22.0	1840.1	8.5	
12DS19_56a20.46610.02		0.0955	0.01		307.5	6.7	1538.2	10.5	
12DS19_59a3.8016	0.02	0.1119	0.00		1505.4	26.3	1831.1	8.9	
12DS19_60a3.8991	0.02	0.1568	0.01		1471.7	23.6	2421.5	8.6	
12DS19_73a3.4889	0.02	0.1115	0.01		1624.6	25.2	1824.6	10.2	
12DS19_74a3.8073	0.02	0.1059	0.00		1503.4	23.3	1730.5	9.0	
12DS19_76a3.7341	0.02	0.1185	0.01		1529.7	26.4	1933.9	13.5	
12DS19_80a4.1420	0.02	0.1084	0.00		1394.1	22.1	1773.3	9.0	
12DS19_95a77.25610.02		0.0801	0.01		82.9	1.4	1199.8	24.1	
12DS19_96a3.6193	0.01	0.1095	0.00		1572.7	13.9	1790.5	8.3	
12DS19_104a	4.2276	0.01	0.1075	0.00		1368.7	17.8	1758.2	7.7
12DS19_110a	6.8273	0.02	0.1718	0.01		881.1	16.7	2575.6	8.5
12DS19_112a	5.0848	0.01	0.1043	0.00		1157.4	13.1	1702.4	8.6
12DS19_115a	2.5581	0.01	0.1524	0.01		2127.1	25.2	2373.5	9.1
12DS19_117a	3.5200	0.01	0.1137	0.00		1611.9	19.2	1859.0	8.8

sample name	238U 206Pb	1 sigma % error	207Pb 206Pb	1 sigma % error	Th U	206/238 age	1 sigma abs err	207/206 age	1 sigma abs err
12DS24									
< 10 % discordant									
12DS24_2a	2.5543	0.01	0.1350	0.01	2.27	2129.8	18.6	2164.2	11.7
12DS24_5a	1.8357	0.01	0.1948	0.00	0.27	2803.3	19.0	2783.3	8.0
12DS24_14a	3.2405	0.01	0.1086	0.01	40.27	1733.8	10.5	1776.2	10.2
12DS24_18a	3.3204	0.01	0.1087	0.01	39.27	1697.1	10.7	1777.5	10.8
12DS24_19a	3.5795	0.01	0.1050	0.01	38.27	1588.2	10.5	1714.8	10.4
12DS24_20a	3.2548	0.01	0.1122	0.01	37.27	1727.1	10.3	1835.3	10.2
12DS24_23a	3.0810	0.01	0.1115	0.01	35.27	1812.0	20.2	1824.4	10.0
12DS24_24a	3.2321	0.01	0.1083	0.00	34.27	1737.7	18.4	1771.4	8.3
12DS24_25a	1.7581	0.01	0.2170	0.01	33.27	2902.9	34.4	2958.8	9.3
12DS24_26a	2.6815	0.02	0.1392	0.01	32.27	2043.2	34.1	2217.4	16.9
12DS24_29a	3.2277	0.01	0.1084	0.01	31.27	1739.8	19.3	1772.5	9.4
12DS24_30a	2.9354	0.01	0.1112	0.01	30.27	1889.9	22.5	1819.3	9.1
12DS24_31a	3.3689	0.02	0.1041	0.01	29.27	1675.6	23.3	1698.6	18.6
12DS24_33a	3.2700	0.01	0.1119	0.01	28.27	1720.1	21.9	1830.9	14.8
12DS24_34a	1.8052	0.01	0.2102	0.01	27.27	2841.6	33.2	2907.5	12.9
12DS24_36a	3.3178	0.01	0.1065	0.01	25.27	1698.3	22.3	1741.1	15.5
12DS24_38a	1.6168	0.01	0.2599	0.01	24.27	3104.0	35.2	3246.3	12.5
12DS24_39a	1.7442	0.01	0.2148	0.01	23.27	2921.5	34.0	2942.0	12.9
12DS24_40a	3.4230	0.02	0.1047	0.01	22.27	1652.2	22.5	1709.0	16.7
12DS24_41a	3.6764	0.01	0.1043	0.01	21.27	1551.0	16.1	1701.6	17.4
12DS24_44a	3.2525	0.01	0.1090	0.01	18.27	1728.2	18.1	1782.7	17.2
12DS24_46a	2.5615	0.02	0.1480	0.01	17.27	2124.7	27.4	2323.0	16.5
12DS24_47a	3.4533	0.01	0.1110	0.01	16.27	1639.4	20.1	1815.7	17.8
12DS24_48a	1.8662	0.01	0.2109	0.01	15.27	2766.1	27.5	2912.3	15.2
12DS24_49a	3.2077	0.01	0.1088	0.01	14.27	1749.3	18.0	1778.6	17.3
12DS24_50a	3.2900	0.01	0.1084	0.01	13.27	1710.9	17.3	1772.1	17.2
12DS24_54a	2.4889	0.02	0.1556	0.01	6.27	2177.3	29.6	2408.6	16.8

12DS24_55a2.1995	0.02	0.1728	0.01	7.27	2415.9	32.3	2585.4	16.3	
12DS24_56a2.0518	0.02	0.1793	0.01	8.27	2559.3	33.2	2646.8	16.1	
12DS24_58a3.3439	0.02	0.1075	0.01	9.27	1686.6	23.8	1756.9	18.3	
12DS24_59a3.1276	0.02	0.1131	0.01	10.27	1788.4	25.3	1850.1	18.6	
12DS24_60a3.2302	0.02	0.1125	0.01	11.27	1738.6	23.9	1840.1	17.8	
12DS24_62a3.2138	0.01	0.1133	0.01	67.27	1746.4	21.0	1852.9	12.5	
12DS24_65a3.5768	0.01	0.1079	0.01	65.27	1589.3	19.7	1764.7	13.7	
12DS24_66a2.7208	0.01	0.1329	0.01	64.27	2017.8	23.6	2136.9	12.0	
12DS24_68a3.3418	0.01	0.1092	0.01	63.27	1687.5	20.3	1786.7	13.1	
12DS24_69a1.4928	0.01	0.2715	0.01	62.27	3305.4	35.1	3314.4	10.7	
12DS24_70a3.3630	0.01	0.1092	0.01	61.27	1678.2	20.3	1785.9	13.2	
12ds24_72a2.1522	0.01	0.1628	0.01	60.27	2460.0	23.9	2485.4	12.5	
12ds24_76a2.5264	0.02	0.1475	0.01	58.27	2149.8	27.8	2317.2	13.5	
12ds24_77a3.3899	0.02	0.1093	0.01	57.27	1666.4	23.4	1788.1	15.0	
12ds24_79a1.8455	0.01	0.1977	0.01	56.27	2791.2	32.3	2807.1	12.7	
12ds24_80a3.3545	0.02	0.1111	0.01	55.27	1681.9	26.4	1818.0	15.1	
12Ds24_81a3.2070	0.01	0.1118	0.00	54.27	1749.6	12.6	1828.5	6.2	
12DS24_84a1.7531	0.01	0.2216	0.00	52.27	2909.6	24.3	2992.6	6.8	
12DS24_87a1.7927	0.01	0.2487	0.00	50.27	2857.7	19.8	3176.2	5.4	
12DS24_97a3.1932	0.01	0.1089	0.00	44.27	1756.3	10.7	1780.9	8.9	
12DS24_103a	3.0501	0.01	0.1150	0.00	83.27	1828.0	15.6	1879.2	7.8
12DS24_104a	3.2305	0.01	0.1182	0.00	82.27	1738.5	14.9	1929.1	7.0
12DS24_110a	3.4064	0.01	0.1047	0.00	80.27	1659.3	19.6	1709.6	8.4
12DS24_112a	2.6995	0.01	0.1288	0.00	78.27	2031.5	20.8	2081.6	7.4
12DS24_113a	4.1249	0.01	0.0916	0.01	77.27	1399.3	16.1	1459.1	11.3
12DS24_120a	3.3385	0.01	0.1092	0.00	74.27	1689.0	11.3	1785.6	7.5
12DS24_122a	3.0940	0.01	0.1140	0.00	72.27	1805.4	12.2	1864.6	6.7
12DS24_124a	3.4772	0.01	0.1092	0.00	70.27	1629.5	12.3	1785.9	7.3
12DS24_128a	3.5972	0.01	0.1058	0.00	69.27	1581.3	11.2	1728.6	5.6
> 10 % discordant									
12DS24_1a45.7712	0.01	0.0785	0.01	3.27	139.3	1.4	1160.1	13.1	
12DS24_4a4.5180	0.01	0.1076	0.00	1.27	1288.9	10.4	1759.2	9.0	

12DS24_11a	4.4359	0.01	0.1446	0.01	43.27	1310.5	14.3	2282.8	11.8
12DS24_12a	3.5672	0.01	0.1382	0.01	41.27	1593.0	11.6	2205.0	18.2
12DS24_13a	2.2329	0.01	0.2533	0.01	42.27	2385.7	20.2	3205.4	8.6
12DS24_21a	71.1972	0.01	0.0542	0.01	36.27	89.9	1.2	377.6	22.2
12DS24_35a	2.3520	0.02	0.1887	0.01	26.27	2283.9	28.8	2730.8	13.6
12DS24_42a	3.8335	0.01	0.1051	0.01	20.27	1494.2	15.6	1715.5	17.3
12DS24_43a	2.0713	0.01	0.2116	0.01	19.27	2539.4	24.9	2918.0	15.2
12DS24_51a	29.6710	0.19	0.1111	0.01	12.27	213.7	39.3	1818.3	21.9
12DS24_52a	2.5874	0.02	0.1676	0.01	6.27	2106.5	29.1	2533.8	16.2
12DS24_53a	3.5099	0.02	0.1559	0.01	5.27	1616.0	22.7	2411.3	16.5
12DS24_64a	13.0735	0.01	0.1044	0.01	66.27	475.1	6.8	1704.3	13.8
12ds24_73a	3.6928	0.01	0.1082	0.01	59.27	1544.9	16.2	1769.5	14.0
12DS24_82a	3.8350	0.01	0.1086	0.00	53.27	1493.7	11.5	1776.1	7.4
12DS24_85a	3.6895	0.01	0.1105	0.00	51.27	1546.1	10.9	1806.9	6.3
12DS24_89a	3.6938	0.01	0.1124	0.00	49.27	1544.5	12.0	1838.2	7.0
12DS24_90a	2.4522	0.01	0.2268	0.00	48.27	2204.9	18.6	3029.6	6.5
12DS24_91a	5.1948	0.01	0.1094	0.01	47.27	1134.9	12.0	1790.2	10.2
12DS24_92a	3.6521	0.01	0.1086	0.00	46.27	1560.1	9.4	1775.4	8.5
12DS24_93a	3.9629	0.01	0.1454	0.00	45.27	1450.5	8.3	2292.9	7.9
12DS24_101a	3.5807	0.01	0.1102	0.00	85.27	1587.7	14.7	1802.0	8.6
12DS24_102a	2.1946	0.01	0.2056	0.00	84.27	2420.4	19.3	2871.5	5.6
12DS24_107a	-204.3399	0.33	0.0790	0.01	81.27	-31.6	-10.4	1171.0	26.2
12DS24_111a	3.8345	0.01	0.1080	0.00	79.27	1493.9	14.9	1765.5	7.7
12DS24_119a	4.1566	0.01	0.1083	0.00	75.27	1389.7	10.3	1771.2	9.1
12DS24_121a	2.8590	0.01	0.1596	0.00	73.27	1933.5	11.8	2451.2	4.1
12DS24_123a	2.9659	0.01	0.1636	0.00	71.27	1873.0	12.1	2492.9	4.5
12DS24_130a	4.0271	0.01	0.1107	0.00	68.27	1429.8	10.8	1810.4	5.7

sample name	**238U 206Pb**	**1 sigma % error**	**207Pb 206Pb**	**1 sigma % error**	**Th U**	**206/238 age**	**1 sigma abs err**	**207/206 age**	**1 sigma abs err**

12DS33

< 10 % discordant

12DS33_1a3.3355	0.01	0.1045	0.01		1690.3	20.1	1703.6	8.4
12DS33_5a2.2286	0.01	0.1628	0.01		2389.5	27.7	2482.7	8.1
12DS33_9a1.7733	0.02	0.2163	0.01		2882.8	39.7	2954.2	9.8
12DS33_10a3.3606	0.01	0.1062	0.01		1679.2	21.4	1733.4	9.9
12DS33_12a3.3157	0.01	0.1097	0.01		1699.2	22.1	1794.8	10.4
12DS33_13a12.5148	0.01	0.0583	0.01		495.6	6.7	544.6	19.3
12DS33_16a13.1429	0.01	0.0566	0.01		472.7	6.4	479.6	19.5
12DS33_17a12.8081	0.01	0.0573	0.01		484.6	6.7	506.5	21.1
12DS33_20a5.5209	0.02	0.0759	0.01		1073.1	18.0	1095.8	26.8
12DS33_21a12.8563	0.01	0.0574	0.01		482.9	6.3	510.3	13.9
12DS33_22a12.3737	0.01	0.0582	0.01		501.0	6.8	540.0	24.8
12DS33_23a2.0239	0.01	0.1731	0.01		2588.4	27.3	2590.0	9.1
12DS33_24a3.3289	0.01	0.1050	0.01		1693.3	20.7	1717.0	11.4
12DS33_25a3.8904	0.01	0.0934	0.01		1474.7	17.0	1498.5	10.6
12DS33_31a3.6227	0.03	0.1056	0.00	0.23	1571.4	38.6	1729.9	11.3
12DS33_36a3.5268	0.03	0.1064	0.00	0.34	1609.2	38.6	1747.0	9.8
12DS33_38a3.4051	0.02	0.1044	0.00	0.33	1659.9	30.4	1716.9	11.1
12DS33_39a1.9134	0.02	0.1936	0.00	0.30	2710.3	44.5	2778.3	9.2
12DS33_40a3.4683	0.02	0.1055	0.00	0.27	1633.2	29.0	1727.1	11.6
12DS33_43a3.4523	0.02	0.1058	0.00	0.20	1639.8	28.5	1738.3	10.2
12DS33_45a12.4762	0.02	0.0565	0.01	0.36	497.0	9.9	490.7	23.2
12DS33_46a3.2388	0.02	0.1072	0.00	0.34	1734.6	30.1	1758.7	10.1
12DS33_50a2.4868	0.02	0.1519	0.00	0.37	2178.8	36.2	2371.3	8.8
12DS33_52a3.1437	0.02	0.1145	0.01		1780.4	26.8	1875.5	9.6
12DS33_53a12.7648	0.02	0.0570	0.01		486.2	8.8	494.7	19.3
12DS33_57a13.9834	0.02	0.0538	0.01		445.3	8.6	427.9	35.3
12DS33_58a3.9614	0.02	0.0927	0.01		1451.0	23.6	1481.0	10.3
12DS33_61a12.5914	0.02	0.0573	0.01		492.7	8.5	506.6	18.3
12DS33_65a3.4360	0.01	0.1044	0.01		1646.7	15.4	1703.6	10.6
12DS33_69a1.9260	0.01	0.1860	0.01		2695.8	23.4	2705.1	9.6
12DS33_70a3.3448	0.01	0.1035	0.01		1686.2	15.8	1690.9	11.6

12DS33_73a	12.9645	0.01	0.0572	0.01	479.0	4.9	504.8	18.7
12DS33_74a	12.6877	0.01	0.0565	0.01	489.1	5.8	487.4	27.0
12DS33_77a	12.2965	0.01	0.0566	0.01	504.0	5.0	486.2	13.1
12DS33_79a	2.0089	0.01	0.1855	0.00	2604.2	24.3	2699.8	8.0
12DS33_81a	3.3553	0.01	0.1052	0.00	1681.6	16.1	1718.2	10.2
12DS33_83a	3.3594	0.01	0.1040	0.01	1679.8	17.0	1697.2	10.7
12DS33_84a	4.3595	0.01	0.0881	0.01	1331.3	15.6	1387.3	15.6
12DS33_85a	3.3027	0.01	0.1138	0.00	1705.1	17.0	1857.9	9.2
12DS33_86a	1.7905	0.01	0.2243	0.00	2860.4	29.6	3011.0	9.0
12DS33_88a	3.2085	0.02	0.1112	0.01	1748.9	31.4	1808.5	9.0
12DS33_89a	3.2626	0.02	0.1091	0.01	1723.5	32.3	1782.7	12.6
12DS33_90a	3.2712	0.02	0.1075	0.01	1719.5	31.6	1755.7	11.1
12DS33_91a	2.4416	0.02	0.1530	0.01	2213.0	38.2	2355.2	8.2
12DS33_92a	12.9730	0.02	0.0560	0.01	478.7	10.0	476.1	21.6
12DS33_93a	2.1047	0.02	0.1749	0.01	2506.0	41.9	2597.3	7.5
12DS33_94a	3.3458	0.02	0.1046	0.01	1685.8	30.2	1694.9	9.3
12DS33_95a	12.7779	0.02	0.0578	0.01	485.7	10.0	513.3	17.0
12DS33_98a	13.5472	0.02	0.0569	0.01	459.1	9.6	489.5	22.7
12DS33_100a	12.6171	0.02	0.0566	0.01	491.7	10.3	529.5	36.8
12DS33_101a	4.2083	0.02	0.0930	0.01	1374.3	25.2	1492.0	13.3
12DS33_102a	3.3348	0.02	0.1058	0.01	1690.6	30.4	1728.9	12.2
12DS33_103a	3.4303	0.02	0.1058	0.01	1649.1	29.2	1722.1	10.7
12DS33_104a	12.1937	0.02	0.0571	0.01	508.1	9.8	496.8	15.6
12DS33_105a	2.0061	0.02	0.1772	0.01	2607.3	42.2	2622.9	8.8
12DS33_106a	12.6231	0.02	0.0572	0.01	491.5	9.5	508.3	19.3
12DS33_107a	3.2550	0.02	0.1048	0.01	1727.0	30.5	1714.4	10.6
12DS33_110a	1.9018	0.02	0.1861	0.01	2723.8	45.0	2703.5	9.2
12DS33_111a	1.7074	0.02	0.2541	0.01	2972.0	50.7	3206.3	9.1
12DS33_112a	3.5913	0.02	0.1064	0.01	1583.6	30.4	1750.5	16.2
12DS33_113a	3.2987	0.01	0.1069	0.01	1706.9	11.3	1747.9	11.2
12DS33_114a	13.0457	0.01	0.0577	0.01	476.1	3.7	515.2	19.6
12DS33_115a	3.4328	0.01	0.1041	0.01	1648.0	13.2	1698.2	12.4

>10& discordant

12DS33_2a	1.8496	0.02	0.2607	0.01		2786.2	51.0	3275.2	8.8
12DS33_6a	5.6493	0.05	0.1967	0.01		1050.6	51.0	2796.8	7.5
12DS33_7a	6.4036	0.03	0.1130	0.01		935.4	22.6	1838.8	11.6
12DS33_8a	9.4630	0.04	0.1768	0.03		647.6	22.3	2621.5	41.4
12DS33_14a	4.3415	0.02	0.1044	0.01		1336.2	21.3	1706.7	10.7
12DS33_15a	3.3703	0.05	0.1986	0.01		1675.0	69.4	2817.0	9.2
12DS33_26a	13.3894	0.03	0.0578	0.01		464.3	12.5	529.5	21.7
12DS33_27a	13.1918	0.03	0.0575	0.01		471.0	13.1	541.7	37.3
12DS33_28a	5.2214	0.07	0.1749	0.01		1129.6	70.5	2617.2	11.1
12DS33_29a	3.9861	0.03	0.1025	0.01		1443.0	35.8	1679.6	12.9
12DS33_30a	2.6165	0.03	0.1538	0.00	0.27	2086.5	48.8	2397.5	9.5
12DS33_32a	2.3940	0.03	0.1881	0.00	0.29	2250.1	55.7	2733.3	8.5
12DS33_35a	2.8969	0.03	0.2511	0.00	0.35	1911.6	55.2	3123.1	12.3
12DS33_37a	5.0588	0.03	0.1043	0.00	0.37	1162.8	29.8	1696.5	10.0
12DS33_41a	2.6203	0.02	0.1710	0.00	0.25	2083.9	37.8	2575.0	9.1
12DS33_42a	2.3105	0.03	0.1858	0.00	0.23	2318.3	59.1	2711.0	9.6
12DS33_47a	12.6597	0.02	0.0578	0.01	0.40	490.1	10.2	546.2	29.0
12DS33_49a	2.2508	0.02	0.1865	0.00	0.39	2369.8	42.8	2717.4	8.5
12DS33_54a	14.9882	0.02	0.0606	0.01		416.4	7.5	633.4	22.9
12DS33_56a	2.2928	0.02	0.2218	0.01		2333.4	38.0	2742.0	18.8
12DS33_62a	3.3861	0.02	0.1066	0.01		1668.1	26.2	1853.8	15.4
12DS33_63a	2.8046	0.02	0.1534	0.01		1965.8	35.9	2384.0	9.3
12DS33_64a	2.6656	0.01	0.1686	0.01		2053.6	19.0	2547.1	8.7
12DS33_66a	2.2177	0.01	0.1908	0.01		2399.3	21.2	2750.8	8.5
12DS33_68a	12.5327	0.01	0.0577	0.01		494.9	5.9	955.9	39.0
12DS33_71a	2.6412	0.01	0.1552	0.01		2069.8	18.7	2407.5	9.1
12DS33_76a	12.6856	0.01	0.0578	0.01		489.1	5.9	601.3	22.7
12DS33_78a	2.9975	0.01	0.2351	0.00		1855.8	22.2	3083.2	7.2
12DS33_82a	2.6313	0.01	0.1610	0.00		2076.5	21.1	2477.5	9.1

12DS33_87a4.3946		0.03	0.1959	0.01		1321.7	30.1	2839.5	16.7	
12DS33_96a12.94890.02			0.0992	0.02		479.5	10.0	1600.7	35.8	
12DS33_97a2.6763		0.02	0.1917	0.01		2046.6	38.1	2749.1	7.4	
12DS33_99a3.6841		0.02	0.1086	0.01		1548.1	30.9	1771.7	8.5	
12DS33_109a		3.7586	0.02	0.1568	0.01		1520.7	29.0	2421.4	9.1
12DS33_118a		13.6082	0.01	0.0634	0.01		457.1	5.3	722.3	31.3
12DS33_119a		12.8335	0.01	0.0592	0.01		483.7	5.5	572.3	24.2
12DS33_120a		13.2477	0.01	0.0580	0.01		469.1	4.3	553.4	18.3

sample name	**238U 206Pb**	**1 sigma % error**	**207Pb 206Pb**	**1 sigma % error**	**Th U**	**206/238 age**	**1 sigma abs err**	**207/206 age**	**1 sigma abs err**
QPC									
< 10 % discordant									
QPC_2a	5.8450	0.03	0.0743	0.01	0.35	1018.1	24.1	1049.3	25.2
QPC_4a	2.2521	0.03	0.1690	0.01	0.39	2368.7	50.6	2547.5	18.7
QPC_6a	4.4696	0.03	0.0851	0.01	0.37	1301.6	30.0	1317.2	25.1
QPC_7a	4.8823	0.03	0.0812	0.02	0.33	1201.2	29.5	1225.2	31.4
QPC_11a	3.5736	0.02	0.1007	0.02	0.21	1590.5	28.1	1637.8	35.3
QPC_12a	1.9583	0.01	0.1870	0.01	0.20	2659.4	28.6	2715.8	11.8
QPC_13a	2.1704	0.02	0.1682	0.01	13.29	2442.9	31.8	2540.0	14.1
QPC_15a	5.9112	0.01	0.0740	0.01	11.29	1007.5	11.9	1040.3	16.0
QPC_21a	5.5015	0.02	0.0735	0.02	5.29	1076.6	22.4	1026.8	41.6
QPC_23a	3.4060	0.01	0.1087	0.01	3.29	1659.5	20.0	1778.4	13.3
QPC_24a	9.5405	0.01	0.0613	0.01	2.29	642.6	9.2	651.0	29.3
QPC_24b	9.3518	0.02	0.0602	0.02	0.29	654.9	11.9	609.1	32.5
QPC_25a	5.0011	0.01	0.0798	0.01	1.29	1175.1	16.0	1191.1	22.0
QPC_26a	5.8618	0.02	0.0756	0.01	0.36	1015.4	18.4	1083.5	27.2
QPC_27a	2.2762	0.02	0.1686	0.01	0.36	2347.6	34.6	2543.6	13.9
QPC_29b	10.2955	0.02	0.0610	0.01		597.6	10.6	640.8	30.4
QPC_30a	3.3344	0.02	0.1097	0.01		1690.8	26.1	1794.7	16.4
QPC_31a	4.1140	0.02	0.0912	0.01		1402.7	25.8	1450.8	26.1

QPC_32a	4.6295	0.02	0.0868	0.01		1260.7	21.3	1356.3	20.7
QPC_33a	5.6317	0.02	0.0772	0.02		1053.7	22.2	1126.3	38.2
QPC_34a	2.1680	0.02	0.1687	0.01		2445.1	35.1	2544.6	13.8
QPC_37a	4.1832	0.02	0.0913	0.01		1381.8	23.2	1452.2	14.7
QPC_38a	4.1526	0.02	0.0939	0.01		1390.9	23.1	1505.4	14.3
QPC_40a	5.5047	0.02	0.0793	0.01		1076.0	18.2	1180.5	14.3
QPC_41a	3.4520	0.02	0.1042	0.01		1640.0	26.0	1700.3	11.9
QPC_44a	4.9987	0.02	0.0821	0.01		1175.6	20.0	1248.9	16.6
QPC_46a	5.4540	0.02	0.0780	0.01		1085.3	18.5	1147.6	14.2
QPC_47a	3.2899	0.02	0.1061	0.01		1710.9	32.1	1734.2	22.3
QPC_48a	2.3653	0.02	0.1692	0.01		2273.1	38.7	2549.4	11.5
QPC_49a	4.5941	0.02	0.0873	0.01		1269.6	21.4	1367.0	15.6
QPC_52a	2.1783	0.02	0.1688	0.00		2435.4	43.1	2545.8	8.1
QPC_53a	4.2262	0.02	0.0875	0.01		1369.1	27.1	1370.5	18.7
QPC_55a	5.0370	0.02	0.0808	0.01		1167.4	23.2	1215.8	12.3
QPC_58a	5.8923	0.02	0.0729	0.01		1010.5	21.2	1010.4	23.0
QPC_59a	4.3562	0.02	0.0886	0.01		1332.2	27.2	1396.3	17.3
QPC_64a	3.4920	0.02	0.1014	0.01		1623.4	31.4	1649.7	11.9
QPC_66a	4.1166	0.02	0.0897	0.02		1401.9	21.9	1419.7	33.5
QPC_70a	3.1502	0.02	0.1112	0.02		1777.2	25.9	1818.7	29.0
QPC_75a	5.2030	0.02	0.0771	0.02		1133.3	17.9	1123.1	35.6
QPC_76a	2.2068	0.02	0.1619	0.02		2409.3	32.7	2475.3	26.0
QPC_77a	4.6927	0.02	0.0799	0.02		1245.3	22.3	1195.5	38.5
QPC_78a	4.3428	0.02	0.0869	0.02		1335.9	20.3	1357.6	32.5
QPC_79a	3.1745	0.02	0.1140	0.02		1765.3	26.8	1864.4	30.1
QPC_81a	5.9738	0.02	0.0727	0.02		997.8	16.0	1005.4	36.1
QPC_82a	4.6294	0.02	0.0856	0.01	46.34	1260.8	19.4	1329.5	23.0
QPC_83a	5.7502	0.02	0.0742	0.01	45.34	1033.6	17.6	1047.3	25.0
QPC_84a	4.7780	0.02	0.0867	0.01	43.34	1225.0	17.2	1354.9	15.0
QPC_88a	2.2276	0.02	0.1701	0.01	39.34	2390.4	30.2	2558.6	12.1
QPC_89a	6.0005	0.02	0.0736	0.01	37.34	993.7	15.7	1031.2	22.5
QPC_90a	5.6618	0.02	0.0750	0.01	36.34	1048.5	15.0	1069.8	18.0

QPC_91a	4.3526	0.02	0.0882	0.01	34.34	1333.2	21.7	1386.8	11.2
QPC_92a	5.9385	0.02	0.0710	0.02	33.34	1003.3	22.8	956.6	34.8
QPC_95a	5.1748	0.02	0.0773	0.01	30.34	1138.9	19.4	1128.7	17.9
QPC_96a	5.2281	0.02	0.0796	0.01	29.34	1128.3	18.6	1187.8	15.1
QPC_97a	4.2350	0.02	0.0904	0.01	28.34	1366.5	22.6	1433.7	16.1
QPC_98a	4.1019	0.02	0.0913	0.01	27.34	1406.4	22.4	1452.3	12.7
QPC_101a	1.6971	0.02	0.2543	0.00	24.34	2986.4	40.9	3211.6	5.2
QPC_103a	4.3220	0.02	0.0901	0.01	22.34	1341.7	23.9	1428.5	17.7
QPC_108a	4.0713	0.01	0.0919	0.01	16.34	1415.9	18.1	1465.8	11.6
QPC_112a	5.5488	0.02	0.0771	0.01	12.34	1068.2	15.8	1123.5	18.2
QPC_114a	4.7490	0.02	0.0817	0.01	10.34	1231.9	19.3	1237.7	21.8
QPC_116a	4.1664	0.01	0.0881	0.01	8.34	1386.8	17.9	1384.1	15.4
QPC_117a	5.2052	0.02	0.0763	0.01	7.34	1132.8	17.9	1102.0	24.8
QPC_118a	5.5388	0.01	0.0767	0.01	6.34	1070.0	14.2	1112.1	14.1
QPC_120a	5.6171	0.01	0.0747	0.01	4.34	1056.2	14.3	1061.7	17.5
QPC_121a	4.5541	0.03	0.0881	0.01	56.29	1279.7	31.1	1384.5	24.2
QPC_122a	3.6024	0.03	0.1002	0.01	55.29	1579.2	37.8	1627.3	22.6
QPC_123a	2.2695	0.03	0.1704	0.01	54.29	2353.4	52.2	2561.6	19.9
QPC_124a	5.4208	0.03	0.0797	0.01	53.29	1091.4	27.1	1188.4	24.0
QPC_125a	3.9975	0.03	0.0905	0.01	52.29	1439.3	36.3	1437.0	24.8
QPC_126a	3.6136	0.03	0.1073	0.01	51.29	1574.9	38.5	1754.5	22.0
QPC_129a	3.9285	0.03	0.0929	0.02	48.29	1461.9	39.9	1486.5	28.4
QPC_130a	3.5597	0.03	0.1033	0.01	47.29	1596.0	42.5	1684.2	23.0
QPC_132a	5.4352	0.03	0.0775	0.01	45.29	1088.7	30.0	1133.1	28.1
QPC_133a	5.0284	0.03	0.0798	0.01	44.29	1169.2	31.0	1193.2	26.0
QPC_134a	4.3647	0.03	0.0845	0.01	43.29	1329.8	33.8	1304.1	26.0
QPC_135a	2.1780	0.03	0.1793	0.01	42.29	2435.7	59.6	2646.1	19.7
QPC_136a	5.3265	0.02	0.0778	0.01	40.29	1109.1	16.1	1142.5	14.6
QPC_139a	3.0425	0.01	0.1119	0.01	37.29	1832.0	22.8	1830.1	16.6
QPC_140a	3.3324	0.01	0.1081	0.01	36.29	1691.7	12.6	1767.9	9.2
QPC_141a	3.6410	0.01	0.1052	0.01	35.29	1564.4	14.3	1718.2	12.3
QPC_145b	5.6688	0.01	0.0743	0.01	29.29	1047.3	8.4	1049.8	13.7

QPC_148a	5.9410	0.01	0.0753	0.01	27.29	1002.9	11.0	1077.4	19.0
QPC_149a	3.7125	0.01	0.0997	0.01	26.29	1537.6	15.3	1619.4	11.4
QPC_155a	4.5347	0.03	0.0834	0.01	19.29	1284.6	29.1	1278.8	17.6
QPC_158a	4.4426	0.03	0.0869	0.01	16.29	1308.7	30.2	1357.5	16.2
> 10 % discordant									
QPC_9a	3.8040	0.03	0.1101	0.01	0.27	1504.6	34.0	1801.4	20.2
QPC_10a	2.3737	0.03	0.1710	0.01	0.23	2266.3	48.0	2567.3	18.5
QPC_18a	5.6489	0.01	0.1160	0.01	8.29	1050.7	13.3	1895.1	12.6
QPC_28a	2.4062	0.02	0.1705	0.01	0.39	2240.4	31.6	2562.1	13.1
QPC_35a	3.4689	0.02	0.1669	0.01		1632.9	25.4	2527.2	13.3
QPC_39a	4.1014	0.02	0.1025	0.01		1406.5	23.3	1669.7	12.9
QPC_43a	2.6079	0.02	0.2378	0.01		2092.4	37.1	3105.4	9.7
QPC_45a	5.5474	0.02	0.0860	0.02		1068.4	22.6	1337.5	28.9
QPC_51a	4.6748	0.02	0.0914	0.01		1249.6	25.9	1455.1	12.0
QPC_56a	5.4674	0.02	0.0832	0.01		1082.8	22.8	1273.6	15.7
QPC_63a	5.4155	0.02	0.0839	0.01		1092.4	22.3	1289.4	16.8
QPC_65a	2.2052	0.02	0.1863	0.01		2410.6	44.6	2709.7	9.4
QPC_68a	6.1451	0.02	0.0886	0.02		971.9	16.4	1396.4	31.7
QPC_69a	2.8615	0.02	0.1817	0.02		1932.0	30.3	2668.8	25.2
QPC_72a	5.2312	0.02	0.0910	0.02		1127.7	16.0	1447.2	29.2
QPC_86a	4.0432	0.02	0.1044	0.01	41.34	1424.7	21.0	1703.8	15.3
QPC_105a	7.4352	0.02	0.0700	0.01	20.34	813.5	14.6	927.4	18.8
QPC_106a	4.5350	0.02	0.1074	0.01	18.34	1284.6	21.6	1755.0	9.4
QPC_113a	4.7409	0.01	0.0894	0.01	11.34	1233.8	16.3	1413.7	16.5
QPC_119a	2.7154	0.02	0.1702	0.00	5.34	2021.3	26.8	2559.9	5.5
QPC_128a	4.9546	0.03	0.1075	0.01	49.29	1185.2	33.0	1757.7	23.4
QPC_142a	2.8800	0.01	0.1614	0.00	34.29	1921.3	15.9	2470.6	8.4
QPC_143a	2.4745	0.01	0.1602	0.01	33.29	2188.0	15.6	2457.3	9.1
QPC_147a	2.3696	0.01	0.1738	0.00	28.29	2269.6	21.3	2594.8	8.2
QPC_150a	3.8884	0.01	0.1042	0.01	25.29	1475.4	13.8	1699.5	12.8
QPC_152a	8.1865	0.03	0.0760	0.01	22.29	742.9	20.2	1096.0	20.3
QPC_159a	24.7671	0.02	0.0796	0.01	15.29	255.2	5.3	1188.0	15.1

APPENDIX 1E:

BSU zircon CA-IDTIMS U-Pb geochronology

	Compositional Parameters						Radiogenic Isotope Ratios									Isotopic Ages				
Sample	Th U	^{206}Pb* x10^{-13} mol	mol % ^{206}Pb*	Pb* Pbc	Pbc (pg)	$\frac{^{206}Pb}{^{204}Pb}$	$\frac{^{208}Pb}{^{206}Pb}$	$\frac{^{207}Pb}{^{206}Pb}$	% err	$\frac{^{207}Pb}{^{235}U}$	% err	$\frac{^{206}Pb}{^{238}U}$	% err	corr. coef.	$\frac{^{207}Pb}{^{206}Pb}$	±	$\frac{^{207}Pb}{^{235}U}$	±	$\frac{^{206}Pb}{^{238}U}$	±
(a)	(b)	(c)	(c)	(c)	(c)	(d)	(e)	(e)	(f)	(e)	(f)	(e)	(f)		(g)	(f)	(g)	(f)	(g)	(f)
10RL878																				
z1a	0.568	0.0684	95.33	6	0.28	384	0.176	0.059486	1.108	0.876886	1.208	0.106912	0.298	0.445	584.93	24.05	639.30	5.73	654.791	1.856
z1b	0.654	0.2791	99.06	33	0.22	1908	0.203	0.061342	0.176	0.907350	0.238	0.107280	0.094	0.773	651.23	3.77	655.65	1.15	656.931	0.586
z2a	0.735	0.5596	99.55	71	0.21	4033	0.228	0.061425	0.110	0.904406	0.168	0.106786	0.073	0.876	654.16	2.36	654.08	0.81	654.056	0.454
z2b	0.739	0.5523	99.17	38	0.39	2139	0.229	0.061354	0.135	0.900359	0.188	0.106432	0.074	0.814	651.67	2.89	651.92	0.90	651.992	0.458
10RL893																				
z1a	0.877	0.3488	98.91	30	0.32	1667	0.273	0.063990	0.187	0.876397	0.241	0.099331	0.086	0.733	741.31	3.96	639.03	1.14	610.489	0.499
z1b	1.058	1.1798	98.60	25	1.38	1319	0.329	0.064383	0.135	0.902199	0.188	0.101632	0.071	0.831	754.23	2.85	652.90	0.91	623.966	0.423
z2	0.570	1.7638	99.71	106	0.43	6273	0.179	0.063632	0.084	0.641033	0.140	0.073064	0.066	0.920	729.41	1.77	502.95	0.55	454.590	0.288

12DS33

z1	1.316	1.1849	99.74	139	0.26	6895	0.412	0.057129	0.094	0.620374	0.148	0.078758	0.066	0.897	496.52	2.06	490.08	0.58	488.704 0.310
z2	1.434	1.3345	99.77	163	0.25	7882	0.449	0.057123	0.083	0.596110	0.142	0.075686	0.067	0.933	496.29	1.84	474.76	0.54	470.320 0.302
z3	0.608	0.3069	96.51	9	0.92	524	0.190	0.057164	0.448	0.629380	0.509	0.079853	0.096	0.692	497.86	9.88	495.71	2.00	495.244 0.458
z4	1.191	1.4507	99.47	67	0.64	3432	0.374	0.057052	0.111	0.565528	0.164	0.071892	0.066	0.873	493.54	2.45	455.12	0.60	447.547 0.286
z5	0.490	6.2224	99.80	151	1.03	9161	0.153	0.057252	0.071	0.618732	0.130	0.078381	0.064	0.966	501.26	1.55	489.05	0.51	486.450 0.299
z6	2.876	2.6290	99.80	249	0.43	9221	0.901	0.057170	0.081	0.611079	0.137	0.077522	0.064	0.931	498.10	1.77	484.24	0.53	481.317 0.297
z7	0.515	0.9487	99.67	90	0.26	5406	0.161	0.057014	0.102	0.614953	0.157	0.078227	0.068	0.879	492.09	2.26	486.68	0.61	485.532 0.319
z8	2.245	5.2558	99.94	684	0.28	28147	0.703	0.057114	0.068	0.620198	0.127	0.078756	0.063	0.962	495.94	1.50	489.97	0.49	488.695 0.299
z9	1.390	0.9193	99.59	91	0.31	4425	0.436	0.057044	0.114	0.579266	0.166	0.073649	0.067	0.849	493.23	2.52	463.99	0.62	458.104 0.297

14DS12

z1	0.559	0.9445	99.58	73	0.33	4379	0.175	0.057012	0.123	0.586024	0.173	0.074550	0.070	0.806	491.99	2.72	468.33	0.65	463.513 0.314
z2	0.516	0.6139	99.37	48	0.32	2894	0.162	0.057044	0.123	0.594177	0.177	0.075545	0.071	0.842	493.23	2.72	473.53	0.67	469.477 0.324
z3	0.574	3.0791	99.72	110	0.72	6534	0.179	0.065629	0.084	0.861254	0.140	0.095178	0.068	0.904	794.56	1.76	630.81	0.66	586.087 0.381
z4	0.683	5.0819	99.88	257	0.52	14883	0.214	0.057192	0.066	0.608244	0.127	0.077134	0.065	0.972	498.93	1.45	482.45	0.49	478.992 0.298

z5	0.898	1.2187	99.55	75	0.45	4114	0.282	0.056820	0.121	0.568045	0.177	0.072507	0.079	0.821	484.54	2.66	456.75	0.65	451.244	0.346
z6	0.648	5.2507	99.88	262	0.52	15303	0.203	0.057212	0.066	0.609094	0.126	0.077214	0.063	0.979	499.72	1.44	482.99	0.48	479.470	0.292
z7	0.804	10.8239	99.94	577	0.51	32378	0.252	0.057252	0.062	0.618084	0.124	0.078299	0.064	0.984	501.26	1.36	488.65	0.48	485.960	0.298
14DS12																				
z1	0.559	0.9445	99.58	73	0.33	4359	0.175	0.056975	0.114	0.585638	0.166	0.074549	0.070	0.843	490.57	2.51	468.08	0.62	463.504	0.311
z2	0.516	0.6138	99.37	48	0.32	2892	0.162	0.057031	0.118	0.593910	0.173	0.075528	0.070	0.865	492.72	2.60	473.36	0.66	469.377	0.318
z3	0.574	3.0791	99.72	110	0.72	6534	0.179	0.065629	0.084	0.861254	0.140	0.095178	0.068	0.904	794.56	1.76	630.81	0.66	586.087	0.381
z4	0.683	5.0819	99.88	257	0.52	14883	0.214	0.057192	0.066	0.608244	0.127	0.077134	0.065	0.972	498.93	1.45	482.45	0.49	478.992	0.298
z5	0.898	1.2188	99.56	76	0.44	4174	0.282	0.056798	0.099	0.567745	0.165	0.072497	0.075	0.928	483.70	2.19	456.55	0.61	451.180	0.326
z6	0.648	5.2507	99.88	262	0.52	15303	0.203	0.057212	0.066	0.609094	0.126	0.077214	0.063	0.979	499.72	1.44	482.99	0.48	479.470	0.292
z7	0.804	10.8239	99.94	577	0.51	32378	0.252	0.057252	0.062	0.618084	0.124	0.078299	0.064	0.984	501.26	1.36	488.65	0.48	485.960	0.298
14RL011a																				
z1	0.314	8.5882	99.91	322	0.65	20060	0.094	0.089261	0.063	2.937240	0.125	0.238658	0.065	0.974	1409.77	1.21	1391.56	0.95	1379.716	0.806
z2a	0.421	3.1637	99.51	61	1.28	3794	0.131	0.061774	0.078	0.896521	0.143	0.105258	0.071	0.953	666.28	1.66	649.87	0.68	645.151	0.439
z2b	0.468	4.1123	99.93	419	0.24	25301	0.145	0.061668	0.067	0.868741	0.127	0.102172	0.064	0.962	662.60	1.44	634.88	0.60	627.125	0.384

z3a	0.469	23.5656	99.89	270	2.19	16391	0.141	0.078391	0.064	2.118894	0.142	0.196039	0.093	0.936	1156.79	1.28	1154.98	0.98	1154.009	0.978
z4	0.283	7.7709	99.94	490	0.38	30570	0.084	0.090356	0.061	3.007175	0.123	0.241378	0.065	0.983	1433.07	1.16	1409.44	0.94	1393.859	0.811
z5	0.480	3.2403	99.81	158	0.52	9514	0.147	0.076370	0.066	1.660058	0.128	0.157651	0.065	0.976	1104.80	1.32	993.40	0.81	943.709	0.570
z6	0.405	4.1163	99.82	168	0.60	10345	0.123	0.074007	0.079	1.775928	0.135	0.174040	0.067	0.909	1041.66	1.60	1036.69	0.88	1034.334	0.637
z7	0.410	7.6895	99.94	535	0.36	32610	0.126	0.075515	0.064	1.382215	0.124	0.132752	0.063	0.973	1082.24	1.29	881.38	0.73	803.547	0.480
z8a	0.472	2.3943	99.90	309	0.19	18592	0.147	0.061575	0.065	0.911462	0.126	0.107357	0.063	0.983	659.39	1.39	657.83	0.61	657.381	0.395
z8b	0.474	6.4790	99.94	546	0.30	33024	0.147	0.061697	0.063	0.906555	0.124	0.106568	0.064	0.980	663.64	1.35	655.22	0.60	652.784	0.396
z9a	0.298	3.4403	99.87	218	0.38	13857	0.092	0.061397	0.070	0.880349	0.130	0.103994	0.065	0.964	653.17	1.50	641.17	0.62	637.771	0.394
z9b	0.337	3.4714	99.87	232	0.36	14590	0.105	0.061531	0.066	0.871906	0.127	0.102772	0.063	0.977	657.84	1.41	636.60	0.60	630.636	0.381
z10	0.441	3.8426	99.75	120	0.79	7398	0.137	0.061856	0.069	0.871571	0.130	0.102193	0.064	0.976	669.13	1.48	636.42	0.61	627.248	0.380

BC14-02

z1a	0.422	0.1819	98.90	27	0.17	1645	0.131	0.062217	0.259	0.851595	0.321	0.099271	0.116	0.661	681.57	5.53	625.52	1.50	610.138	0.674
z1b	0.356	0.0292	84.68	2	0.44	120	0.110	0.060282	6.702	0.894400	6.841	0.107608	0.914	0.218	613.71	144.77	648.73	32.80	658.840	5.724

BC14-03

z1a	0.602	0.9679	99.51	64	0.39	3761	0.186	0.062548	0.091	0.975688	0.150	0.113135	0.069	0.917	692.90	1.93	691.39	0.75	690.926	0.453

z1b	0.552	0.1906	96.77	9	0.52	570	0.171	0.062293	0.344	0.945553	0.413	0.110090	0.136	0.635	684.18	7.33	675.78	2.04	673.268	0.868
z2a	0.933	0.2391	97.76	15	0.45	818	0.288	0.064687	0.246	1.114692	0.317	0.124979	0.132	0.686	764.17	5.18	760.43	1.70	759.158	0.948
z2b	1.223	0.1379	90.82	4	1.15	201	0.378	0.064226	0.710	1.069935	0.790	0.120822	0.212	0.491	749.08	15.01	738.71	4.15	735.293	1.473
z3	0.968	0.9214	99.38	55	0.47	2960	0.296	0.069590	0.092	1.463233	0.152	0.152498	0.071	0.914	916.29	1.89	915.34	0.92	914.951	0.602
z4	2.496	1.4345	99.63	123	0.44	4924	0.764	0.068995	0.078	1.422083	0.138	0.149488	0.067	0.945	898.59	1.61	898.24	0.82	898.091	0.559
QPC																				
z1a	0.508	2.0170	99.62	79	0.64	4783	0.158	0.061675	0.076	0.879186	0.136	0.103388	0.065	0.965	662.86	1.62	640.54	0.65	634.234	0.393
z1b	0.560	0.9841	99.30	44	0.57	2627	0.174	0.061630	0.123	0.851198	0.173	0.100171	0.070	0.818	661.28	2.63	625.31	0.81	615.408	0.413
z2a	0.468	2.2681	99.81	160	0.35	9694	0.147	0.061179	0.083	0.641996	0.142	0.076108	0.071	0.903	645.53	1.78	503.54	0.56	472.850	0.325
z2b	0.490	2.6740	99.54	67	1.01	4056	0.153	0.061481	0.075	0.702465	0.136	0.082868	0.065	0.969	656.09	1.61	540.26	0.57	513.218	0.319

(a) z1, z2 etc. are labels for single zircon grains or fragments annealed and chemically abraded after Mattinson (2005).

(b) Model Th/U ratio iteratively calculated from the radiogenic 208Pb/206Pb ratio and 206Pb/238U age.

(c) Pb* and Pbc represent radiogenic and common Pb, respectively; mol % 206Pb* with respect to radiogenic, blank and initial common Pb.

(d) Measured ratio corrected for spike and fractionation only. Fractionation estimated at 0.18 +/- 0.03 %/a.m.u. for Daly analyses, based on analysis of NBS-981 and NBS-982.

(e) Corrected for fractionation, spike, and common Pb; up to 1 pg of common Pb was assumed to be procedural blank: 206Pb/204Pb = 18.042 ± 0.61%; 207Pb/204Pb = 15.537 ± 0.52%; 208Pb/204Pb = 37.686 ± 0.63% (all uncertainties 1-sigma).

Excess over blank was assigned to initial common Pb, using the Stacey and Kramers (1975) two-stage Pb isotope evolution model at the nominal sample age.

(f) Errors are 2-sigma, propagated using the algorithms of Schmitz and Schoene (2007).

(g) Calculations are based on the decay constants of Jaffey et al. (1971). 206Pb/238U and 207Pb/206Pb ages corrected for initial disequilibrium in 230Th/238U using Th/U [magma] = 3.

APPENDIX 2A:

BSU zircon LA-ICPMS U-Pb geochronology

Composition									Corrected isotope ratios							Apparent ages (Ma)					
U Analysisnotes	Th ppm	Pb ppm	ppm	^{206}Pb Th/U	^{207}Pb ^{204}Pb	±2s ^{235}U	^{206}Pb (%)	±2s ^{238}U	error (%)	^{238}U corr.	±2s ^{206}Pb	^{207}Pb (%)	±2s ^{206}Pb	^{207}Pb (%)	±2s ^{206}Pb	^{207}Pb (abs)	±2s ^{235}U	^{206}Pb (abs)	±2s ^{238}U	% (abs)	disc.
67PL09																					
<20% discordant																					
67P_L09 S 42 7	1	98	104	14	1.06	256	0.874	5.2	0.1022	3.8	0.74	9.7841	3.81	0.0620	3.5	674	75	638	25	627	23
67P_L09 S 43 11	1	277	188	36	0.68	1354	0.833	5.0	0.0974	3.9	0.79	10.2624	3.93	0.0620	3.1	674	66	615	23	599	22
67P_L09 S 44 -9	1	139	61	17	0.44	319	0.837	6.1	0.1024	4.1	0.68	9.7632	4.15	0.0593	4.4	577	96	618	28	629	25
67P_L09 S 45 12	1	149	293	123	1.97	32248	10.031	5.3	0.4222	5.0	0.96	2.3685	5.04	0.1723	1.5	2580	25	2438	49	2270	96
67P_L09 S 52 6	1	125	40	34	0.32	4175	2.781	5.4	0.2266	4.8	0.90	4.4127	4.81	0.0890	2.4	1404	45	1350	40	1317	57
67P_L09 S 54 11	1	295	174	38	0.59	851	0.861	5.6	0.1001	4.7	0.84	9.9901	4.68	0.0624	3.1	688	65	631	26	615	27
67P_L09 S 55 16	1	459	519	65	1.13	30321	0.811	5.9	0.0942	4.9	0.83	10.6157	4.86	0.0625	3.3	690	70	603	27	580	27
67P_L09 S 56 1	1	277	163	35	0.59	1920	0.821	5.9	0.0989	4.9	0.84	10.1143	4.93	0.0602	3.1	611	68	608	27	608	29
67P_L09 S 57 7	1	95	107	14	1.13	150	0.833	6.2	0.0986	3.8	0.62	10.1404	3.83	0.0613	4.9	649	105	615	29	606	22
67P_L09 S 59 14	1	99	152	44	1.53	2253	3.991	5.1	0.2677	4.4	0.86	3.7353	4.41	0.1081	2.6	1768	47	1632	41	1529	60
67P_L09 S 61 5	1	130	112	18	0.86	2415	0.888	6.3	0.1040	4.6	0.73	9.6117	4.61	0.0619	4.3	671	91	645	30	638	28
67P_L09 S 62 2	1	131	84	17	0.64	626	0.886	6.0	0.1045	4.6	0.76	9.5669	4.60	0.0615	3.9	656	84	644	29	641	28

67P_L09 S 65	1	304	176	39	0.58	6199	0.880	6.6	0.1004	5.8	0.88	9.9642	5.78	0.0636	3.1	729	66	641	31	617	34	15
67P_L09 S 67	1	357	190	49	0.53	1108	0.911	6.1	0.1047	5.3	0.87	9.5501	5.27	0.0631	3.0	711	65	657	29	642	32	10
67P_L09 S 69	1	163	178	25	1.09	390	0.874	7.7	0.1062	6.0	0.78	9.4166	5.96	0.0597	4.8	591	105	638	36	651	37	-10
67P_L09 S 70	1	95	67	14	0.71	265	0.964	8.3	0.1095	5.3	0.64	9.1350	5.32	0.0639	6.4	738	135	686	41	670	34	9
67P_L09 S 74	1	265	118	180	0.44	24398	10.085	12.0	0.4330	11.6	0.97	2.3095	11.55	0.1689	3.1	2547	53	2443	111	2319	225	9
67P_L09 S 75	1	466	863	87	1.85	2352	0.886	9.0	0.1028	8.2	0.91	9.7236	8.17	0.0625	3.8	692	80	644	43	631	49	9
67P_L09 S 76	1	306	668	59	2.18	3612	0.825	7.4	0.1028	6.1	0.82	9.7312	6.10	0.0582	4.3	537	93	611	34	631	37	-17
67P_L09 S 77	1	114	100	16	0.87	661	0.903	9.0	0.1020	6.8	0.75	9.8046	6.79	0.0642	6.0	749	126	653	44	626	41	16
67P_L09 S 78	1	169	96	65	0.57	2106	4.070	11.9	0.2850	10.8	0.91	3.5083	10.80	0.1036	4.9	1689	91	1648	97	1617	154	4
67P_L09 S 79	1	171	137	70	0.80	2719	4.012	10.5	0.2851	9.6	0.92	3.5081	9.64	0.1021	4.2	1662	78	1637	86	1617	138	3
67P_L09 S 80	1	197	130	29	0.66	888	0.934	9.4	0.1120	8.3	0.89	8.9260	8.29	0.0605	4.3	620	94	670	46	685	54	-10
67P_L09 S 81	1	107	103	44	0.96	970	4.158	7.1	0.2744	5.8	0.81	3.6447	5.79	0.1099	4.2	1798	76	1666	59	1563	80	13
67P_L09 S 83	1	514	422	74	0.82	13978	0.893	10.0	0.1025	8.7	0.87	9.7526	8.71	0.0631	4.9	713	105	648	48	629	52	12
67P_L09 S 84	1	110	99	35	0.89	505	2.800	9.6	0.2196	8.8	0.92	4.5543	8.78	0.0925	3.8	1478	72	1356	72	1280	102	13
67P_L09 S 85	1	158	139	24	0.88	544	0.969	10.3	0.1097	8.9	0.87	9.1171	8.90	0.0641	5.2	745	109	688	51	671	57	10
67P_L09 S 86	1	65	61	9	0.94	137	0.889	10.9	0.1004	7.4	0.68	9.9627	7.38	0.0642	8.0	749	169	646	52	617	43	18

67P_L09 S 89	1	233	237	35	1.02	463	0.897	8.2	0.1025	6.2	0.75	9.7580	6.19	0.0635	5.4	723	115	650	39	629	37	13
67P_L09 S 90	1	301	304	243	1.01	21458	11.458	15.6	0.5155	15.2	0.97	1.9400	15.23	0.1612	3.5	2468	59	2561	146	2680	334	-9
67P_L09 S 91	1	247	102	31	0.41	3855	0.856	8.2	0.1006	7.1	0.87	9.9420	7.14	0.0618	4.1	666	87	628	38	618	42	7
67P_L09 S 93	1	11418	2739	8725	0.24	407	16.071	10.5	0.5522	8.6	0.82	1.8108	8.64	0.2111	5.9	2914	96	2881	100	2834	198	3
67P_L09 S 94	1	171	144	26	0.85	654	0.959	9.1	0.1123	7.7	0.84	8.9069	7.67	0.0619	4.9	672	106	683	45	686	50	-2
67P_L09 S 99	1	255	178	37	0.70	1065	0.938	7.3	0.1108	5.6	0.77	9.0234	5.63	0.0614	4.7	653	100	672	36	678	36	-4
67P_L09 S 101	1	129	65	51	0.50	3041	4.418	8.2	0.3138	7.1	0.87	3.1864	7.09	0.1021	4.1	1662	76	1716	68	1760	109	-6
67P_L09 S 103	1	372	281	51	0.76	692	0.871	10.7	0.1012	8.9	0.84	9.8840	8.95	0.0625	5.8	690	124	636	50	621	53	10
67P_L09 S 106	1	271	328	194	1.21	7370	9.467	5.6	0.4102	4.8	0.87	2.4376	4.83	0.1674	2.7	2531	46	2384	51	2216	91	12
67P_L09 S 109	1	63	55	10	0.88	1022	1.085	9.7	0.1194	6.1	0.63	8.3728	6.11	0.0659	7.5	802	158	746	51	727	42	9
67P_L09 S 110	1	224	84	84	0.38	1731	4.336	9.6	0.2922	9.0	0.94	3.4221	8.99	0.1076	3.3	1759	60	1700	79	1653	131	6
67P_L09 S 113	1	236	175	86	0.74	84506	3.676	5.1	0.2575	4.9	0.95	3.8837	4.89	0.1036	1.6	1689	29	1566	41	1477	65	13
67P_L09 S 114	1	165	136	23	0.82	1238	0.922	5.4	0.1091	4.9	0.89	9.1639	4.86	0.0613	2.5	648	53	663	27	668	31	-3
67P_L09 S 115	1	99	138	15	1.40	763	0.957	8.2	0.1084	5.6	0.68	9.2287	5.58	0.0641	6.1	744	128	682	41	663	35	11
67P_L09 L 235	2	45	43	7	0.95	241	0.898	9.4	0.1083	6.6	0.71	9.2305	6.62	0.0601	6.7	609	144	651	45	663	42	-9
67P_L09 L 237	2	58	42	9	0.73	1398	1.082	11.4	0.1160	8.0	0.71	8.6206	8.04	0.0677	8.1	858	167	745	60	708	54	18

67P_L09 L 239 2 15	143	659	41	4.59	956	0.844	6.6	0.0974	5.0	0.76	10.2631	5.01	0.0629	4.3	703	91	622	31	599	29
67P_L09 L 241 2 0	246	236	37	0.96	887	0.882	10.5	0.1047	8.9	0.85	9.5531	8.87	0.0611	5.6	643	120	642	50	642	54
67P_L09 L 242 2 16	156	83	91	0.53	4528	8.774	8.0	0.3856	7.3	0.91	2.5935	7.27	0.1650	3.3	2508	56	2315	73	2102	130
67P_L09 L 245 2 7	60	88	10	1.47	112098	0.994	10.2	0.1126	8.3	0.82	8.8773	8.31	0.0640	5.9	742	124	701	51	688	54
67P_L09 L 247 2 -13	106	77	16	0.72	1128	0.956	11.2	0.1147	9.5	0.85	8.7170	9.53	0.0604	5.8	618	126	681	55	700	63
67P_L09 L 249 2 7	258	203	35	0.79	1398	0.865	5.5	0.1013	4.4	0.80	9.8690	4.41	0.0619	3.3	671	71	633	26	622	26
67P_L09 L 252 2 7	144	144	22	1.00	823	0.968	5.5	0.1106	4.6	0.84	9.0407	4.58	0.0634	3.0	723	63	687	27	676	29
67P_L09 L 255 2 14	180	155	25	0.86	11345	0.942	5.7	0.1060	4.8	0.85	9.4333	4.83	0.0644	2.9	755	62	674	28	650	30
67P_L09 L 256 2 5	64	79	10	1.24	781	0.967	7.5	0.1111	5.5	0.73	9.0027	5.50	0.0631	5.1	712	108	687	37	679	35
67P_L09 L 257 2 4	84	88	12	1.06	482	0.977	5.9	0.1122	4.0	0.69	8.9114	4.04	0.0632	4.3	713	91	692	30	686	26
67P_L09 L 258 2 13	60	54	8	0.90	170	0.956	8.5	0.1075	5.7	0.68	9.2984	5.74	0.0644	6.2	756	131	681	42	658	36
67P_L09 L 259 2 3	244	198	35	0.81	1136	0.984	7.7	0.1132	6.9	0.90	8.8364	6.91	0.0631	3.4	710	73	696	39	691	45
67P_L09 L 260 2 9	265	54	33	0.20	1343	0.976	6.3	0.1106	5.8	0.91	9.0453	5.77	0.0640	2.6	742	56	691	32	676	37
67P_L09 L 261 2 6	276	394	43	1.43	3056	0.893	6.7	0.1041	5.6	0.84	9.6058	5.61	0.0622	3.6	682	76	648	32	638	34
67P_L09 L 262 2 14	504	698	77	1.38	1617	0.864	8.3	0.0995	7.8	0.95	10.0495	7.82	0.0630	2.7	708	57	632	39	612	46
67P_L09 L 263 2 8	225	347	36	1.55	1265	0.931	10.0	0.1069	9.2	0.92	9.3536	9.15	0.0631	4.0	713	85	668	49	655	57

67P_L09 L 264	2	111	54	39	0.49	1601	4.244	5.9	0.2769	5.1	0.87	3.6109	5.09	0.1111	2.9	1818	53	1683	48	1576	71	13
67P_L09 L 265	2	58	59	8	1.02	18618	0.933	7.9	0.1104	5.6	0.71	9.0583	5.57	0.0613	5.6	649	119	669	39	675	36	-4
67P_L09 L 266	2	117	118	17	1.01	662	0.972	6.5	0.1098	5.6	0.86	9.1103	5.57	0.0642	3.3	750	69	690	32	671	36	10
67P_L09 Bulk 189	3	213	108	125	0.51	7648	9.044	9.3	0.3853	8.7	0.93	2.5956	8.65	0.1703	3.4	2560	56	2342	85	2101	155	18
67P_L09 Bulk 195	3	123	114	58	0.92	1395	5.260	10.8	0.3327	9.8	0.90	3.0055	9.75	0.1146	4.6	1874	83	1862	92	1852	157	1
67P_L09 Bulk 199	3	87	31	31	0.36	1018	4.427	7.1	0.2890	6.2	0.87	3.4599	6.24	0.1111	3.5	1817	63	1717	59	1637	90	10
67P_L09 Bulk 200	3	195	73	74	0.38	29018	4.316	10.1	0.2945	9.0	0.89	3.3955	8.99	0.1063	4.5	1737	83	1696	83	1664	132	4
67P_L09 Bulk 204	3	277	195	181	0.70	7535	9.183	11.6	0.3899	10.9	0.94	2.5649	10.90	0.1708	3.8	2566	64	2356	106	2122	197	17
67P_L09 Bulk 206	3	303	229	44	0.75	1989	0.924	8.6	0.1095	7.2	0.83	9.1316	7.17	0.0612	4.7	646	102	664	42	670	46	-4
67P_L09 Bulk 207	3	151	101	103	0.67	3918	10.493	6.4	0.4425	5.7	0.89	2.2597	5.70	0.1720	2.9	2577	49	2479	59	2362	113	8
67P_L09 Bulk 211	3	457	279	67	0.61	1725	0.970	7.6	0.1118	6.2	0.82	8.9410	6.20	0.0629	4.4	704	93	688	38	683	40	3
67P_L09 Bulk 222	3	188	109	68	0.58	7380	3.995	7.5	0.2710	5.9	0.80	3.6902	5.93	0.1069	4.5	1748	83	1633	61	1546	82	12
67P_L09 Bulk 227	3	161	158	114	0.99	500	10.728	7.4	0.4268	6.5	0.87	2.3428	6.45	0.1823	3.6	2674	59	2500	69	2291	124	14
67P_L09 Bulk 229	3	65	59	10	0.92	350	0.955	12.8	0.1153	7.0	0.54	8.6749	6.95	0.0601	10.7	607	232	681	63	703	46	-16
67P_L09 Bulk 233	3	232	322	172	1.39	1697	9.322	6.5	0.3877	6.1	0.94	2.5793	6.13	0.1744	2.2	2600	37	2370	60	2112	110	19
67P_L09 Bulk 234	3	88	67	62	0.76	2139	11.593	5.5	0.4854	4.7	0.86	2.0602	4.70	0.1732	2.8	2589	47	2572	51	2551	99	1

67P_L09 Bulk 236	3	241	184	34	0.76	3721	0.903	10.1	0.1070	7.6	0.76	9.3467	7.62	0.0612	6.6	646	142	653	49	655	48	-1
67P_L09 Bulk 240	3	123	82	74	0.67	2261	9.626	6.2	0.4249	5.8	0.94	2.3532	5.82	0.1643	2.1	2500	36	2400	57	2283	112	9
67P_L09 Bulk 241	3	224	277	84	1.23	3225	3.333	11.0	0.2404	10.6	0.96	4.1598	10.58	0.1006	3.2	1634	59	1489	86	1389	132	15
67P_L09 Bulk 243	3	270	90	79	0.33	1522	3.009	7.9	0.2277	7.1	0.89	4.3915	7.08	0.0958	3.6	1544	68	1410	61	1323	85	14
67P_L09 Bulk 246	3	89	78	13	0.87	771	0.965	10.5	0.1119	6.4	0.61	8.9388	6.37	0.0625	8.3	693	177	686	52	684	41	1
67P_L09 Bulk 247	3	118	106	17	0.90	149	0.962	10.6	0.1107	7.1	0.67	9.0314	7.09	0.0630	7.9	708	169	684	53	677	46	4
67P_L09 Bulk 249	3	38	37	6	0.97	58	0.986	14.2	0.1140	8.2	0.58	8.7734	8.20	0.0627	11.6	700	246	697	71	696	54	1
67P_L09 Bulk 254	3	172	215	29	1.25	482	0.987	8.9	0.1128	4.8	0.54	8.8630	4.78	0.0635	7.5	724	158	697	45	689	31	5
67P_L09 Bulk 256	3	28	11	4	0.39	273	0.956	16.6	0.1149	7.5	0.46	8.7051	7.54	0.0604	14.7	617	318	681	82	701	50	-14
67P_L09 Bulk 260	3	67	63	53	0.95	242	14.238	9.0	0.4610	6.3	0.70	2.1690	6.30	0.2240	6.4	3009	103	2766	85	2444	128	19
67P_L09 Bulk 266	3	125	48	76	0.38	3998	10.172	7.6	0.4541	7.1	0.94	2.2020	7.10	0.1625	2.6	2481	44	2451	70	2414	143	3
67P_L09 Bulk 267	3	371	350	58	0.94	3115	0.880	7.4	0.1077	6.6	0.88	9.2855	6.58	0.0592	3.5	576	75	641	35	659	41	-14
67P_L09 Bulk 270	3	444	385	62	0.87	313	0.842	9.1	0.0965	7.4	0.82	10.3585	7.42	0.0633	5.2	717	111	620	42	594	42	17
67P_L09 Bulk 273	3	245	352	188	1.44	2503	9.159	9.5	0.3805	9.0	0.95	2.6279	9.01	0.1746	3.0	2602	51	2354	87	2079	160	20
67P_L09 Bulk 275	3	135	121	99	0.89	2101	10.935	6.5	0.4660	5.8	0.90	2.1459	5.81	0.1702	2.9	2559	48	2518	60	2466	119	4
67P_L09 Bulk 280	3	68	51	9	0.75	318	1.012	9.7	0.1119	6.5	0.67	8.9377	6.46	0.0656	7.2	794	152	710	50	684	42	14

67P_L09 Bulk 284	4	159	64	58	0.40	1911	4.113	8.0	0.2795	7.5	0.93	3.5773	7.47	0.1067	2.8	1744	52	1657	65	1589	105	9
67P_L09 Bulk 286	4	589	1101	113	1.87	1653	0.867	9.1	0.1014	8.7	0.95	9.8607	8.67	0.0620	2.7	675	58	634	43	623	51	8
>20% discordant																						
67P_L09 S 40	1	1020	1477	156	1.45	3497	0.791	6.4	0.0843	4.5	0.70	11.8620	4.51	0.0680	4.6	870	94	592	29	522	23	40
67P_L09 S 41	1	1049	1434	161	1.37	10731	0.728	5.5	0.0850	5.1	0.93	11.7714	5.10	0.0621	2.0	678	42	555	23	526	26	23
67P_L09 S 50	1	259	144	30	0.56	368	0.803	7.8	0.0908	6.3	0.81	11.0128	6.28	0.0641	4.6	746	96	598	35	560	34	25
67P_L09 S 51	1	190	127	24	0.67	1195	0.894	5.9	0.0996	5.0	0.85	10.0432	4.97	0.0651	3.1	778	65	649	28	612	29	21
67P_L09 S 53	1	448	133	139	0.30	29768	3.209	5.8	0.2167	5.3	0.92	4.6157	5.29	0.1074	2.3	1756	42	1459	45	1264	61	28
67P_L09 S 63	1	774	631	625	0.82	4071	8.105	12.5	0.2303	12.3	0.99	4.3424	12.31	0.2552	1.9	3218	31	2243	113	1336	149	58
67P_L09 S 64	1	410	163	234	0.40	34387	7.323	6.1	0.3263	5.9	0.95	3.0648	5.85	0.1628	1.9	2485	31	2152	55	1820	93	27
67P_L09 S 72	1	374	150	45	0.40	999	0.868	6.3	0.0964	4.9	0.77	10.3726	4.86	0.0653	4.0	785	84	635	30	593	28	24
67P_L09 S 73	1	371	565	298	1.52	11315	8.558	10.2	0.3656	9.7	0.95	2.7349	9.69	0.1698	3.3	2555	56	2292	93	2009	167	21
67P_L09 S 87	1	588	544	88	0.93	4515	0.943	14.0	0.0993	12.3	0.88	10.0698	12.28	0.0689	6.7	895	139	675	69	610	72	32
67P_L09 S 98	1	581	175	10	0.30	300	0.106	9.6	0.0151	7.5	0.78	66.2304	7.47	0.0508	6.1	231	140	102	9	97	7	58
67P_L09 S 100	1	764	705	329	0.92	11673	5.014	22.5	0.2294	22.2	0.99	4.3596	22.21	0.1585	3.4	2440	57	1822	190	1331	267	45
67P_L09 S 102	1	836	474	478	0.57	13221	5.703	14.8	0.2390	14.1	0.96	4.1833	14.09	0.1730	4.4	2587	73	1932	127	1382	175	47

67P_L09 S 108	1	66	58	11	0.89	1833	0.998	12.5	0.1264	8.3	0.67	7.9098	8.34	0.0572	9.3	501	205	703	63	767	60	-53
67P_L09 L 234	2	442	310	57	0.70	2834	0.799	7.0	0.0908	6.1	0.87	11.0188	6.09	0.0639	3.4	737	72	596	31	560	33	24
67P_L09 L 240	2	105	544	34	5.16	242	1.031	11.0	0.1078	9.1	0.83	9.2754	9.07	0.0694	6.2	909	128	719	57	660	57	27
67P_L09 L 251	2	250	329	35	1.32	669	0.943	5.5	0.1011	4.0	0.73	9.8900	4.01	0.0677	3.8	858	78	675	27	621	24	28
67P_L09 Bulk 190	3	687	885	144	1.29	264	1.626	21.1	0.1040	9.6	0.45	9.6186	9.55	0.1134	18.9	1855	341	980	133	638	58	66
67P_L09 Bulk 193	3	279	47	110	0.17	582	4.730	9.8	0.2694	7.2	0.73	3.7117	7.19	0.1273	6.7	2061	118	1772	82	1538	98	25
67P_L09 Bulk 196	3	451	142	169	0.32	383	4.356	11.0	0.2311	10.4	0.95	4.3279	10.42	0.1367	3.6	2186	62	1704	91	1340	126	39
67P_L09 Bulk 198	3	455	149	108	0.33	776	2.825	12.1	0.1632	11.4	0.95	6.1292	11.44	0.1256	3.9	2037	68	1362	91	974	103	52
67P_L09 Bulk 201	3	607	404	305	0.67	22053	5.997	12.4	0.2492	11.7	0.95	4.0121	11.71	0.1745	4.0	2601	66	1975	108	1435	151	45
67P_L09 Bulk 202	3	206	142	29	0.69	777	1.030	9.5	0.1066	7.8	0.82	9.3850	7.84	0.0701	5.4	932	112	719	49	653	49	30
67P_L09 Bulk 209	3	987	731	462	0.74	2342	5.298	29.4	0.2371	29.1	0.99	4.2183	29.08	0.1621	4.4	2478	74	1869	251	1371	359	45
67P_L09 Bulk 212	3	710	558	380	0.79	22878	4.883	9.6	0.2163	9.0	0.93	4.6233	8.99	0.1637	3.4	2495	58	1799	81	1262	103	49
67P_L09 Bulk 213	3	1167	624	401	0.53	2958	2.721	13.2	0.1238	13.0	0.98	8.0803	13.00	0.1595	2.6	2450	43	1334	98	752	92	69
67P_L09 Bulk 215	3	299	129	102	0.43	#DIV/0!	3.611	7.2	0.2426	6.3	0.88	4.1227	6.29	0.1080	3.5	1765	63	1552	57	1400	79	21
67P_L09 Bulk 217	3	441	619	97	1.40	239	1.877	21.0	0.1180	9.4	0.45	8.4763	9.35	0.1154	18.8	1886	338	1073	139	719	64	62
67P_L09 Bulk 225	3	293	383	234	1.31	12490	9.498	9.6	0.3829	9.1	0.95	2.6117	9.13	0.1799	3.0	2652	50	2387	88	2090	163	21

67P_L09 Bulk 230	3	558	634	411	1.14	293	7.893	13.1	0.2663	12.1	0.92	3.7547	12.08	0.2149	5.1	2943	82	2219	118	1522	164	48
67P_L09 Bulk 235	3	616	818	296	1.33	44	3.357	43.9	0.1601	23.8	0.54	6.2479	23.77	0.1521	36.9	2370	629	1494	343	957	211	60
67P_L09 Bulk 237	3	804	180	574	0.22	29796	5.637	20.9	0.1524	20.1	0.96	6.5613	20.07	0.2683	5.8	3296	91	1922	180	914	171	72
67P_L09 Bulk 238	3	1417	1784	525	1.26	373	2.493	19.7	0.1008	18.7	0.95	9.9247	18.72	0.1795	6.2	2648	103	1270	143	619	110	77
67P_L09 Bulk 242	3	878	1707	454	1.94	1243	4.222	22.9	0.1835	22.5	0.99	5.4496	22.53	0.1669	3.9	2526	65	1678	188	1086	225	57
67P_L09 Bulk 252	3	429	162	399	0.38	78	13.123	18.2	0.3445	8.3	0.45	2.9030	8.28	0.2763	16.2	3342	254	2689	172	1908	137	43
67P_L09 Bulk 253	3	84	65	14	0.77	448	1.466	12.9	0.1221	6.7	0.52	8.1918	6.69	0.0871	11.0	1363	213	917	78	742	47	46
67P_L09 Bulk 255	3	78	46	35	0.58	378	5.716	17.0	0.2962	6.3	0.37	3.3760	6.31	0.1400	15.8	2227	273	1934	147	1672	93	25
67P_L09 Bulk 259	3	681	506	348	0.74	4594	5.639	22.0	0.2456	21.8	0.99	4.0712	21.77	0.1665	3.3	2523	56	1922	190	1416	277	44
67P_L09 Bulk 262	3	269	170	51	0.63	3834	1.566	22.1	0.1227	9.7	0.44	8.1499	9.65	0.0926	19.9	1479	377	957	137	746	68	50
67P_L09 Bulk 263	3	457	395	299	0.86	9627	6.827	9.4	0.2951	9.2	0.98	3.3886	9.19	0.1678	1.8	2536	31	2089	83	1667	135	34
67P_L09 Bulk 265	3	396	309	100	0.78	382	2.666	10.6	0.1606	9.8	0.93	6.2276	9.81	0.1204	4.0	1962	71	1319	78	960	88	51
67P_L09 Bulk 268	3	800	102	315	0.13	8487	4.230	13.8	0.1825	13.5	0.98	5.4782	13.47	0.1681	2.8	2538	48	1680	113	1081	134	57
67P_L09 Bulk 269	3	538	232	307	0.43	6975	5.653	12.1	0.2537	11.3	0.94	3.9410	11.33	0.1616	4.2	2472	70	1924	104	1458	148	41
67P_L09 Bulk 272	3	267	588	223	2.20	23537	8.490	8.2	0.3602	7.5	0.92	2.7759	7.47	0.1709	3.3	2567	55	2285	74	1983	127	23
67P_L09 Bulk 274	3	226	117	179	0.52	151	12.480	11.6	0.3969	6.1	0.53	2.5196	6.11	0.2280	9.9	3038	158	2641	109	2155	112	29

67P_L09 Bulk 278	3	175	125	28	0.72	205	1.329	11.4	0.1222	8.9	0.78	8.1836	8.92	0.0789	7.1	1170	141	859	66	743	63	36
67P_L09 Bulk 279	3	460	392	288	0.85	4264	6.890	9.4	0.2864	9.1	0.96	3.4921	9.05	0.1745	2.7	2601	45	2097	84	1623	130	38

Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{235}U$	±2s (%)	$^{206}Pb/^{238}U$	±2s (%)	error corr.	$^{238}U/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$ (abs)	±2s	$^{207}Pb/^{235}U$ (abs)	±2s	$^{206}Pb/^{238}U$ (abs)	±2s	% disc.
69PL09																						
<20% discordant																						
69P_L09 S 41	1	224	262	41	1.17	654	1.146	8.1	0.1259	6.9	0.85	7.9419	6.93	0.0660	4.3	807	90	776	44	765	50	5
69P_L09 S 42	1	272	363	44	1.33	4995	0.981	7.0	0.1122	6.4	0.91	8.9146	6.36	0.0634	2.9	722	61	694	35	685	41	5
69P_L09 S 46	1	42	25	7	0.59	379	1.087	12.1	0.1206	10.6	0.88	8.2946	10.65	0.0654	5.6	786	119	747	64	734	74	7
69P_L09 M 50	2	53	31	7	0.59	97	0.993	8.5	0.1131	6.3	0.73	8.8386	6.26	0.0637	5.8	730	122	700	43	691	41	5
69P_L09 M 51	2	21	13	3	0.63	1068	0.985	11.4	0.1166	6.7	0.58	8.5758	6.66	0.0612	9.3	648	200	696	58	711	45	-10
69P_L09 M 53	2	305	719	62	2.36	484	0.861	9.8	0.1021	8.2	0.84	9.7935	8.24	0.0612	5.2	645	113	631	46	627	49	3
69P_L09 M 55	2	37	37	6	0.99	73	0.882	10.9	0.1078	5.7	0.52	9.2795	5.66	0.0593	9.4	579	203	642	52	660	35	-14
69P_L09 M 56	2	137	80	19	0.58	3321	0.989	5.3	0.1116	4.0	0.75	8.9638	3.97	0.0643	3.5	752	75	698	27	682	26	9
69P_L09 M 58	2	144	160	24	1.11	968	1.018	7.6	0.1161	5.4	0.71	8.6107	5.42	0.0636	5.3	727	113	713	39	708	36	3
69P_L09 M 60	2	49	38	7	0.78	193	0.953	9.7	0.1105	7.0	0.72	9.0507	7.01	0.0626	6.7	693	144	680	48	676	45	3

69P_L09 M 61	2	226	198	35	0.88	2969	1.020	5.8	0.1150	4.7	0.82	8.6931	4.74	0.0643	3.3	752	70	714	30	702	32	7
69P_L09 M 62	2	45	29	7	0.66	153	1.021	9.3	0.1217	5.2	0.57	8.2151	5.24	0.0608	7.6	633	164	714	47	740	37	-17
69P_L09 M 63	2	162	71	59	0.44	7587	4.030	6.0	0.2878	5.5	0.92	3.4743	5.54	0.1016	2.4	1653	45	1640	49	1631	80	1
69P_L09 M 64	2	207	200	77	0.97	2250	3.485	4.2	0.2577	3.7	0.87	3.8805	3.66	0.0981	2.1	1588	38	1524	33	1478	48	7
69P_L09 M 65	2	67	29	16	0.43	453	2.180	15.9	0.1903	15.0	0.94	5.2558	14.99	0.0831	5.4	1272	105	1175	111	1123	154	12
69P_L09 M 66	2	119	70	20	0.59	654	1.189	8.1	0.1347	6.6	0.81	7.4247	6.56	0.0641	4.8	743	101	796	45	815	50	-10
69P_L09 M 67	2	208	155	32	0.75	833	1.027	6.3	0.1185	4.7	0.75	8.4402	4.68	0.0629	4.2	703	89	717	32	722	32	-3
69P_L09 M 68	2	50	29	7	0.58	230	1.094	10.1	0.1170	6.3	0.63	8.5457	6.34	0.0678	7.9	862	164	750	54	713	43	17
69P_L09 M 69	2	129	98	18	0.76	535	0.971	5.8	0.1073	4.2	0.72	9.3209	4.22	0.0656	4.0	795	85	689	29	657	26	17
69P_L09 M 70	2	188	108	55	0.57	2077	2.930	44.5	0.2330	41.6	0.94	4.2915	41.62	0.0912	15.7	1451	298	1390	337	1350	507	7
69P_L09 M 71	2	32	18	4	0.57	744	0.910	12.5	0.1112	5.5	0.44	8.9964	5.49	0.0594	11.2	581	243	657	60	679	35	-17
69P_L09 M 75	2	468	326	140	0.70	15271	2.804	5.6	0.2144	5.0	0.90	4.6645	5.05	0.0949	2.4	1525	45	1357	42	1252	57	18
69P_L09 M 77	2	178	97	27	0.54	2245	1.033	5.6	0.1196	3.5	0.62	8.3602	3.46	0.0626	4.4	695	94	720	29	728	24	-5
69P_L09 M 79	2	485	254	66	0.52	5937	0.932	6.8	0.1059	5.2	0.76	9.4451	5.19	0.0638	4.4	737	93	669	33	649	32	12
69P_L09 M 80	2	76	24	20	0.32	904	2.630	9.7	0.2155	8.8	0.90	4.6403	8.81	0.0885	4.2	1393	80	1309	72	1258	101	10
69P_L09 M 81	2	177	131	31	0.74	257	1.261	9.5	0.1401	8.1	0.85	7.1391	8.06	0.0653	5.0	784	105	828	54	845	64	-8

69P_L09 M 86	2	51	28	7	0.55	724	1.061	8.7	0.1137	5.5	0.63	8.7912	5.50	0.0677	6.8	858	140	734	46	694	36	19
69P_L09 M 87	2	206	111	29	0.54	2743	0.955	7.1	0.1095	4.7	0.66	9.1306	4.65	0.0633	5.4	717	114	681	35	670	30	7
69P_L09 M 88	2	279	234	42	0.84	3395	1.000	6.1	0.1098	5.2	0.85	9.1089	5.20	0.0661	3.2	809	68	704	31	671	33	17
69P_L09 M 90	2	349	247	51	0.71	3107	0.944	7.4	0.1097	6.5	0.88	9.1192	6.53	0.0624	3.6	689	76	675	37	671	42	3
69P_L09 M 91	2	55	44	8	0.81	169	0.895	12.6	0.1096	8.1	0.64	9.1251	8.08	0.0592	9.6	575	209	649	60	670	51	-17
69P_L09 M 92	2	63	34	8	0.54	753	0.926	9.6	0.1049	6.1	0.63	9.5329	6.07	0.0640	7.4	743	157	666	47	643	37	13
69P_L09 M 93	2	135	50	16	0.37	383	0.903	8.6	0.1022	6.9	0.79	9.7837	6.85	0.0640	5.2	743	111	653	42	627	41	16
69P_L09 M 94	2	241	59	31	0.25	520	0.962	8.5	0.1130	7.8	0.92	8.8515	7.80	0.0618	3.4	666	72	684	42	690	51	-4
69P_L09 M 96	2	51	41	8	0.80	1294	1.054	8.9	0.1136	6.4	0.72	8.8019	6.44	0.0673	6.1	847	128	731	46	694	42	18
69P_L09 M 97	2	24	15	3	0.64	49	0.913	11.5	0.1118	7.9	0.69	8.9453	7.88	0.0592	8.4	575	182	658	56	683	51	-19
69P_L09 M 99	2	124	63	16	0.51	5076	0.917	10.6	0.1070	8.5	0.80	9.3439	8.52	0.0621	6.4	679	136	661	52	655	53	3
69P_L09 M 101	2	107	116	40	1.09	1488	3.476	8.2	0.2672	6.5	0.79	3.7419	6.46	0.0943	5.0	1515	95	1522	65	1527	88	-1
69P_L09 M 102	2	47	36	7	0.76	326	0.954	9.2	0.1073	5.2	0.56	9.3210	5.18	0.0645	7.6	757	161	680	46	657	32	13
69P_L09 M 103	2	162	95	22	0.58	3392	0.933	9.9	0.1084	7.6	0.77	9.2247	7.63	0.0624	6.2	687	133	669	48	663	48	3
69P_L09 M 104	2	151	101	22	0.67	435	1.015	10.8	0.1158	9.5	0.88	8.6338	9.50	0.0636	5.2	727	110	711	55	706	64	3
69P_L09 M 105	2	32	21	5	0.66	230	0.973	14.1	0.1175	8.1	0.58	8.5074	8.10	0.0600	11.5	605	249	690	70	716	55	-18

69P_L09 M 1062 2	31	16	5	0.53	157	1.053	11.7	0.1193	6.3	0.53	8.3834	6.26	0.0640	9.9	743	210	730	61	726	43
69P_L09 L 107 2 4	316	265	45	0.84	7434	0.913	6.0	0.1065	5.3	0.88	9.3861	5.26	0.0621	2.9	679	61	659	29	653	33
69P_L09 L 109 2 15	713	772	106	1.08	1841	0.891	6.6	0.1014	5.9	0.89	9.8641	5.88	0.0637	3.0	733	64	647	32	622	35
69P_L09 L 110 2 12	300	304	45	1.01	633	0.950	5.2	0.1073	4.2	0.81	9.3157	4.22	0.0642	3.0	748	64	678	26	657	26
69P_L09 L 111 2 14	36	20	5	0.56	328	1.011	9.7	0.1117	5.6	0.58	8.9519	5.60	0.0656	7.9	794	166	709	50	683	36
69P_L09 L 112 2 10	59	33	8	0.56	253	0.948	7.9	0.1077	4.9	0.62	9.2849	4.85	0.0638	6.2	736	131	677	39	659	30
69P_L09 L 114 2 -13	41	43	6	1.04	388	0.901	8.0	0.1094	4.7	0.58	9.1381	4.65	0.0597	6.5	593	140	652	38	669	30
69P_L09 L 116 2 4	230	169	35	0.74	887	1.015	5.4	0.1154	4.3	0.80	8.6635	4.33	0.0638	3.3	735	69	712	28	704	29
69P_L09 L 118 2 13	144	89	20	0.61	2053	0.974	7.0	0.1089	4.8	0.69	9.1831	4.84	0.0649	5.1	770	107	691	35	666	31
69P_L09 L 120 2 10	31	27	5	0.86	252	1.053	10.2	0.1168	6.2	0.61	8.5637	6.21	0.0654	8.1	788	171	731	53	712	42
69P_L09 L 121 2 -4	154	211	30	1.37	400	1.149	8.3	0.1293	6.8	0.82	7.7317	6.85	0.0644	4.7	756	99	777	45	784	51
69P_L09 L 123 2 10	293	201	45	0.69	1007	1.059	5.3	0.1172	4.3	0.81	8.5330	4.33	0.0656	3.1	793	66	734	28	714	29
69P_L09 L 126 2 18	55	41	8	0.74	2939	1.044	8.0	0.1130	5.0	0.63	8.8497	5.02	0.0670	6.3	838	130	726	42	690	33
69P_L09 L 128 2 0	47	34	7	0.72	10204	0.985	10.8	0.1141	7.9	0.73	8.7651	7.95	0.0626	7.4	696	157	696	55	696	52
69P_L09 L 130 2 8	134	90	18	0.67	605	0.946	7.0	0.1082	4.6	0.66	9.2406	4.62	0.0634	5.2	723	111	676	34	662	29
69P_L09 L 131 2 9	85	130	14	1.53	1687	1.009	7.1	0.1135	5.0	0.71	8.8096	5.04	0.0645	4.9	758	104	709	36	693	33

69P_L09 L 132 2 -7	51	49	7	0.95	2115	0.920	8.7	0.1099	4.1	0.47	9.0978	4.10	0.0607	7.6	629	164	663	42	672	26
69P_L09 L 133 2 -6	74	43	10	0.59	952	0.992	9.1	0.1165	5.4	0.59	8.5866	5.39	0.0618	7.3	667	156	700	46	710	36
69P_L09 L 134 2 15	139	94	19	0.68	626	1.013	6.6	0.1115	4.1	0.63	8.9688	4.14	0.0659	5.1	803	107	710	34	681	27
69P_L09 L 135 2 12	124	83	17	0.67	3002	1.017	4.3	0.1131	3.1	0.71	8.8423	3.08	0.0652	3.0	782	64	713	22	691	20
69P_L09 L 136 2 0	87	76	13	0.87	1034	1.008	6.6	0.1160	4.5	0.67	8.6177	4.47	0.0630	4.9	708	104	708	34	708	30
69P_L09 L 139 2 -5	46	39	7	0.85	325	1.098	10.1	0.1256	7.9	0.78	7.9641	7.90	0.0634	6.4	723	135	752	54	763	57
69P_L09 L 141 2 -20	55	48	9	0.87	4390	1.096	11.7	0.1295	9.2	0.79	7.7250	9.22	0.0614	7.2	653	155	751	62	785	68
69P_L09 L 142 2 3	333	178	128	0.53	2037	4.323	4.3	0.2961	3.6	0.84	3.3769	3.60	0.1059	2.3	1729	43	1698	35	1672	53
69P_L09 L 144 2 -5	177	96	65	0.54	949	4.052	5.5	0.2972	4.9	0.89	3.3646	4.89	0.0989	2.5	1603	47	1645	45	1677	72
69P_L09 L 145 2 8	258	255	39	0.99	18422	0.992	6.0	0.1123	4.5	0.76	8.9056	4.52	0.0641	3.9	743	83	700	30	686	29
69P_L09 L 146 2 7	57	39	8	0.69	1277	1.009	7.4	0.1141	4.8	0.65	8.7618	4.81	0.0641	5.6	745	119	708	38	697	32
69P_L09 L 147 2 3	240	209	36	0.87	2002	1.021	5.5	0.1162	4.1	0.74	8.6032	4.11	0.0637	3.7	733	79	715	28	709	28
69P_L09 L 148 2 -5	409	827	85	2.02	2897	1.080	21.2	0.1238	20.7	0.98	8.0749	20.66	0.0633	4.6	717	98	744	112	753	147
69P_L09 L 149 2 7	109	137	44	1.26	5677	3.984	5.5	0.2782	4.9	0.89	3.5946	4.94	0.1039	2.5	1694	46	1631	45	1582	69
69P_L09 L 150 2 6	42	36	7	0.85	554	1.106	13.5	0.1222	9.5	0.71	8.1807	9.54	0.0656	9.5	794	199	756	72	743	67
69P_L09 L 151 2 5	54	38	7	0.70	1469	0.919	8.8	0.1068	6.1	0.69	9.3673	6.11	0.0625	6.4	690	136	662	43	654	38

69P_L09 L 152	2	231	176	34	0.76	420	1.003	6.0	0.1116	5.1	0.85	8.9580	5.12	0.0652	3.2	779	67	705	31	682	33	12
>20% discorant																						
69P_L09 S 43	1	112	166	16	1.48	8558	0.887	34.4	0.0906	31.2	0.91	11.0386	31.22	0.0711	14.4	959	294	645	164	559	167	42
69P_L09 S 45	1	156	158	41	1.01	2343	2.441	68.8	0.1760	63.6	0.92	5.6828	63.55	0.1006	26.2	1635	487	1255	495	1045	613	36
69P_L09 M 49	2	40	34	6	0.84	3705	1.014	214.0	0.0880	213.7	1.00	11.3607	213.69	0.0835	12.3	1282	240	711	1094	544	1114	58
69P_L09 M 52	2	38	27	6	0.71	612	1.097	16.4	0.1345	13.1	0.80	7.4352	13.12	0.0592	9.9	573	215	752	87	813	100	-42
69P_L09 M 54	2	46	33	7	0.72	173	1.148	9.6	0.1193	8.0	0.84	8.3846	8.03	0.0698	5.2	923	107	776	52	726	55	21
69P_L09 M 57	2	110	57	16	0.52	406	0.996	6.9	0.1205	5.7	0.82	8.2999	5.67	0.0599	4.0	602	87	702	35	733	39	-22
69P_L09 M 59	2	37	20	6	0.53	55	0.948	12.8	0.1256	5.5	0.43	7.9627	5.46	0.0548	11.6	403	260	677	63	763	39	-89
69P_L09 M 72	2	37	52	8	1.41	108	1.906	27.6	0.1350	11.3	0.41	7.4063	11.29	0.1024	25.1	1668	465	1083	183	816	87	51
69P_L09 M 73	2	33	28	10	0.85	167	2.388	17.6	0.2486	15.1	0.86	4.0226	15.06	0.0697	9.1	918	187	1239	126	1431	193	-56
69P_L09 M 74	2	53	87	12	1.65	274	1.209	10.7	0.1462	7.0	0.66	6.8406	7.03	0.0600	8.0	603	173	805	59	880	58	-46
69P_L09 M 76	2	40	32	6	0.79	1005	1.106	9.9	0.1110	3.8	0.38	9.0120	3.79	0.0723	9.1	994	186	756	53	678	24	32
69P_L09 M 78	2	49	29	7	0.60	369	0.947	11.2	0.1165	5.7	0.51	8.5854	5.70	0.0589	9.7	565	210	676	55	710	38	-26
69P_L09 M 83	2	190	126	33	0.66	793	1.150	10.9	0.1347	8.8	0.81	7.4220	8.83	0.0619	6.4	671	136	777	59	815	68	-22
69P_L09 M 89	2	161	118	23	0.74	534	0.970	9.2	0.1059	7.2	0.78	9.4415	7.19	0.0664	5.8	819	121	688	46	649	44	21

Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{235}U$	±2s (%)	$^{206}Pb/^{238}U$	±2s (%)	error corr.	$^{238}U/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$ (abs)	±2s	$^{207}Pb/^{235}U$ (abs)	±2s	$^{206}Pb/^{238}U$ (abs)	±2s	% disc.
69P_L09 M 95	2	54	42	7	0.78	6385	0.987	8.8	0.1025	5.1	0.59	9.7565	5.15	0.0698	7.1	923	147	697	44	629	31	32
69P_L09 M 98	2	62	33	9	0.53	1175	1.069	10.4	0.1137	8.4	0.81	8.7989	8.43	0.0682	6.1	875	126	738	55	694	55	21
69P_L09 L 108	2	164	96	23	0.59	3533	1.028	7.1	0.1083	5.5	0.78	9.2372	5.53	0.0689	4.4	896	91	718	36	663	35	26
69P_L09 L 115	2	30	16	4	0.55	2002	1.065	12.2	0.1109	7.7	0.63	9.0146	7.66	0.0696	9.5	917	195	736	64	678	49	26
69P_L09 L 117	2	127	64	18	0.51	1509	1.063	5.5	0.1116	4.3	0.79	8.9635	4.32	0.0691	3.4	902	70	735	29	682	28	24
69P_L09 L 119	2	20	11	3	0.57	61	0.931	15.2	0.1168	7.7	0.51	8.5611	7.73	0.0578	13.1	522	287	668	74	712	52	-36
69P_L09 L 124	2	67	88	14	1.30	680	1.210	10.8	0.1400	7.1	0.66	7.1412	7.09	0.0627	8.1	697	172	805	60	845	56	-21
69P_L09 L 125	2	46	27	7	0.58	145	1.076	8.3	0.1288	4.4	0.53	7.7659	4.37	0.0606	7.0	625	152	742	44	781	32	-25
69P_L09 L 127	2	51	38	8	0.74	230	0.912	11.7	0.1186	4.5	0.38	8.4335	4.52	0.0558	10.8	444	241	658	57	722	31	-63
69P_L09 L 129	2	123	160	20	1.30	1243	1.150	10.9	0.1111	4.3	0.39	9.0043	4.27	0.0751	10.0	1071	201	777	59	679	28	37
69P_L09 L 137	2	40	64	9	1.58	211	1.660	21.9	0.1367	11.9	0.54	7.3135	11.87	0.0881	18.3	1384	352	994	138	826	92	40
69P_L09 L 138	2	184	376	37	2.05	658	1.085	8.7	0.1314	7.6	0.87	7.6132	7.58	0.0599	4.3	601	93	746	46	796	57	-32
69P_L09 L 153	2	358	112	99	0.31	4128	3.242	4.4	0.2227	4.1	0.92	4.4899	4.07	0.1056	1.8	1724	32	1467	34	1296	48	25

70PL09

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70P_L09 S 1-1	1	103	133	40	1.30	5958	3.551	6.1	0.2703	5.4	0.89	3.6998	5.36	0.0953	2.8	1533	53	1539	48	1542	74
70P_L09 S 40	1	266	52	95	0.20	9521	4.433	7.5	0.3062	6.8	0.91	3.2657	6.79	0.1050	3.1	1714	57	1718	62	1722	103
70P_L09 S 61	1	198	57	70	0.29	10249	4.302	5.0	0.2986	4.7	0.93	3.3494	4.68	0.1045	1.8	1706	34	1694	41	1684	69
70P_L09 S 71	1	180	78	107	0.43	24618	10.097	5.8	0.4589	5.4	0.93	2.1789	5.39	0.1596	2.1	2451	36	2444	53	2435	109
70P_L09 S 93	1	161	86	59	0.53	2217	4.105	5.4	0.2881	4.9	0.91	3.4711	4.93	0.1033	2.2	1685	40	1655	44	1632	71
70P_L09 S 1014	1	378	287	54	0.76	1808	1.008	5.5	0.1115	4.0	0.73	8.9672	4.00	0.0656	3.7	792	78	708	28	682	26
70P_L09 S 114	1	118	84	32	0.72	1926	2.451	7.3	0.2119	6.1	0.83	4.7202	6.06	0.0839	4.0	1290	79	1258	53	1239	68
70P_L09 S 159	1	163	94	51	0.58	3719	3.813	4.4	0.2682	3.4	0.78	3.7291	3.44	0.1031	2.7	1681	50	1595	35	1531	47
70P_L09 S 1616	1	328	139	41	0.42	3638	0.938	6.6	0.1050	6.0	0.91	9.5218	5.97	0.0648	2.8	767	58	672	32	644	37
70P_L09 S 189	1	187	148	71	0.79	3041	4.127	5.5	0.2806	4.9	0.89	3.5634	4.92	0.1067	2.5	1743	45	1660	45	1595	70
70P_L09 S 1910	1	70	46	15	0.65	419	1.809	7.1	0.1701	5.6	0.79	5.8795	5.63	0.0772	4.4	1125	87	1049	47	1013	53
70P_L09 S 207	1	209	89	77	0.43	4538	4.477	6.6	0.2950	6.0	0.90	3.3901	5.97	0.1101	2.8	1801	51	1727	55	1666	88
70P_L09 S 2111	1	180	110	51	0.61	2909	2.708	6.2	0.2184	4.5	0.73	4.5780	4.51	0.0899	4.2	1424	81	1331	46	1274	52
70P_L09 S 229	1	116	27	37	0.23	1136	3.893	7.2	0.2708	6.1	0.84	3.6929	6.09	0.1043	3.9	1702	72	1612	58	1545	84
70P_L09 S 235	1	126	46	36	0.37	780	2.905	8.1	0.2335	6.8	0.84	4.2819	6.77	0.0902	4.4	1430	84	1383	61	1353	83

70P_L09 S 24 6	1	203	103	72	0.51	14764	4.090	5.5	0.2824	4.9	0.90	3.5406	4.90	0.1050	2.4	1715	44	1652	45	1604	70
70P_L09 S 25 9	1	121	50	41	0.41	2884	3.844	8.1	0.2688	6.8	0.84	3.7207	6.80	0.1037	4.4	1692	81	1602	65	1535	93
70P_L09 S 26 14	1	86	61	18	0.70	715	1.850	10.1	0.1697	8.1	0.80	5.8916	8.07	0.0791	6.0	1174	119	1064	66	1011	75
70P_L09 S 27 9	1	160	70	57	0.44	3187	4.207	7.7	0.2826	7.0	0.91	3.5390	7.03	0.1080	3.2	1766	58	1675	63	1604	100
70P_L09 S 28 2	1	181	75	67	0.41	1960	4.312	8.5	0.2978	7.1	0.84	3.3578	7.08	0.1050	4.6	1715	85	1696	70	1680	105
70P_L09 S 30 2	1	723	207	97	0.29	5510	0.992	8.7	0.1140	8.3	0.95	8.7740	8.26	0.0631	2.8	713	59	700	44	696	54
70P_L09 S 31 8	1	180	91	102	0.51	1507	9.328	6.3	0.4212	5.5	0.88	2.3743	5.54	0.1606	3.1	2462	52	2371	58	2266	106
70P_L09 S 32 17	1	514	533	75	1.04	10937	0.888	5.9	0.1006	5.5	0.93	9.9425	5.47	0.0640	2.2	742	47	645	28	618	32
70P_L09 S 35 2	1	257	76	97	0.30	4511	4.582	6.8	0.3081	5.8	0.85	3.2454	5.82	0.1079	3.6	1763	65	1746	57	1731	88
70P_L09 S 36 8	1	176	30	58	0.17	2588	4.159	4.9	0.2823	3.9	0.80	3.5418	3.90	0.1068	2.9	1746	53	1666	40	1603	55
70P_L09 S 37 8	1	174	54	50	0.31	30957	3.071	6.9	0.2387	6.1	0.88	4.1898	6.08	0.0933	3.4	1495	64	1426	53	1380	75
70P_L09 S 38 12	1	250	108	82	0.43	4402	3.888	4.0	0.2659	3.0	0.75	3.7606	2.99	0.1060	2.6	1732	48	1611	32	1520	40
70P_L09 S 39 14	1	201	44	64	0.22	7747	3.908	4.9	0.2642	4.2	0.85	3.7854	4.18	0.1073	2.6	1754	48	1615	40	1511	56
70P_L09 S 40 11	1	128	67	18	0.52	661	0.993	7.0	0.1112	5.2	0.74	8.9898	5.20	0.0647	4.8	766	100	700	36	680	34
70P_L09 S 41 17	1	336	168	116	0.50	3645	3.936	4.6	0.2601	3.9	0.84	3.8448	3.91	0.1097	2.5	1795	45	1621	38	1490	52
70P_L09 S 42 14	1	322	148	112	0.46	5389	4.315	5.1	0.2778	4.6	0.90	3.5998	4.58	0.1126	2.2	1843	40	1696	42	1580	64

70P_L09 S 43 14	1	464	132	57	0.28	7695	0.927	6.5	0.1049	5.6	0.85	9.5357	5.58	0.0641	3.4	746	72	666	32	643	34
70P_L09 S 44 0	1	184	172	47	0.93	10022	1.873	6.8	0.1809	5.7	0.85	5.5279	5.72	0.0751	3.6	1071	72	1072	45	1072	57
70P_L09 S 45 7	1	130	103	43	0.79	7692	3.159	7.3	0.2433	6.6	0.90	4.1097	6.56	0.0941	3.2	1511	60	1447	56	1404	83
70P_L09 S 46 6	1	284	281	114	0.99	2498	3.854	6.4	0.2737	5.4	0.84	3.6535	5.38	0.1021	3.5	1663	65	1604	52	1560	75
70P_L09 S 47 8	1	125	61	47	0.49	2074	4.408	6.3	0.2923	5.5	0.87	3.4217	5.52	0.1094	3.1	1789	56	1714	52	1653	80
70P_L09 S 48 12	1	278	98	100	0.35	19990	4.393	6.9	0.2840	5.7	0.81	3.5214	5.66	0.1122	4.0	1835	73	1711	57	1611	81
70P_L09 S 49 13	1	183	59	63	0.32	923	4.316	9.0	0.2794	7.4	0.82	3.5785	7.40	0.1120	5.1	1832	92	1696	74	1589	104
70P_L09 S 50 9	1	153	92	59	0.60	2933	4.416	9.8	0.2896	8.5	0.86	3.4531	8.46	0.1106	4.9	1809	90	1715	81	1640	123
70P_L09 S 51 3	1	146	51	86	0.35	2859	10.245	8.3	0.4545	7.1	0.85	2.2003	7.09	0.1635	4.3	2492	73	2457	77	2415	143
70P_L09 S 52 -4	1	205	96	77	0.47	1543	4.001	8.8	0.2937	7.5	0.86	3.4049	7.53	0.0988	4.5	1602	83	1634	71	1660	110
70P_L09 S 53 19	1	197	172	30	0.87	1205	0.994	9.7	0.1084	8.1	0.84	9.2233	8.13	0.0665	5.3	822	110	701	49	664	51
70P_L09 S 56 0	1	82	34	31	0.41	3957	4.332	10.0	0.3019	8.5	0.85	3.3124	8.54	0.1041	5.2	1698	96	1700	83	1701	128
70P_L09 S 60 4	1	448	153	57	0.34	1453	0.908	9.1	0.1060	7.5	0.82	9.4314	7.46	0.0621	5.2	677	110	656	44	650	46
70P_L09 S 61 -1	1	128	40	77	0.32	1985	10.304	8.9	0.4678	7.7	0.87	2.1375	7.74	0.1597	4.4	2453	75	2462	83	2474	159
70P_L09 S 63 9	1	313	94	112	0.30	2694	4.289	10.8	0.2852	9.3	0.86	3.5068	9.33	0.1091	5.5	1784	100	1691	89	1617	133
70P_L09 S 65 0	1	182	55	68	0.30	1262	4.477	9.9	0.3064	6.5	0.66	3.2641	6.53	0.1060	7.4	1731	136	1727	82	1723	99

70P_L09 S 66	1	132	42	50	0.32	1518	4.819	11.4	0.3062	8.6	0.76	3.2657	8.59	0.1141	7.4	1866	134	1788	96	1722	130	8
70P_L09 S 67	1	202	81	73	0.40	5012	4.317	8.4	0.2872	7.8	0.93	3.4824	7.82	0.1090	3.2	1783	57	1697	69	1627	112	9
70P_L09 S 69	1	845	353	112	0.42	2051	0.918	9.7	0.1056	6.4	0.66	9.4739	6.44	0.0631	7.3	712	156	661	47	647	40	9
70P_L09 S 70	1	784	284	107	0.36	1570	0.950	13.4	0.1132	11.1	0.83	8.8361	11.13	0.0609	7.5	636	162	678	66	691	73	-9
70P_L09 S 72	1	310	115	47	0.37	3687	1.078	12.6	0.1273	10.3	0.82	7.8585	10.34	0.0614	7.3	654	156	743	67	772	75	-18
70P_L09 S 74	1	100	29	40	0.29	1673	5.089	10.4	0.3309	8.6	0.83	3.0218	8.57	0.1115	5.8	1825	106	1834	88	1843	137	-1
70P_L09 S 75	1	422	201	139	0.48	7089	3.719	9.8	0.2729	7.8	0.80	3.6639	7.85	0.0988	5.9	1602	110	1576	78	1556	108	3
70P_L09 S 76	1	104	31	42	0.29	951	5.021	16.3	0.3279	14.9	0.91	3.0496	14.87	0.1111	6.8	1817	123	1823	138	1828	237	-1
70P_L09 S 77	1	453	65	161	0.14	5473	4.470	9.9	0.2950	8.4	0.84	3.3902	8.36	0.1099	5.3	1798	97	1725	82	1666	123	7
70P_L09 S 78	1	199	70	69	0.35	2991	4.103	10.6	0.2831	8.6	0.82	3.5323	8.63	0.1051	6.1	1716	112	1655	86	1607	123	6
70P_L09 S 79	1	266	80	96	0.30	2419	4.149	10.6	0.2950	7.2	0.68	3.3899	7.21	0.1020	7.7	1661	143	1664	86	1666	106	0
70P_L09 L 311	2	128	31	46	0.25	641	4.348	8.8	0.2990	7.8	0.88	3.3442	7.77	0.1054	4.2	1722	76	1702	73	1686	115	2
70P_L09 L 312	2	141	53	51	0.38	1988	4.266	5.2	0.2901	4.5	0.85	3.4469	4.50	0.1066	2.6	1743	48	1687	43	1642	65	6
70P_L09 L 314	2	398	423	61	1.06	4780	0.955	6.9	0.1092	5.8	0.83	9.1574	5.77	0.0635	3.8	724	80	681	34	668	37	8
70P_L09 L 315	2	186	131	103	0.71	7346	8.337	7.6	0.3924	6.8	0.89	2.5481	6.84	0.1541	3.3	2392	56	2268	69	2134	124	11
70P_L09 L 317	2	112	37	42	0.33	3342	4.423	6.1	0.3114	5.2	0.84	3.2108	5.16	0.1030	3.2	1679	59	1717	50	1748	79	-4

70P_L09	L	318	2	76	33	27	0.44	537	4.193	6.3	0.2882	5.1	0.81	3.4700	5.14	0.1055	3.6	1723	66	1673	51	1632	74	5
70P_L09	L	319	2	129	83	42	0.65	120334	3.229	6.7	0.2537	5.3	0.78	3.9419	5.27	0.0923	4.1	1474	77	1464	52	1457	69	1
70P_L09	L	320	2	88	103	30	1.17	1176	3.019	5.9	0.2452	4.9	0.82	4.0786	4.88	0.0893	3.3	1411	62	1412	45	1414	62	0
70P_L09	L	321	2	161	99	64	0.62	254324	4.306	5.1	0.3108	4.4	0.85	3.2177	4.45	0.1005	2.5	1633	47	1694	42	1745	68	-7
70P_L09	L	322	2	160	119	62	0.74	1874	4.307	5.4	0.2863	4.7	0.85	3.4924	4.68	0.1091	2.7	1785	49	1695	44	1623	67	9
70P_L09	L	323	2	196	149	77	0.76	5111	4.217	4.7	0.2878	4.0	0.83	3.4744	3.96	0.1063	2.5	1736	45	1677	38	1631	57	6
70P_L09	L	324	2	358	119	123	0.33	7518	3.650	2.9	0.2524	2.6	0.84	3.9624	2.55	0.1049	1.3	1713	24	1561	23	1451	33	15
70P_L09	L	325	2	134	63	48	0.47	6425	4.146	4.0	0.2865	3.3	0.81	3.4906	3.34	0.1050	2.2	1714	40	1663	33	1624	48	5
70P_L09	L	326	2	111	31	31	0.28	9019	3.131	5.7	0.2455	4.3	0.73	4.0733	4.26	0.0925	3.8	1477	72	1440	44	1415	54	4
70P_L09	L	327	2	113	41	33	0.37	2074	3.297	6.1	0.2513	4.8	0.77	3.9794	4.76	0.0951	3.8	1531	71	1480	47	1445	62	6
70P_L09	L	328	2	174	155	73	0.89	2398	4.745	4.2	0.3045	3.5	0.80	3.2841	3.46	0.1130	2.3	1848	42	1775	35	1714	52	7
70P_L09	L	329	2	95	89	43	0.94	852	5.095	4.4	0.3378	3.4	0.74	2.9600	3.36	0.1094	2.8	1789	51	1835	37	1876	55	-5
70P_L09	S	83	3	53	40	42	0.75	1350	14.925	12.9	0.5582	11.5	0.89	1.7916	11.48	0.1939	5.8	2776	95	2810	122	2859	265	-3
70P_L09	S	84	3	93	23	61	0.24	796	14.085	14.2	0.5050	12.9	0.91	1.9803	12.94	0.2023	5.8	2845	95	2755	134	2635	280	7
70P_L09	S	86	3	313	153	43	0.49	553	0.911	9.8	0.1119	7.8	0.79	8.9375	7.77	0.0591	6.0	570	130	658	48	684	50	-20
70P_L09	S	88	3	553	220	74	0.40	1076	0.925	10.4	0.1083	9.8	0.94	9.2362	9.80	0.0619	3.4	672	73	665	51	663	62	1

70P_L09 S 90	3	174	90	60	0.52	576	4.001	9.1	0.2677	8.1	0.88	3.7348	8.06	0.1084	4.3	1772	79	1634	74	1529	110	14
70P_L09 S 91	3	322	206	44	0.64	1033	0.950	9.0	0.1056	7.2	0.80	9.4716	7.22	0.0653	5.3	784	112	678	44	647	44	17
70P_L09 S 92	3	358	264	50	0.74	1383	0.904	9.9	0.1071	8.0	0.81	9.3341	8.03	0.0612	5.7	645	123	654	48	656	50	-2
70P_L09 S 93	3	272	79	102	0.29	33584	4.660	9.9	0.2955	9.0	0.90	3.3844	8.96	0.1144	4.3	1870	78	1760	83	1669	132	11
70P_L09 S 94	3	792	357	107	0.45	4478	0.933	10.8	0.1097	9.7	0.90	9.1118	9.67	0.0616	4.7	661	102	669	53	671	62	-2
70P_L09 S 95	3	175	106	61	0.60	2537	3.912	9.5	0.2757	8.2	0.87	3.6269	8.19	0.1029	4.7	1677	87	1616	76	1570	114	6
70P_L09 S 97	3	872	395	110	0.45	105248	0.869	9.0	0.0988	7.7	0.86	10.1258	7.74	0.0638	4.7	736	99	635	43	607	45	18
70P_L09 S 98	3	260	157	139	0.60	12270	7.922	9.3	0.3744	7.8	0.84	2.6708	7.85	0.1535	5.0	2385	86	2222	84	2050	138	14
70P_L09 S 100	3	75	36	27	0.48	788	4.332	8.8	0.2972	6.9	0.78	3.3650	6.87	0.1057	5.6	1727	102	1699	73	1677	101	3
70P_L09 S 102	3	228	148	34	0.65	692	1.041	13.2	0.1186	11.4	0.87	8.4302	11.42	0.0637	6.6	731	140	725	68	723	78	1
70P_L09 S 3	4	359	259	49	0.72	3165	1.012	7.2	0.1122	5.9	0.82	8.9143	5.94	0.0654	4.1	788	85	710	37	685	39	13
70P_L09 S 6	4	67	53	10	0.79	213	1.016	8.3	0.1110	5.4	0.65	9.0129	5.41	0.0664	6.3	820	131	712	42	678	35	17
70P_L09 S 11	4	613	313	94	0.51	14801	1.167	15.2	0.1325	15.0	0.99	7.5487	15.01	0.0639	2.5	738	53	785	83	802	113	-9
70P_L09 S 12	4	35	27	5	0.76	117	0.959	10.9	0.1067	6.5	0.60	9.3739	6.50	0.0652	8.7	781	184	683	54	653	40	16
70P_L09 S 18	4	160	100	67	0.63	1026	4.941	14.5	0.3308	14.2	0.98	3.0227	14.23	0.1083	2.5	1771	46	1809	122	1842	228	-4
70P_L09 S 20	4	137	60	54	0.44	573	4.682	10.6	0.3233	10.1	0.96	3.0928	10.14	0.1050	3.0	1715	56	1764	89	1806	160	-5

Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{235}U$	±2s (%)	$^{206}Pb/^{238}U$	±2s (%)	error corr.	$^{238}U/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$ (abs)	±2s	$^{207}Pb/^{235}U$ (abs)	±2s	$^{206}Pb/^{238}U$ (abs)	±2s	% disc.
70P_L09 S 21	4	264	98	92	0.37	4603	4.300	6.9	0.3013	6.3	0.91	3.3193	6.28	0.1035	2.9	1688	53	1693	57	1698	94	-1
70P_L09 S 22	4	348	39	104	0.11	826	3.901	5.6	0.2747	5.4	0.95	3.6408	5.38	0.1030	1.7	1679	32	1614	46	1564	75	7
70P_L09 S 24	4	188	152	72	0.81	5473	4.589	7.8	0.2922	6.3	0.80	3.4225	6.29	0.1139	4.7	1863	85	1747	65	1652	92	11
70P_L09 S 25	4	221	118	86	0.53	1962	4.853	49.6	0.3036	49.3	0.99	3.2942	49.31	0.1160	5.6	1895	101	1794	418	1709	740	10
70P_L09 S 26	4	281	315	286	1.12	47	20.723	18.5	0.4555	9.9	0.54	2.1955	9.91	0.3300	15.6	3617	239	3126	179	2420	200	33
70P_L09 S 32	4	308	115	135	0.37	5367	5.366	48.8	0.3631	48.6	1.00	2.7539	48.60	0.1072	3.9	1752	72	1879	417	1997	835	-14
70P_L09 S 36	4	1324	150	386	0.11	3373	4.345	36.5	0.2993	36.3	0.99	3.3409	36.30	0.1053	3.7	1719	68	1702	301	1688	539	2
>20% discordant																						
70P_L09 S 29	1	485	143	144	0.30	1420	3.802	10.6	0.2444	9.4	0.89	4.0917	9.40	0.1128	4.9	1845	89	1593	85	1410	119	24
70P_L09 S 16	4	64	42	9	0.66	905	1.026	10.1	0.1071	5.9	0.59	9.3338	5.93	0.0694	8.2	912	168	717	52	656	37	28
70P_L09 S 13	4	54	37	8	0.68	2580	1.286	16.7	0.1155	13.2	0.79	8.6548	13.22	0.0807	10.2	1214	201	839	95	705	88	42
70P_L09 S 31	4	63	77	49	1.21	718	8.553	39.2	0.5388	38.9	0.99	1.8561	38.86	0.1151	5.1	1882	91	2292	356	2778	877	-48
70P_L09 S 35	4	243	75	27	0.31	390	0.902	33.7	0.0844	32.2	0.96	11.8505	32.22	0.0776	10.0	1136	199	653	162	522	162	54
70P_L09 S 8	4	38	40	4	1.05	722	0.888	157.5	0.0630	154.9	0.98	15.8642	154.89	0.1021	28.7	1663	531	645	752	394	592	76

Scout 2
<20% discordant

Scout2 S 335	1	367	250	55	0.68	3159	1.077	8.1	0.1174	6.4	0.78	8.5205	6.37	0.0666	5.0	824	104	742	43	715	43	13
Scout2 S 336	1	204	126	28	0.62	6891	0.957	8.0	0.1119	5.2	0.64	8.9373	5.18	0.0620	6.0	674	129	682	39	684	34	-1
Scout2 S 337	1	136	90	20	0.66	605	1.052	10.8	0.1185	8.0	0.73	8.4366	7.97	0.0643	7.3	753	154	730	56	722	54	4
Scout2 S 338	1	441	423	70	0.96	5254	0.988	9.1	0.1140	7.4	0.81	8.7697	7.40	0.0628	5.2	702	112	698	46	696	49	1
Scout2 S 342	1	150	79	22	0.53	63163	1.027	9.1	0.1195	6.0	0.65	8.3648	6.01	0.0623	6.9	684	147	717	47	728	41	-6
Scout2 S 344	1	236	143	31	0.61	476	0.935	8.2	0.1054	5.8	0.70	9.4878	5.82	0.0644	5.8	753	122	670	40	646	36	14
Scout2 S 349	1	1078	517	146	0.48	18434	0.822	7.3	0.0959	6.4	0.86	10.4271	6.36	0.0621	3.6	678	77	609	33	590	36	13
Scout2 S 351	1	582	354	86	0.61	9371	0.976	9.4	0.1132	8.6	0.91	8.8361	8.64	0.0626	3.8	694	81	692	47	691	57	0
Scout2 S 352	1	164	46	20	0.28	655	0.929	8.4	0.1091	5.5	0.65	9.1621	5.55	0.0617	6.3	665	134	667	41	668	35	0
Scout2 S 354	1	438	390	67	0.89	4246	0.966	6.6	0.1082	5.2	0.77	9.2449	5.16	0.0648	4.1	766	86	686	33	662	32	14
Scout2 S 357	1	164	77	22	0.47	2153	0.984	7.5	0.1125	5.9	0.78	8.8902	5.87	0.0635	4.6	724	98	696	38	687	38	5
Scout2 S 358	1	138	64	18	0.46	270	1.007	8.4	0.1118	6.8	0.81	8.9439	6.84	0.0653	4.9	785	103	707	43	683	44	13
Scout2 S 359	1	217	163	32	0.75	1200	0.973	9.4	0.1116	6.6	0.70	8.9568	6.60	0.0632	6.6	716	141	690	47	682	43	5
Scout2 S 361	1	143	88	20	0.61	811	1.031	8.3	0.1146	5.9	0.71	8.7272	5.92	0.0653	5.8	783	122	720	43	699	39	11

Scout2 S 363	2	138	88	19	0.63	557	0.932	8.3	0.1069	4.7	0.55	9.3506	4.66	0.0632	6.9	714	147	668	41	655	29	8
Scout2 S 364	2	175	131	24	0.75	8566	0.937	8.4	0.1044	5.4	0.63	9.5807	5.35	0.0651	6.5	777	137	671	41	640	33	18
Scout2 S 365	2	153	77	19	0.50	2262	0.859	6.1	0.1046	4.0	0.63	9.5644	3.96	0.0596	4.7	589	101	630	29	641	24	-9
Scout2 S 368	2	173	87	21	0.50	337	0.901	6.9	0.1024	4.6	0.65	9.7645	4.56	0.0638	5.2	734	109	652	33	629	27	14
Scout2 S 375	2	232	102	29	0.44	966	0.900	7.0	0.1037	5.2	0.74	9.6389	5.20	0.0629	4.6	706	99	652	34	636	32	10
Scout2 S 376	2	151	68	19	0.45	556	0.923	7.9	0.1053	5.2	0.65	9.4995	5.24	0.0636	6.0	729	127	664	39	645	32	12
Scout 2 L 1	3	134	77	17	0.57	759	0.892	5.9	0.1060	4.7	0.78	9.4337	4.69	0.0610	3.6	641	78	647	28	649	29	-1
Scout 2 L 2	3	161	83	21	0.51	292	0.917	6.6	0.1052	4.5	0.67	9.5099	4.51	0.0632	4.8	715	103	661	32	645	28	10
Scout 2 L 4	3	140	68	17	0.48	559	0.920	6.1	0.1023	4.3	0.70	9.7782	4.34	0.0652	4.3	781	91	662	30	628	26	20
>20% discordant																						
Scout2 S 334	1	703	259	92	0.37	1423	1.016	5.4	0.1017	4.6	0.83	9.8341	4.55	0.0725	2.9	999	59	712	28	624	27	37
Scout2 S 346	1	556	423	95	0.76	775	1.124	16.0	0.1158	9.6	0.60	8.6350	9.62	0.0704	12.8	940	262	765	86	706	64	25
Scout2 S 347	1	1474	739	203	0.50	1772	0.836	7.8	0.0878	5.5	0.70	11.3923	5.52	0.0691	5.5	902	114	617	36	542	29	40
Scout2 S 350	1	1003	503	138	0.50	2091	0.940	7.3	0.0988	6.7	0.91	10.1177	6.66	0.0690	2.9	898	59	673	36	608	39	32
Scout2 S 356	1	278	215	41	0.77	1226	1.041	12.4	0.1099	9.9	0.79	9.0990	9.86	0.0687	7.5	890	155	724	64	672	63	24
Scout2 S 367	2	150	79	19	0.52	271	0.941	7.4	0.1023	3.1	0.41	9.7708	3.12	0.0667	6.7	827	140	673	36	628	19	24

Scout2 S 370	2	147	116	22	0.79	362	1.073	10.8	0.1105	6.7	0.62	9.0482	6.69	0.0704	8.4	940	173	740	57	676	43	28
Scout2 S 372	2	1337	605	179	0.45	3290	0.874	7.7	0.0913	5.9	0.75	10.9587	5.90	0.0695	5.0	912	103	638	37	563	32	38
Scout2 S 373	2	2229	936	267	0.42	3476	0.673	6.6	0.0743	6.2	0.93	13.4662	6.19	0.0658	2.3	799	48	523	27	462	28	42
Scout2 S 378	2	141	64	18	0.46	254	0.966	8.4	0.1025	6.4	0.76	9.7546	6.41	0.0683	5.4	878	112	686	42	629	38	28
Scout 2 L 3	3	161	108	21	0.67	509	0.910	6.6	0.1007	5.0	0.74	9.9305	4.95	0.0656	4.4	792	92	657	32	619	29	22
Scout 2 L 5	3	1084	1389	162	1.28	23620	0.760	4.6	0.0867	4.0	0.84	11.5283	3.98	0.0635	2.4	726	51	574	20	536	20	26

Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{235}U$	±2s (%)	$^{206}Pb/^{238}U$	±2s (%)	error corr.	$^{238}U/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (abs)	$^{207}Pb/^{235}U$	±2s (abs)	$^{206}Pb/^{238}U$	±2s (abs)	% disc.

Scout 3
<20% discordant

Scout3 S 380	1	115	61	17	0.53	3170	1.125	11.1	0.1268	9.0	0.81	7.8839	9.05	0.0643	6.5	753	137	765	60	770	66	-2
Scout3 S 383	1	164	95	22	0.58	246	0.945	7.3	0.1119	5.4	0.73	8.9393	5.37	0.0612	4.9	648	105	675	36	684	35	-6
Scout3 S 384	1	154	94	21	0.61	2458	0.933	9.0	0.1107	6.1	0.67	9.0366	6.07	0.0611	6.6	643	142	669	44	677	39	-5
Scout3 S 386	1	223	179	31	0.80	314	0.951	7.7	0.1073	6.2	0.80	9.3209	6.21	0.0643	4.6	751	97	679	38	657	39	12
Scout3 S 387	1	107	77	16	0.71	239	1.046	11.2	0.1160	7.9	0.70	8.6236	7.92	0.0654	7.9	787	167	727	58	707	53	10
Scout3 S 388	1	122	70	17	0.57	705	1.023	12.4	0.1144	9.8	0.78	8.7433	9.76	0.0648	7.7	769	162	715	64	698	65	9

Scout3 S 389 9	1	142	80	19	0.56	2124	0.951	7.9	0.1084	5.3	0.66	9.2239	5.30	0.0636	5.9	729	125	679	39	664	33
Scout3 S 390 -3	1	199	93	27	0.47	2632	0.999	8.2	0.1161	6.5	0.78	8.6113	6.46	0.0624	5.0	688	107	703	42	708	43
Scout3 S 391 6	1	120	58	16	0.49	572	1.005	11.2	0.1139	8.6	0.76	8.7807	8.60	0.0640	7.2	742	153	706	57	695	57
Scout3 S 392 -5	1	172	93	23	0.54	341	0.937	8.0	0.1110	6.7	0.83	9.0068	6.72	0.0612	4.3	646	93	671	39	679	43
Scout3 S 393 15	1	126	63	17	0.50	703	1.042	8.0	0.1140	6.5	0.81	8.7711	6.54	0.0663	4.6	816	97	725	42	696	43
Scout3 S 394 3	1	181	96	25	0.53	827	0.994	7.5	0.1141	6.1	0.81	8.7650	6.13	0.0632	4.3	715	91	701	38	696	40
Scout3 S 396 7	1	183	113	25	0.62	3425	0.945	9.2	0.1085	6.8	0.74	9.2203	6.83	0.0632	6.2	716	131	676	45	664	43
Scout3 S 397 4	1	149	80	19	0.54	428	0.884	8.4	0.1040	5.7	0.67	9.6166	5.70	0.0617	6.1	662	132	643	40	638	35
Scout3 S 398 -3	1	123	75	17	0.60	1048	0.931	7.3	0.1099	4.7	0.63	9.1018	4.71	0.0615	5.6	655	119	668	36	672	30
Scout3 S 400 1	1	127	62	17	0.49	783	0.998	7.1	0.1150	5.5	0.77	8.6946	5.50	0.0630	4.5	707	95	703	36	702	37
Scout3 S 402 -3	1	110	56	15	0.50	647	0.965	9.0	0.1132	6.2	0.68	8.8358	6.18	0.0618	6.6	669	141	686	45	691	41
Scout3 S 403 13	1	134	62	18	0.46	590	0.983	9.1	0.1098	5.9	0.64	9.1057	5.86	0.0649	6.9	771	146	695	46	672	37
Scout3 S 405 1	1	135	66	17	0.49	3505	0.928	8.9	0.1085	6.5	0.73	9.2125	6.54	0.0620	6.0	674	128	667	43	664	41
Scout3 S 406 -7	1	206	115	29	0.56	7898	0.986	8.5	0.1161	6.3	0.73	8.6098	6.29	0.0616	5.7	659	122	697	43	708	42
Scout3 S 408 -13	1	147	83	20	0.57	149	0.886	8.4	0.1081	6.2	0.73	9.2545	6.17	0.0594	5.7	584	124	644	40	661	39
Scout3 S 410 12	1	114	56	16	0.49	3229	1.035	9.4	0.1143	7.5	0.79	8.7463	7.50	0.0656	5.6	795	118	721	48	698	50

Scout3 S 411 17	1	215	143	29	0.66	4020	0.971	8.5	0.1073	6.3	0.73	9.3174	6.30	0.0656	5.7	793	120	689	43	657	39
Scout3 S 413 17	1	192	158	27	0.82	4652	0.933	6.5	0.1043	5.5	0.83	9.5896	5.54	0.0649	3.5	772	74	669	32	639	34
Scout3 S 414 -5	1	54	34	8	0.63	60	1.030	11.6	0.1194	6.5	0.55	8.3765	6.45	0.0626	9.6	694	205	719	60	727	44
Scout3 S 415 8	1	137	56	17	0.41	4869	0.892	7.1	0.1035	4.7	0.65	9.6614	4.71	0.0625	5.3	692	113	648	34	635	28
Scout3 S 418 15	1	207	125	29	0.60	147620	1.066	5.5	0.1158	4.9	0.86	8.6375	4.88	0.0668	2.6	830	55	737	29	706	33
Scout3 S 419 14	2	620	281	80	0.45	2510	0.866	6.7	0.0995	6.1	0.89	10.0520	6.06	0.0632	2.9	714	62	634	32	611	35
Scout3 S 421 16	2	200	126	26	0.63	643	0.898	6.3	0.1017	4.4	0.69	9.8332	4.42	0.0641	4.4	744	94	651	30	624	26
Scout3 S 422 9	2	175	95	22	0.54	1313	0.860	6.9	0.1004	4.5	0.64	9.9593	4.49	0.0621	5.2	678	111	630	32	617	26
Scout3 S 423 19	2	198	136	27	0.69	609	0.908	7.7	0.1017	6.5	0.83	9.8313	6.46	0.0648	4.2	767	88	656	37	624	38
Scout3 S 424 20	2	147	85	19	0.58	3592	0.966	9.1	0.1059	7.3	0.80	9.4464	7.33	0.0662	5.3	813	112	687	45	649	45
Scout3 S 425 17	2	174	96	22	0.55	4417	0.915	6.9	0.1029	4.4	0.63	9.7208	4.43	0.0645	5.3	758	112	660	34	631	27
Scout3 S 426 16	2	153	95	20	0.62	723	0.928	6.9	0.1043	4.5	0.64	9.5853	4.46	0.0645	5.2	758	111	666	34	640	27
Scout3 S 427 16	2	169	93	23	0.55	361	0.966	6.6	0.1075	5.1	0.76	9.3021	5.14	0.0652	4.2	780	89	686	33	658	32
Scout3 S 428 11	2	174	88	21	0.50	9021	0.848	7.6	0.0987	4.3	0.56	10.1305	4.33	0.0623	6.2	684	133	623	35	607	25
Scout3 S 432 19	2	172	104	22	0.61	1222	0.909	6.9	0.1016	4.8	0.69	9.8465	4.84	0.0649	4.9	771	104	656	33	624	29
Scout3 S 433 18	2	339	228	44	0.67	277	0.875	6.1	0.0989	3.9	0.62	10.1078	3.90	0.0641	4.7	745	100	638	29	608	23

Scout3 S 436 13	2	138	69	18	0.50	761	0.948	8.1	0.1068	5.4	0.66	9.3675	5.43	0.0644	6.0	755	128	677	40	654	34
Scout3 S 438 20	2	110	56	14	0.51	3420	0.960	8.2	0.1056	4.6	0.56	9.4724	4.65	0.0659	6.7	804	141	683	41	647	29
Scout3 S 442 6	2	327	239	47	0.73	2121	0.956	10.6	0.1098	8.9	0.83	9.1045	8.87	0.0631	5.8	712	123	681	53	672	57
Scout3 S 443 11	2	183	106	26	0.58	462	1.042	8.9	0.1153	6.4	0.72	8.6722	6.44	0.0655	6.1	791	128	725	46	704	43
Scout3 S 445 5	2	117	69	18	0.59	119	1.138	14.0	0.1254	8.1	0.57	7.9718	8.12	0.0658	11.5	800	240	772	76	762	58
Scout 3 L 15 18	3	182	93	23	0.51	712	0.918	6.1	0.1027	4.8	0.78	9.7350	4.79	0.0648	3.8	769	80	661	30	630	29
Scout 3 L 16 -2	3	160	121	23	0.76	543	0.929	8.0	0.1095	5.8	0.71	9.1334	5.78	0.0615	5.6	657	120	667	39	670	37
Scout 3 L 18 13	3	565	464	79	0.82	1429	0.848	7.6	0.0983	6.6	0.87	10.1695	6.64	0.0625	3.7	693	80	624	35	605	38
Scout 3 L 20 7	3	84	39	11	0.47	283	0.964	8.0	0.1100	5.7	0.71	9.0928	5.71	0.0635	5.6	727	118	685	40	673	36
Scout 3 L 21 0	3	93	53	12	0.57	260	0.926	6.2	0.1089	4.0	0.63	9.1843	3.97	0.0617	4.8	663	103	666	30	666	25
Scout 3 L 22 7	3	169	109	22	0.65	765	0.879	5.2	0.1026	3.2	0.59	9.7483	3.18	0.0622	4.1	680	89	641	25	630	19
Scout 3 L 23 7	3	166	93	21	0.56	1423	0.865	6.0	0.1013	3.7	0.62	9.8693	3.74	0.0619	4.6	670	99	633	28	622	22
Scout 3 L 25 15	3	459	375	62	0.82	791	0.871	5.7	0.0997	4.9	0.86	10.0330	4.94	0.0633	2.8	720	60	636	27	612	29
Scout 3 L 26 10	3	259	167	33	0.65	460	0.882	6.6	0.1021	5.3	0.79	9.7973	5.29	0.0627	4.0	698	85	642	32	627	32
Scout 3 L 29 11	3	258	128	31	0.50	322	0.864	5.9	0.1001	4.9	0.83	9.9867	4.95	0.0626	3.2	694	69	632	28	615	29
Scout 3 L 30 20	3	912	674	124	0.74	6960	0.822	5.3	0.0941	4.7	0.89	10.6308	4.75	0.0634	2.2	721	48	609	24	580	26

Scout 3 L 31	3	393	152	50	0.39	763	0.913	5.5	0.1049	4.7	0.84	9.5329	4.67	0.0631	2.9	712	62	659	27	643	29	10
Scout 3 L 33	3	252	209	35	0.83	751	0.914	5.8	0.1030	4.6	0.78	9.7082	4.58	0.0643	3.5	753	74	659	28	632	28	16
Scout 3 L 34	3	132	64	17	0.49	1588	0.933	6.2	0.1045	4.4	0.70	9.5736	4.36	0.0648	4.4	767	92	669	30	640	27	17
Scout 3 L 35	3	174	94	22	0.54	1285	0.906	5.9	0.1019	4.8	0.80	9.8128	4.75	0.0645	3.5	758	74	655	28	626	28	17
Scout 3 L 36	3	87	48	11	0.55	243	0.972	6.9	0.1075	5.1	0.73	9.2997	5.09	0.0655	4.7	792	98	689	35	658	32	17
Scout 3 L 37	3	141	77	19	0.55	357	0.929	6.0	0.1061	4.4	0.72	9.4257	4.37	0.0635	4.1	726	88	667	29	650	27	10
Scout 3 L 38	3	155	72	20	0.47	2179	0.909	7.1	0.1071	5.7	0.81	9.3366	5.73	0.0616	4.1	660	89	657	34	656	36	1
Scout 3 L 39	3	238	149	32	0.63	2372	0.905	7.0	0.1043	4.7	0.67	9.5855	4.72	0.0629	5.1	707	109	655	34	640	29	9
>20% discordant																						
Scout3 S 381	1	125	78	18	0.62	4809	0.976	7.3	0.1201	4.6	0.62	8.3270	4.59	0.0590	5.6	566	123	692	36	731	32	-29
Scout3 S 395	1	120	57	17	0.48	2009	1.006	8.8	0.1228	7.2	0.81	8.1448	7.23	0.0595	5.1	584	111	707	45	747	51	-28
Scout3 S 404	1	147	77	20	0.52	708	1.025	7.9	0.1094	6.2	0.78	9.1397	6.15	0.0679	4.9	866	101	716	40	669	39	23
Scout3 S 409	1	188	85	23	0.45	1891	0.924	8.2	0.1006	5.8	0.69	9.9386	5.79	0.0666	5.9	826	123	665	40	618	34	25
Scout3 S 412	1	1179	598	148	0.51	18887	0.782	8.8	0.0861	8.5	0.96	11.6122	8.52	0.0658	2.2	801	47	586	39	533	44	34
Scout3 S 416	1	225	141	28	0.63	756	0.903	5.9	0.0986	4.3	0.71	10.1432	4.28	0.0664	4.0	820	84	653	28	606	25	26
Scout3 S 420	2	137	78	18	0.57	264	0.969	8.8	0.1056	6.1	0.68	9.4691	6.05	0.0666	6.4	825	133	688	44	647	37	22

Scout3 S 435 36	2	96	43	12	0.45	283	1.056	8.4	0.1055	5.8	0.69	9.4811	5.84	0.0726	6.0	1004	122	732	44	646	36
Scout3 S 437 22	2	204	157	29	0.77	614	1.024	7.5	0.1095	5.7	0.75	9.1358	5.71	0.0678	4.9	863	102	716	39	670	36
Scout3 S 439 33	2	141	59	16	0.42	626	0.929	8.9	0.0977	5.2	0.57	10.2324	5.20	0.0690	7.3	898	150	667	44	601	30
Scout 3 L 14 26	3	168	100	21	0.59	1013	0.939	7.3	0.1013	5.3	0.72	9.8731	5.33	0.0672	5.0	844	104	672	36	622	32
Scout 3 L 17 21	3	143	80	18	0.56	329	0.927	6.2	0.1024	5.2	0.83	9.7654	5.19	0.0657	3.5	796	72	666	30	628	31
Scout 3 L 19 -31	3	35	13	4	0.37	248	0.895	9.1	0.1124	5.4	0.59	8.9005	5.40	0.0578	7.3	522	161	649	44	686	35
Scout 3 L 24 27	3	1200	559	144	0.47	14351	0.761	4.9	0.0867	4.6	0.92	11.5360	4.56	0.0636	1.8	729	39	574	22	536	23
Scout 3 L 27 30	3	79	41	11	0.52	2959	1.157	9.8	0.1152	5.6	0.57	8.6771	5.59	0.0728	8.0	1008	162	780	53	703	37
Scout 3 L 32 37	3	153	110	21	0.72	315	1.057	5.8	0.1048	4.0	0.68	9.5418	4.02	0.0731	4.2	1017	86	732	30	642	25

APPENDIX 2B:

BSU LA-ICPMS notes

Isotope ratios and ages are reported without initial common Pb correction; gas blank-corrected mass 204 signals were generally irresolvable from zero.

Trace element concentrations in ppm, calculated using the mean count rate method, internal standardization to 29Si, and calibration to NIST 610 and 612 glass standards.

Ablation using a 213 nm wavelength laser, spot size of 25 microns, repetition rate of 10 Hz, and fluence of ~5 J/cm2.

Trace element concentrations were deleted from analyses known to have intersected inclusions of other minerals based on P and Ti.

67PL09

1

Experiment 1 20August13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.69% (207Pb/206Pb), 1.79% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 2 20August13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.71% (207Pb/206Pb), 2.37% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

3

Experiment 2 4March15

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.50% (207Pb/206Pb), 1.49% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

4

Experiment 3 4March15

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.68% (207Pb/206Pb), 1.87% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

69PL09

1

Experiment 1 26Nov13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.87% (207Pb/206Pb), 2.21% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 2 26Nov13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.73% (207Pb/206Pb), 1.64% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

70PL09

1

Experiment 1 30July13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.66% (207Pb/206Pb), 1.43% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 3 30July13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.89% (207Pb/206Pb), 2.34% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

3

Experiment 4 30July13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.86% (207Pb/206Pb), 3.79% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

4

Experiment 1 26Nov13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.87% (207Pb/206Pb), 2.21% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

Scout 2

1

Experiment 3 30July13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.89% (207Pb/206Pb), 2.34% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 4 30July13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.86% (207Pb/206Pb), 3.79% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

3

Experiment 1 20August13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.69% (207Pb/206Pb), 1.79% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

Scout 3

1

Experiment 3 30July13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.89% (207Pb/206Pb), 2.34% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 4 30July13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.85% (207Pb/206Pb), 3.78% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

3

Experiment 1 20August13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.68% (207Pb/206Pb), 1.79% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

APPENDIX 2C:

BSU zircon LA-ICPMS concentrations

Analysis	P	Ti	Y	Nb	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	Th	U
67PL09																						
<20% discordant																						
67P_L09 S 42	183	21.9	1113	6.17	0.06	16.44	0.76	12.70	21.61	1.94	60.7	17.69	169.19	49.40	166.1	38.6	384	35.0	7770	3.26	104.2	98.4
67P_L09 S 43	230	14.1	896	18.39	0.01	26.51	0.21	5.00	7.74	1.31	30.0	10.02	116.13	37.07	152.4	36.5	407	37.5	7115	9.85	188.5	277.2
67P_L09 S 44	143	8.2	946	19.01		19.48	0.24	3.55	8.40	1.31	30.7	10.64	119.32	39.48	165.8	39.4	425	39.2	5860	8.08	61.0	139.2
67P_L09 S 45																						
67P_L09 S 52																						
67P_L09 S 54	156	8.7	846	19.62	0.05	24.00	0.20	4.33	5.82	1.08	26.0	9.17	100.71	34.31	139.0	36.4	393	34.8	7899	10.86	174.4	294.8
67P_L09 S 55																						
67P_L09 S 56																						
67P_L09 S 57	191	39.3	924	4.54	0.04	14.55	0.66	11.86	16.31	2.15	47.5	14.59	139.56	38.99	146.6	34.2	352	32.2	8126	2.78	107.4	95.3
67P_L09 S 59																						
67P_L09 S 61	169	13.3	660	6.73		13.83	0.22	4.26	6.97	0.69	25.3	8.06	88.10	27.97	98.7	25.9	264	24.0	7044	4.37	111.8	130.4
67P_L09 S 62	128	8.1	851	10.04	0.01	14.96	0.32	7.71	9.13	1.07	39.1	11.21	114.25	37.93	133.6	32.3	334	29.8	6799	5.23	83.9	131.3
67P_L09 S 65	161	8.0	733	17.92		19.84	0.11	2.76	4.66	0.84	20.6	7.38	86.02	29.60	117.5	31.5	341	32.3	7825	10.57	175.8	303.6
67P_L09 S 67																						
67P_L09 S 69	87	27.5	479	16.41	0.04	13.88	0.33	4.72	5.95	1.20	17.6	5.46	62.23	20.42	78.8	20.4	243	21.5	8046	10.21	177.6	163.3
67P_L09 S 70	174	33.2	419	8.24		8.33	0.13	1.77	4.26	0.48	15.5	5.39	52.30	17.88	64.8	16.9	191	17.9	7753	4.51	67.4	94.9
67P_L09 S 74																						
67P_L09 S 75	536	61.5	2581	12.95	0.20	17.18	1.38	26.35	45.87	5.40	147.4	40.55	376.23	104.81	360.1	83.7	852	72.2	6469	8.31	863.2	466.1
67P_L09 S 76	190	32.0	897	12.33	0.16	22.90	0.54	9.06	14.24	1.63	44.0	13.77	130.75	38.90	134.7	31.5	338	29.5	6601	6.25	667.9	305.9
67P_L09 S 77	225	40.9	520	6.59	0.09	9.49	0.27	5.14	6.80	0.88	22.5	7.16	72.87	21.70	82.1	20.0	225	19.7	6514	3.88	99.7	114.2
67P_L09 S 78																						
67P_L09 S 79	287	5.8	1605	1.76		25.64	0.48	10.24	13.00	4.94	59.0	18.37	206.73	67.25	262.4	67.6	781	73.4	7237	0.58	137.1	171.0
67P_L09 S 80	181	23.1	615	27.76		15.78	0.11	2.57	5.18	0.46	23.0	7.27	81.96	26.03	106.0	25.4	286	24.9	8440	16.60	130.1	197.0
67P_L09 S 81	252	22.7	692	1.47		13.76	0.16	3.70	7.32	1.31	29.1	8.00	86.39	28.41	106.1	28.3	313	29.9	7261	0.79	103.2	107.0
67P_L09 S 83																						

67P_L09 S 84																						
67P_L09 S 85	162	23.6	1082	8.67	2.26	19.56	1.00	14.39	14.31	2.07	55.5	15.40	153.66	44.93	168.8	38.5	426	37.1	7007	5.16	138.8	157.7
67P_L09 S 86																						
67P_L09 S 89																						
67P_L09 S 90																						
67P_L09 S 91	104	7.5	618	13.98	0.00	16.60	0.06	1.38	4.46	0.60	17.7	5.93	64.69	23.53	99.0	26.7	296	26.4	7157	8.47	101.9	246.8
67P_L09 S 93																						
67P_L09 S 94	160	18.5	647	11.44		15.49	0.11	2.93	6.96	0.79	22.5	7.68	89.55	25.00	101.9	24.3	268	23.9	6794	6.21	144.1	170.5
67P_L09 S 99																						
67P_L09 S 101	245	12.7	966	2.47		20.61	0.01	2.19	4.30	0.98	23.8	8.35	103.49	35.68	162.2	43.2	515	55.2	8620	1.26	64.8	128.9
67P_L09 S 103																						
67P_L09 S 106																						
67P_L09 S 109																						
67P_L09 S 110	113	3.2	476	1.37		17.66		0.30	2.82	1.11	12.3	3.68	46.70	17.13	77.8	20.7	247	30.3	9351	0.86	84.2	223.7
67P_L09 S 113																						
67P_L09 S 114	209	24.4	902	10.75	0.04	20.34	0.28	6.16	8.66	1.52	32.3	9.53	106.98	36.32	142.1	36.1	365	39.2	8739	6.49	136.0	165.1
67P_L09 S 115																						
67P_L09 L 235	136	34.4	379	3.45	0.03	7.37	0.13	3.01	6.06	0.93	14.7	4.74	49.79	15.46	60.5	13.9	160	15.4	7193	2.14	42.8	45.1
67P_L09 L 237																						
67P_L09 L 239	50	9.5	1965	17.39	0.07	27.40	0.30	3.86	7.88	2.55	33.9	14.49	185.47	67.76	308.5	84.0	874	85.1	8736	4.62	658.7	143.5
67P_L09 L 241	91	8.7	1882	36.22	0.03	43.58	0.60	8.28	16.36	2.52	54.1	21.10	237.73	76.34	305.7	72.2	737	67.4	5505	9.70	235.7	246.0
67P_L09 L 242	203	15.6	816	3.57		6.25	0.06	1.63	3.62	0.41	18.8	6.88	88.67	31.98	134.5	34.4	424	42.8	8984	2.05	82.7	156.2
67P_L09 L 245																						
67P_L09 L 247																						
67P_L09 L 249																						
67P_L09 L 252	91	23.1	511	3.31	0.01	5.67	0.06	1.52	3.66	0.36	14.5	4.98	58.26	20.03	83.3	19.3	197	22.6	9406	2.85	143.9	143.9
67P_L09 L 255	195	20.9	876	16.21		16.78	0.18	4.10	8.40	0.57	29.6	8.97	96.43	33.31	134.0	32.0	323	39.1	11205	9.73	155.3	180.3
67P_L09 L 256	126	55.4	509	4.47	0.02	7.20	0.20	4.11	6.24	0.53	17.9	5.90	66.60	20.37	79.3	17.7	179	22.7	10009	2.81	79.1	63.8
67P_L09 L 257	126	32.7	1228	5.67	0.06	12.38	1.13	16.96	18.99	3.35	56.0	16.51	173.04	51.18	193.4	44.2	415	49.4	11426	4.35	88.5	83.5
67P_L09 L 258	150	44.0	508	7.16	0.43	10.07	0.29	3.86	4.25	0.80	16.7	6.00	65.94	21.24	81.9	19.6	189	25.9	10857	4.56	53.9	59.9
67P_L09 L 259	137	7.4	1145	23.01	0.10	22.80	0.26	2.59	7.41	0.79	32.8	10.73	127.44	45.27	197.8	43.5	420	55.9	11697	12.86	197.8	244.4
67P_L09 L 260																						

67P_L09 L 261	189	25.4	3255	22.95	0.48	22.43	1.98	30.86	44.97	3.89	146.7	44.42	445.38	136.77		481.7	101.08	99	109.3	10075	14.10	393.8	275.8	
67P_L09 L 262	132	7.3	2175	35.65		43.89	0.35	8.41	16.35	2.25	70.5	25.55	265.83	88.80	339.0	75.7	707	87.3	9598	17.32	698.0	504.0		
67P_L09 L 263	148	13.8	3489	14.10	0.28	28.79	1.93	26.98	44.35	5.30	162.9	46.08	462.77	145.05		553.7	112.99	74	130.0	8787	6.45	347.3	224.6	
67P_L09 L 264	84	5.5	267	0.20		2.57		0.78	0.98	0.53	6.3	2.13	24.66	9.88	44.0	10.6	127	19.6	9350	0.21	54.0	111.2		
67P_L09 L 265	203	32.6	657	4.11		10.80	0.13	2.60	6.46	1.22	23.4	7.35	79.08	26.49	101.9	25.3	243	31.0	10243	2.04	59.5	58.5		
67P_L09 L 266	96	19.5	513	3.83		5.92	0.06	2.14	3.88	0.27	15.7	5.85	62.47	20.67	85.5	19.2	199	24.6	10441	3.55	117.8	117.1		
67P_L09 Bulk 189		171	8.5	536	3.15		12.64	0.04	0.59	1.48		13.1	4.09	48.10	18.45	76.6	18.6	192	23.7	9142	2.03	107.9	213.4	
67P_L09 Bulk 195		365	13.7	1061	1.44	0.05	21.06	0.35	6.37	8.57	2.15	39.0	11.34	105.89		37.93	155.5	34.5	349	46.3	7526	0.53	113.5	123.0
67P_L09 Bulk 199		107	6.5	550	0.84		9.81	0.13	2.27	3.33	1.45	15.5	5.26	51.21	19.34	78.5	17.6	187	25.4	7201	0.34	31.0	87.0	
67P_L09 Bulk 200		125	6.6	498	1.82	0.02	13.27	0.08	0.79	2.95	1.11	11.2	3.94	43.91	16.36	71.7	18.7	218	33.2	7053	0.63	73.2	195.2	
67P_L09 Bulk 204																								
67P_L09 Bulk 206		217	11.6	1651	26.64	0.07	33.65	0.63	10.65	13.89	2.04	61.3	16.94	175.59		60.38	238.3	52.8	477	57.3	6237	8.73	228.8	303.4
67P_L09 Bulk 207		50	3.6	216	0.65		16.63	0.06	0.55	1.79	0.51	5.5	1.93	20.71	6.82	31.2	8.9	97	13.9	8793	0.27	101.0	151.1	
67P_L09 Bulk 211		98	0.1	3608	39.37		30.14	0.23	4.90	13.95	2.60	91.5	34.24	415.34		134.26	519.4	111.8	938	103.2	7076	14.34	278.8	456.6
67P_L09 Bulk 222		648	11.8	1576	1.64	0.15	7.80	0.19	2.97	6.14	1.12	42.9	13.30	155.81		56.97	241.4	56.4	540	74.7	7987	0.84	108.5	187.7
67P_L09 Bulk 227		160	14.0	786	1.22	0.08	37.83	0.39	4.86	7.94	2.29	28.8	7.79	89.55	29.24	113.3	26.5	256	34.7	7319	0.56	158.4	160.6	
67P_L09 Bulk 229		113	46.8	322	2.48		6.02	0.07	1.30	2.99	0.29	11.4	3.02	34.43	11.60	43.0	10.9	104	13.0	6453	1.51	59.1	64.6	
67P_L09 Bulk 233		149	6.7	633	0.75	0.09	29.00	0.61	6.67	7.77	2.34	22.2	5.80	63.49	19.12	82.9	22.1	245	37.7	6497	0.21	322.1	231.6	

67P_L09 Bulk 234	101	5.4	319	0.45		23.63	0.12	2.02	3.86	0.96	12.2	2.58	31.19	10.36	40.9	10.1	108	15.0	7784	0.20	66.7	88.3
67P_L09 Bulk 236	205	13.6	963	18.32	0.05	25.11	0.27	3.53	8.93	0.98	25.4	8.43	102.64	36.02	147.0	31.4	313	37.9	6107	7.87	184.4	241.3
67P_L09 Bulk 240	220	11.1	1083	1.39		6.65	0.15	2.07	4.69	0.45	23.1	8.39	103.12	37.92	160.5	35.6	320	49.5	9524	0.85	82.5	122.9
67P_L09 Bulk 241	700	9.3	2352	8.22	0.11	59.07	0.33	6.18	13.18	4.18	58.1	16.62	201.87	77.20	350.6	86.7	825	131.4	11507	2.25	276.7	224.1
67P_L09 Bulk 243	218	8.6	893	2.73		15.93	0.06	1.98	4.00	0.59	19.8	7.27	89.14	33.58	136.5	31.1	304	47.3	10179	1.37	90.3	270.3
67P_L09 Bulk 246	192	38.3	520	7.54		8.69	0.16	3.23	4.14	0.51	19.7	5.55	58.00	19.22	75.3	16.7	156	19.6	7573	4.11	78.0	89.2
67P_L09 Bulk 247	40	22.3	706	2.22		7.83	0.45	7.59	9.04	0.83	28.3	8.50	87.21	25.71	106.0	22.0	201	25.7	6845	1.76	105.9	118.2
67P_L09 Bulk 249	154	31.0	414	2.73		8.86	0.08	2.49	4.34	0.63	17.4	4.88	49.84	15.30	59.3	13.2	117	15.1	6314	1.72	37.4	38.5
67P_L09 Bulk 254	225	24.9	1152	8.87	0.12	15.31	0.50	8.30	12.94	2.30	45.7	12.80	143.00	45.02	169.2	38.3	345	43.5	6631	3.76	215.0	171.7
67P_L09 Bulk 256	128	22.9	281	2.04		4.25	0.03	0.49	1.33	0.31	6.9	2.55	28.76	10.57	41.2	10.7	101	12.9	7173	1.31	11.2	28.3
67P_L09 Bulk 260	120	8.4	303	0.90		8.09	0.06	1.20	1.92	0.87	11.0	3.03	33.77	10.02	45.4	9.5	100	12.3	6881	0.27	63.2	66.7
67P_L09 Bulk 266	144	10.5	506	2.70		5.27	0.03	0.47	1.90	0.09	9.1	3.17	46.28	17.07	82.7	20.1	204	27.2	8265	1.60	47.9	124.5
67P_L09 Bulk 267	201	12.5	1573	19.34	0.03	35.25	0.52	8.45	13.62	1.94	52.0	16.34	182.15	57.00	223.8	53.8	519	58.4	6810	9.42	350.3	370.8
67P_L09 Bulk 270	115	6.2	1461	31.53		40.79	0.36	5.26	10.81	0.86	45.8	15.25	174.45	56.69	216.9	48.0	435	52.0	6147	12.46	384.9	444.2
67P_L09 Bulk 273	205	11.0	1043	2.05		41.77	0.29	6.19	9.98	1.84	39.5	11.05	112.65	37.50	147.5	34.1	321	41.4	7333	0.89	351.9	245.2
67P_L09 Bulk 275	141	9.0	348	0.89		33.39	0.07	1.59	2.75	0.87	14.8	3.51	35.45	12.58	50.9	12.6	128	16.7	7391	0.46	121.1	135.4

67P_L09 Bulk 280																						
67P_L09 Bulk 284	611	13.4	1350	0.77		4.48	0.05	0.50	3.34	0.12	25.5	9.78	124.37	47.55	198.6	49.4	470	64.9	10186	0.45	63.6	158.8
67P_L09 Bulk 286	57	7.8	1778	19.41	0.04	43.92	0.44	6.06	15.46	5.33	53.9	17.06	203.92	73.12	318.3	81.5	901	128.5	8444	4.83	1100.9	588.8
>20% discordant																						
67P_L09 S 40																						
67P_L09 S 41																						
67P_L09 S 50																						
67P_L09 S 51																						
67P_L09 S 53																						
67P_L09 S 63																						
67P_L09 S 64	231	10.6	916	6.01	0.05	12.00	0.08	1.19	3.06	0.16	22.0	8.14	95.58	36.85	156.3	41.3	468	46.7	9902	4.14	163.0	410.5
67P_L09 S 72	163	10.8	745	20.11		18.06	0.11	2.67	5.13	1.07	20.6	7.66	87.93	29.94	121.2	34.2	384	35.5	7903	12.67	150.2	373.6
67P_L09 S 73	312	17.9	940	2.52		60.28	0.21	4.96	9.43	1.63	32.2	10.55	112.39	36.39	150.7	37.6	418	40.6	7754	1.20	565.0	371.3
67P_L09 S 87																						
67P_L09 S 98	131	3.4	716	6.28		7.26	0.04	0.45	3.19	0.34	14.9	5.93	72.83	28.15	125.0	34.7	412	40.1	9880	4.22	174.8	580.6
67P_L09 S 100																						
67P_L09 S 102																						
67P_L09 S 108																						
67P_L09 L 234																						
67P_L09 L 240	53	6.6	2013	5.52	0.10	7.35	0.30	5.58	10.09	3.52	38.0	15.37	198.01	74.68	332.2	84.9	993	92.9	9928	1.55	544.3	105.4
67P_L09 L 251																						
67P_L09 Bulk 190	350	18.0	4560	45.96	0.28	92.66	2.51	37.99	56.51	8.85	196.0	56.94	572.93	168.73	628.8	142.1	1298	144.4	5780	13.19	884.8	687.0
67P_L09 Bulk 193	425	11.9	798	1.22	0.17	3.10	0.13	1.11	2.00	0.28	14.8	5.43	71.65	25.40	126.9	32.3	348	48.1	8762	1.36	47.5	279.2
67P_L09 Bulk 196																						
67P_L09 Bulk 198	422	6.5	1401	2.50	0.06	10.03	0.26	3.14	10.31	4.85	56.5	17.17	170.81	50.04	190.5	43.1	446	57.0	8657	0.62	149.5	455.2
67P_L09 Bulk 201	185	8.1	1130	7.34	0.13	22.19	0.33	3.66	4.77	2.37	31.1	9.79	103.60	37.10	169.2	38.3	384	53.3	9284	2.34	404.5	606.6

67P_L09 Bulk 202	147	9.0	1257	10.97	1.34	22.04	0.51	6.40	11.05	1.30	42.0	12.82	143.65	47.20	178.237.8	386	44.7	6459	4.89	142.0205.9
67P_L09 Bulk 209																				
67P_L09 Bulk 212																				
67P_L09 Bulk 213																				
67P_L09 Bulk 215	703	3.2	1346	3.23		10.38	0.02	1.73	3.19	0.47	20.9	8.90	125.95	46.09	195.149.3	515	67.3	8495	1.62	129.3298.8
67P_L09 Bulk 217																				
67P_L09 Bulk 225	296	17.7	956	2.65		79.61	0.42	6.18	10.67	2.63	30.2	9.76	98.1331.79135.3		32.3 327	43.6	6513	1.33	382.7	293.2
67P_L09 Bulk 230	247	25.5	957	3.57	0.34	63.67	0.58	7.54	11.97	3.77	43.1	10.30	102.11	33.19	119.927.4	296	37.0	6836	1.52	634.4557.9
67P_L09 Bulk 235																				
67P_L09 Bulk 237	195	4.2	943	6.16	0.02	7.70	0.05	1.50	1.44	0.61	14.9	6.29	83.5328.52140.4		39.0 374	48.2	9649	4.37	180.2	804.3
67P_L09 Bulk 238																				
67P_L09 Bulk 242																				
67P_L09 Bulk 252																				
67P_L09 Bulk 253	114	17.7	593	6.92	0.06	16.10	0.13	3.22	5.35	0.31	23.6	6.76	68.3621.6080.6		18.0 162	21.6	6713	2.48	64.6	84.3
67P_L09 Bulk 255	359	22.1	997	1.68	0.54	26.36	0.30	2.52	6.92	1.91	27.1	8.73	100.02	38.57	166.538.2	393	56.7	7499	0.67	45.5 78.5
67P_L09 Bulk 259	252	11.0	948	4.61	0.40	36.48	0.88	6.50	11.11	3.78	36.6	10.14	111.49	33.99	120.528.9	285	34.4	9047	1.50	506.2680.9
67P_L09 Bulk 262																				
67P_L09 Bulk 263																				
67P_L09 Bulk 265	385	270.9	2710	3.08	1.15	43.96	2.85	28.6525.71		8.73	85.7	25.33	266.65	89.91	371.789.9	878	114.0	6838	0.92	309.0395.8
67P_L09 Bulk 268	105	2.5	384	1.80		9.21	0.05	0.69	3.00	0.97	7.3	2.96	25.5610.0552.3		17.2 201	32.8	11289	1.31	101.8	799.6
67P_L09 Bulk 269	209	6.5	899	8.91		14.05	0.08	0.97	2.80	0.27	17.2	7.01	83.2430.91145.6		36.2 367	49.5	8992	5.04	232.1	537.6

67P_L09 Bulk 272																							
67P_L09 Bulk 274																							
67P_L09 Bulk 278		37	12.8	436	2.56		4.97	0.06	1.26	4.30	0.31	11.8	3.80	44.87	15.24	59.6	15.0	141	19.8	6666	1.93	125.5	174.7
67P_L09 Bulk 279		163	3.9	722	4.74		12.51	0.04	1.50	2.64	0.37	17.1	4.71	64.80	23.20	102.0	27.5	301	40.3	9573	1.92	391.9	460.1

Analysis	**P**	**Ti**	**Y**	**Nb**	**La**	**Ce**	**Pr**	**Nd**	**Sm**	**Eu**	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**	**Hf**	**Ta**	**Th**	**U**
69PL09																						
<20% discordant																						
69P_L09 S 41																						
69P_L09 S 42																						
69P_L09 S 46																						
69P_L09 M 50	197	12.8	512	6.27	0.01	17.32	0.02	0.97	2.33	0.99	12.4	4.31	57.06	20.10	79.9	18.1	186	24.9	7483	2.77	31.2	53.1
69P_L09 M 51																						
69P_L09 M 53																						
69P_L09 M 55																						
69P_L09 M 56																						
69P_L09 M 58	174	16.1	1835	16.96	0.13	52.97	1.15	15.82	21.55	4.05	77.3	23.25	245.39	74.16	265.7	62.7	565	62.1	6129	8.63	160.1	143.7
69P_L09 M 60	234	13.8	793	6.17		26.11	0.12	2.26	7.42	1.97	31.1	9.92	105.71	32.28	129.1	29.2	301	33.2	6838	3.21	38.3	48.8
69P_L09 M 61	225	8.3	1193	27.02	0.71	67.67	0.26	4.86	7.03	2.04	31.5	10.96	126.04	44.72	181.8	47.6	525	58.5	6661	8.58	198.2	226.0
69P_L09 M 62	186	12.4	454	6.43		17.86	0.02	1.32	1.19	1.01	12.5	3.80	51.01	18.60	71.4	16.7	187	22.0	6707	2.44	29.4	44.7
69P_L09 M 63	235	10.5	663	3.40	0.03	14.38	0.09	0.77	3.13	0.35	12.0	5.20	67.43	24.73	106.1	26.8	301	34.3	7190	1.65	70.7	161.5
69P_L09 M 64																						
69P_L09 M 65	182	12.5	384	4.31		17.67	0.05	1.03	2.36	1.05	13.4	4.09	44.62	14.65	59.5	16.2	167	19.0	6646	2.32	28.9	67.4
69P_L09 M 66	195	8.4	989	31.67	0.13	53.03	0.07	2.05	5.44	2.17	23.2	8.42	99.76	35.97	144.6	35.2	415	45.9	6232	11.06	69.8	119.3
69P_L09 M 67																						
69P_L09 M 68																						
69P_L09 M 69																						
69P_L09 M 70																						
69P_L09 M 71																						

69P_L09	M	75																						
69P_L09	M	77	128	11.3	478	18.69	0.04	19.36	0.17	1.98	3.83	1.12	15.9	5.69	59.34	19.84	82.5	18.5	205	20.7	5425	11.04	97.1	178.2
69P_L09	M	79																						
69P_L09	M	80																						
69P_L09	M	81																						
69P_L09	M	86	207	14.1	434	6.15		19.89	0.00	0.49	2.37	0.86	13.3	4.41	51.23	18.40	67.6	16.4	181	20.2	5916	2.79	28.5	51.4
69P_L09	M	87	153	6.1	716	28.89		44.05	0.04	1.06	3.35	0.61	16.4	4.88	65.64	25.63	110.1	29.6	344	38.6	6543	9.42	111.4	205.7
69P_L09	M	88	227	6.6	1546	35.72	0.21	79.08	0.21	4.59	8.88	3.25	35.2	13.34	164.62	56.25	243.0	62.7	700	71.6	6297	10.03	234.0	279.4
69P_L09	M	90																						
69P_L09	M	91																						
69P_L09	M	92	209	15.7	711	9.69	0.08	26.34	0.22	3.06	6.43	2.14	23.1	7.77	85.14	27.06	109.0	27.2	297	31.8	5287	3.62	33.9	62.7
69P_L09	M	93																						
69P_L09	M	94																						
69P_L09	M	96	254	15.3	926	6.48	0.06	24.52	0.26	4.98	9.38	2.78	40.6	11.94	127.08	40.88	144.7	32.6	310	33.2	6659	3.21	41.0	51.3
69P_L09	M	97																						
69P_L09	M	99																						
69P_L09	M	101																						
69P_L09	M	102																						
69P_L09	M	103	161	6.3	729	12.43		19.11	0.17	4.03	7.10	0.76	29.2	9.46	98.09	31.86	116.9	26.8	288	28.9	5068	4.51	94.6	162.5
69P_L09	M	104	154	5.8	882	11.23	0.10	16.81	0.30	5.50	9.64	0.86	38.4	11.12	124.48	40.31	140.7	30.0	325	34.3	5332	3.94	101.0	151.1
69P_L09	M	105																						
69P_L09	M	106																						
69P_L09	L	107	168	6.4	838	24.98		62.07	0.09	1.58	4.16	1.44	16.6	6.25	82.00	28.57	130.3	35.3	399	44.7	7725	9.80	265.4	316.0
69P_L09	L	109	102	19.1	2403	55.69	0.80	102.61	1.03	16.09	19.93	4.78	71.3	23.62	282.00	93.79	390.2	100.0	1065	104.4	4978	12.64	772.1	712.9
69P_L09	L	110																						
69P_L09	L	111	212	19.0	405	3.13		12.45	0.03	0.98	2.43	0.82	12.0	4.30	46.79	16.02	62.9	14.7	165	18.5	6563	1.61	20.5	36.3
69P_L09	L	112	215	11.8	472	6.71		16.87		0.95	3.06	0.84	13.1	4.49	56.03	19.20	74.5	18.8	199	22.4	6810	2.67	32.8	58.6
69P_L09	L	114	319	32.6	1082	3.07	1.71	22.33	1.03	14.53	16.83	7.97	53.3	14.96	146.29	43.44	161.7	34.7	332	38.1	5692	1.73	42.8	41.0
69P_L09	L	116																						
69P_L09	L	118																						
69P_L09	L	120	241	31.1	519	4.35	0.20	18.10	0.19	3.65	4.68	2.59	21.1	7.13	73.23	24.14	84.9	20.6	205	25.3	5942	1.85	26.8	31.2
69P_L09	L	121																						

69P_L09 L 123																						
69P_L09 L 126	208	13.8	561	5.71	0.12	16.78	0.06	1.18	1.90	0.83	14.6	4.80	60.30	22.20	91.9	20.2	201	29.0	7497	2.32	40.5	54.7
69P_L09 L 128																						
69P_L09 L 130																						
69P_L09 L 131	250	15.0	1489	8.28	1.08	54.30	1.17	13.25	19.04	7.01	64.3	18.22	186.61	54.95	219.8	48.9	469	61.6	8204	3.36	130.3	85.4
69P_L09 L 132	229	13.9	774	6.78	0.04	30.33	0.05	1.03	3.93	1.42	23.5	7.72	88.67	30.20	116.8	27.1	256	36.8	9190	2.41	48.7	51.3
69P_L09 L 133																						
69P_L09 L 134																						
69P_L09 L 135	118	6.4	810	12.65		17.70	0.18	2.60	5.73	0.31	27.4	9.35	93.57	32.24	126.2	27.2	240	33.8	6871	5.10	83.0	124.4
69P_L09 L 136																						
69P_L09 L 139																						
69P_L09 L 141	216	16.0	678	6.04	0.03	17.26	0.09	1.32	4.13	0.92	16.4	6.21	71.65	25.49	101.1	23.2	229	34.4	9220	2.79	48.1	55.1
69P_L09 L 142																						
69P_L09 L 144	263	7.3	1180	3.57		12.83	0.11	1.63	2.64	0.13	19.3	8.18	104.37	41.88	193.0	45.7	456	71.0	10716	1.54	95.9	177.5
69P_L09 L 145																						
69P_L09 L 146	209	12.7	580	6.81	0.00	17.22	0.03	1.08	1.87	0.74	13.9	5.04	61.32	21.31	89.8	21.0	210	29.6	9092	2.62	39.2	56.7
69P_L09 L 147																						
69P_L09 L 148																						
69P_L09 L 149																						
69P_L09 L 150																						
69P_L09 L 151	223	15.7	599	6.22		18.65	0.04	1.38	3.63	1.07	17.8	5.69	65.59	23.01	93.6	21.8	226	28.5	8787	3.00	38.0	54.2
69P_L09 L 152	204	6.6	1155	31.07	0.04	61.05	0.15	2.67	4.72	1.64	26.3	8.90	115.18	41.55	183.9	46.1	489	61.8	8529	11.50	176.2	230.5
>20% discordant																						
69P_L09 S 43	505	23.0	2255	21.61	1.69	63.26	1.05	14.22	23.24	5.40	97.9	27.77	278.39	85.39	329.1	69.2	596	73.9	7819	6.61	166.4	112.4
69P_L09 S 45																						
69P_L09 M 49																						
69P_L09 M 52	242	16.5	563	5.21	0.24	14.86	0.19	2.07	2.00	1.22	15.7	5.54	60.55	21.47	85.1	21.0	214	27.5	6823	2.19	27.0	38.0
69P_L09 M 54																						
69P_L09 M 57	152	5.3	638	12.56	0.33	15.75	0.08	3.19	4.78	0.31	21.1	6.77	77.72	24.77	98.8	23.3	232	26.0	6053	4.73	57.4	110.3
69P_L09 M 59	260	12.3	354	5.09	0.39	14.33	0.08	0.80	2.49	0.67	8.8	2.86	40.71	13.66	54.8	15.2	157	17.7	6947	2.21	19.9	37.4
69P_L09 M 72																						
69P_L09 M 73																						

69P_L09 M 74	197	20.4	1062	5.11	0.08	35.85	0.66	12.97	16.71	7.32	53.8	13.86	145.10	41.94	147.8	34.7	364	37.7	5025	1.73	87.5	53.1
69P_L09 M 76																						
69P_L09 M 78																						
69P_L09 M 83																						
69P_L09 M 89																						
69P_L09 M 95	219	14.4	821	7.32		24.57	0.19	3.54	9.72	3.06	34.0	10.78	112.61	33.25	124.6	27.8	299	28.5	6382	2.98	41.9	53.9
69P_L09 M 98																						
69P_L09 L 108	128	6.4	603	23.07		38.55	0.02	0.64	1.57	0.45	10.9	4.31	58.60	21.46	94.8	24.9	299	35.2	7865	8.07	96.0	163.7
69P_L09 L 115																						
69P_L09 L 117	141	8.1	617	13.26	1.50	18.58	0.62	3.57	5.07	0.53	22.8	7.05	76.82	23.40	95.9	22.1	224	24.3	5924	4.55	64.3	126.8
69P_L09 L 119	104	16.6	300	1.17		3.27	0.04	1.70	2.09	0.61	10.4	3.10	36.74	10.92	43.5	10.9	113	13.8	5096	0.56	11.1	19.6
69P_L09 L 124																						
69P_L09 L 125																						
69P_L09 L 127	213	15.3	573	6.16		23.84	0.05	1.02	3.26	0.79	14.6	5.50	65.41	21.93	83.4	20.1	215	25.3	7809	3.09	37.6	50.6
69P_L09 L 129																						
69P_L09 L 137																						
69P_L09 L 138																						
69P_L09 L 153																						

Analysis	**P**	**Ti**	**Y**	**Nb**	**La**	**Ce**	**Pr**	**Nd**	**Sm**	**Eu**	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**	**Hf**	**Ta**	**Th**	**U**
70PL09																						
<20% discordant																						
70P_L09 S 1	282	26.1	1647	3.98	0.41	11.34	0.72	10.89	15.42	2.78	68.3	17.80	186.03	59.31	231.9	49.4	449	62.9	8818	0.99	133.5	102.7
70P_L09 S 4	599	12.3	1560	1.40	0.09	3.07	0.13	1.28	3.76	0.32	24.5	11.16	143.90	59.32	258.1	59.2	582	89.3	11290	0.61	51.8	265.6
70P_L09 S 6	627	9.3	1652	1.66	0.04	6.43	0.04	0.62	3.26	0.35	23.0	10.39	142.99	59.74	277.2	68.7	704	109.5	11946	1.19	57.3	197.8
70P_L09 S 7																						
70P_L09 S 9	267	8.0	800	3.51	0.02	15.26		1.13	3.21	1.02	16.5	6.62	70.17	25.34	115.7	26.5	259	40.9	11585	1.24	85.5	161.4
70P_L09 S 10	155	6.0	1083	33.21	0.59	43.89	0.39	2.43	4.71	1.30	17.7	7.22	87.71	34.17	160.7	40.4	407	66.8	10597	13.29	286.7	377.9
70P_L09 S 11	298	82.5	3935	16.07	1.02	22.15	0.82	13.22	25.35	4.97	131.7	40.24	463.05	152.49	602.6	118.4	984	140.1	6888	6.26	84.2	117.7
70P_L09 S 15																						

70P_L09 S 16	144	4.7	1294	26.38		19.21	0.08	2.18	6.15	0.30	31.1	10.31	134.12	48.07	199.0	42.5	393	51.5	9404	9.43	139.3	328.1
70P_L09 S 18	552	16.7	1930	1.36	0.13	8.41	0.30	5.44	11.34	1.64	58.0	17.82	207.53	71.85	301.4	65.9	656	91.5	10795	0.63	147.9	186.6
70P_L09 S 19	316	19.4	1052	1.96	0.03	30.35	0.12	2.66	4.90	1.61	24.4	7.71	104.76	37.67	169.5	38.6	419	60.3	9432	0.62	45.7	69.8
70P_L09 S 20	135	4.0	520	0.33	0.00	3.79	0.15	2.83	3.12	1.38	12.9	3.91	45.31	16.80	73.9	20.5	237	35.7	7690	0.40	89.3	209.0
70P_L09 S 21	288	8.8	991	1.96	2.21	37.06	1.78	10.29	7.70	2.17	24.8	7.30	89.78	35.93	166.0	42.9	494	76.8	11557	1.15	109.9	180.2
70P_L09 S 22	626	10.5	1396	4.66	0.06	13.35	0.07	1.08	3.35	1.08	22.3	9.04	121.94	50.33	252.5	66.5	766	106.7	10965	1.65	27.0	116.5
70P_L09 S 23	225	8.4	695	0.85	0.03	7.91		0.53	2.48	0.75	15.7	5.44	65.26	25.55	109.7	29.4	301	41.6	9210	0.54	46.3	126.4
70P_L09 S 24	962	15.5	2349	2.61	0.88	21.17	1.30	8.69	14.67	3.90	64.0	20.40	247.28	87.64	376.7	89.5	920	124.6	10080	1.16	102.6	202.6
70P_L09 S 25	390	19.1	905	0.79		4.60	0.02	1.13	2.82	0.14	18.6	6.53	79.75	29.95	133.5	32.2	322	43.5	10056	0.59	50.0	121.3
70P_L09 S 26	217	10.7	909	7.92	0.02	8.68	0.08	0.50	3.17	0.31	20.1	7.41	93.54	32.73	145.2	34.8	353	45.7	9550	4.50	60.6	86.0
70P_L09 S 27	543	14.8	1416	1.66	0.15	7.03	0.37	2.75	6.18	1.15	31.0	11.33	140.79	51.56	222.6	48.9	483	71.2	10005	0.69	69.7	159.8
70P_L09 S 28	878	13.4	2021	1.88		11.36	0.11	3.30	8.75	2.13	49.9	17.94	207.11	75.89	323.0	78.6	803	105.7	9904	0.85	74.8	181.0
70P_L09 S 30																						
70P_L09 S 31	207	11.6	1156	3.35		7.17	0.20	3.73	5.84	0.84	32.3	10.44	121.77	42.48	175.6	39.4	394	51.2	8514	1.52	91.3	180.2
70P_L09 S 32	212	36.2	2620	33.70	0.82	41.85	1.61	24.70	37.75	2.44	123.0	34.94	346.14	108.29	397.1	87.5	809	96.5	7265	10.80	532.8	513.5
70P_L09 S 35	245	10.8	606	0.74		5.23	0.03	0.54	2.66	0.29	14.0	5.02	62.37	22.82	96.5	20.9	230	29.1	9312	0.51	76.3	257.0
70P_L09 S 36	616	12.8	1394	0.78		2.13	0.03	0.75	2.64	0.19	22.9	10.20	130.22	48.47	223.0	53.3	569	72.0	10660	0.39	30.0	176.0
70P_L09 S 37	333	16.3	985	1.97		3.99	0.11	2.17	5.81	0.51	29.2	10.15	109.74	34.43	141.6	34.4	323	40.6	9271	1.13	54.0	173.7
70P_L09 S 38	722	14.8	2007	5.29	0.19	10.16	0.20	3.05	6.20	2.41	40.6	15.90	196.71	68.54	303.1	74.3	789	100.9	10747	1.90	107.6	250.5
70P_L09 S 39	623	11.7	1283	1.53		5.16	0.04	0.72	2.03	0.40	17.7	8.27	112.75	45.21	209.9	55.2	583	81.2	10206	1.04	43.5	200.9
70P_L09 S 40	191	9.9	663	6.93	0.72	8.64	0.42	3.12	4.56	1.01	18.3	5.32	69.07	24.00	101.4	23.1	242	33.2	7392	3.88	66.9	127.8
70P_L09 S 41	718	14.3	1770	1.35	0.62	62.78	1.45	12.09	15.69	4.70	78.1	22.71	222.97	63.15	242.6	56.7	518	64.1	9101	0.86	168.1	336.1
70P_L09 S 42	634	15.7	1771	7.20	0.70	16.00	1.34	9.94	12.44	4.33	42.7	14.78	174.13	63.21	269.5	62.7	621	85.9	10442	2.75	148.1	321.7
70P_L09 S 43	287	4.1	1202	33.79		17.53	0.11	3.61	5.61	0.58	32.6	9.74	133.20	47.45	200.5	46.8	503	60.2	10697	13.88	131.7	464.3
70P_L09 S 44	154	10.9	469	0.53		11.61	0.05	0.64	2.73	0.17	13.1	4.03	50.69	16.46	62.6	14.0	132	16.3	10541	0.30	171.6	183.6
70P_L09 S 45	237	14.7	789	4.54	0.06	34.70	0.10	2.08	3.73	0.63	17.9	5.87	72.65	28.48	124.1	33.8	364	49.4	8917	1.66	102.5	130.2
70P_L09 S 46	361	15.1	1489	3.80	4.60	102.71	5.80	37.04	27.70	10.84	66.6	17.77	178.29	57.01	226.4	52.9	545	69.9	9276	1.64	280.6	284.3
70P_L09 S 47	429	19.7	1150	1.92	0.05	7.51	0.10	1.78	4.63	0.92	23.0	10.12	116.08	42.49	172.1	43.6	464	59.0	9617	0.74	61.0	125.4
70P_L09 S 48																						
70P_L09 S 49	676	13.3	1587	1.43	0.03	7.58	0.03	0.88	3.98	0.35	28.0	10.01	137.65	56.85	248.6	62.8	684	87.2	9660	0.94	59.0	183.5
70P_L09 S 50	269	2.3	1123	3.38		17.80	0.26	4.85	6.75	1.86	30.6	9.50	109.47	39.16	163.8	41.9	397	51.6	7723	1.77	91.6	152.6

70P_L09 S 51	155	7.5	529	3.03		6.04	0.03	0.69	2.12	0.20	9.7	3.64	49.19	17.48	86.1	20.3	218	25.9	7598	1.69	50.7	145.7
70P_L09 S 52																						
70P_L09 S 53	259	23.4	2025	9.14	0.24	29.35	0.77	15.94	26.07	7.75	96.8	26.47	276.28	81.82	299.9	63.4	646	75.1	5890	3.39	171.6	197.2
70P_L09 S 56	156	5.3	1005	0.37		3.30	0.05	2.51	4.32	1.48	21.7	7.80	86.18	31.54	140.4	35.2	396	53.0	7068	0.12	33.9	82.3
70P_L09 S 60	111	4.2	845	43.68	0.12	19.07	0.16	2.20	4.52	0.50	24.0	6.96	90.04	29.85	129.7	31.3	309	33.5	7532	14.31	153.3	448.1
70P_L09 S 61	176	6.5	426	2.76		4.91	0.02	0.29	1.44	0.12	7.8	3.08	38.72	14.33	69.8	16.4	192	22.9	8067	1.57	40.3	127.7
70P_L09 S 63	218	8.7	847	3.51	5.69	43.51	5.13	30.85	14.55	3.50	30.1	8.90	95.40	29.57	128.8	34.7	365	40.9	7720	1.62	94.4	313.0
70P_L09 S 65	384	13.7	788	0.86		4.96		1.22	2.47	0.34	15.7	6.20	72.55	29.17	134.7	33.1	342	38.4	8656	0.79	54.5	182.1
70P_L09 S 66	200	6.5	652	1.24		3.85	0.05	0.68	1.94	0.50	15.5	5.43	67.19	25.39	113.4	28.3	312	34.6	7119	0.66	42.1	131.7
70P_L09 S 67	400	9.7	1206	4.45	0.45	17.80	1.24	7.25	6.67	1.87	28.6	9.75	123.58	43.51	192.7	47.7	465	56.5	9644	2.21	81.1	201.9
70P_L09 S 69	108	7.3	2281	40.44	0.29	20.25	0.38	5.37	12.90	0.76	56.7	20.86	213.66	79.81	343.0	75.5	703	74.3	7754	15.46	352.9	845.3
70P_L09 S 70	118	6.1	1181	74.61		27.87	0.14	1.98	5.82	0.35	26.5	10.61	124.87	45.31	173.8	39.8	432	43.9	7580	18.82	284.1	783.7
70P_L09 S 72	382	4.3	1113	28.83	0.07	15.65	0.22	4.30	8.98	1.26	42.3	14.08	148.23	47.25	195.7	43.2	414	49.4	7666	9.20	115.1	309.8
70P_L09 S 74	150	10.1	297	0.98		13.04		0.95	2.15	0.71	7.0	2.67	29.81	9.29	36.9	10.6	122	15.0	6125	0.48	28.9	100.4
70P_L09 S 75	224	41.4	908	12.81	1.77	20.71	2.58	15.96	11.92	4.23	34.3	9.00	93.94	28.78	124.6	30.1	287	34.5	6080	4.38	201.1	422.0
70P_L09 S 76	107	7.9	374	0.49		7.53	0.02	0.86	1.62	0.42	9.0	3.17	35.47	12.93	59.1	16.1	164	21.5	7201	0.40	30.6	103.8
70P_L09 S 77	162	5.7	457	4.17		27.81	0.05	0.91	3.12	0.95	11.9	4.46	47.28	15.72	68.1	16.7	165	19.4	7416	2.45	65.4	453.1
70P_L09 S 78	527	9.5	1297	4.76	0.02	9.20	0.14	2.33	4.74	1.42	29.0	9.91	125.42	46.77	206.4	49.3	504	66.9	8981	0.84	69.6	199.0
70P_L09 S 79	732	10.2	1576	3.32	0.03	10.86	0.08	1.89	7.25	1.33	33.9	12.09	159.02	59.87	245.4	66.8	728	82.3	8875	1.38	79.6	266.3
70P_L09 L 311	101	4.8	208	0.21		1.54	0.01		0.14	0.24	3.6	1.21	15.82	7.14	36.1	9.8	127	21.6	7238	0.11	31.5	128.3
70P_L09 L 312	103	5.5	394	0.08		1.99	0.01	0.97	2.09	0.72	9.6	3.07	35.45	14.75	63.3	17.1	192	28.1	7300	0.05	52.9	140.9
70P_L09 L 314																						
70P_L09 L 315																						
70P_L09 L 317	187	3.9	712	1.60		8.79	0.02	0.40	2.68	0.25	16.1	5.27	63.97	26.29	112.1	26.7	260	37.5	9503	0.53	36.9	112.5
70P_L09 L 318																						
70P_L09 L 319	268	13.3	650	2.49		32.53	0.06	0.49	2.98	0.17	15.8	5.07	65.86	24.32	107.8	25.5	256	38.2	10390	1.18	83.5	128.7
70P_L09 L 320	393	26.8	1475	1.00	1.34	28.18	0.95	9.90	13.63	3.66	58.4	16.75	175.06	58.17	233.3	47.9	446	61.3	8251	0.71	103.3	88.0
70P_L09 L 321	186	11.2	445	1.08		26.25	0.04	1.30	2.54	1.17	15.0	4.22	42.43	12.67	58.7	13.7	151	24.3	9887	0.53	98.9	160.6
70P_L09 L 322	204	9.6	545	1.48		27.77	0.13	3.24	5.45	1.64	22.6	5.97	59.85	16.85	75.4	16.7	174	26.9	9048	0.70	118.5	160.3
70P_L09 L 323	175	12.4	503	1.90		27.85	0.07	1.62	3.83	1.18	17.6	5.19	45.80	16.76	71.2	16.0	161	25.3	9777	1.13	149.1	196.0
70P_L09 L 324	663	9.2	1863	1.28		5.32	0.05	1.64	4.97	0.21	35.4	13.74	166.41	66.74	312.4	70.0	666	103.3	12804	0.92	119.0	358.1
70P_L09 L 325	430	18.1	1079	0.74	0.04	4.86	0.06	1.07	3.20	0.34	21.8	7.78	98.86	38.41	166.1	37.8	371	58.7	11552	0.58	63.4	134.4

70P_L09 L 326	132	11.0	478	3.05		6.48	0.01	0.79	2.19	0.08	8.3	3.69	46.95	18.04	75.2	17.4	183	29.5	10614	1.02	30.9	111.0
70P_L09 L 327	220	53.9	724	2.93		6.46	0.09	1.38	3.45	0.15	17.4	6.14	75.04	25.93	112.1	25.7	261	42.1	9866	0.68	41.3	113.2
70P_L09 L 328	155	8.6	573	2.95		14.06	0.07	1.22	2.50	0.32	14.6	5.07	52.59	19.53	87.0	20.0	186	30.7	11546	1.39	155.1	173.9
70P_L09 L 329	184	12.8	521	2.03		12.09	0.12	0.79	2.46	0.08	11.2	4.16	47.12	17.07	75.5	17.2	167	26.1	11662	0.80	89.4	95.3
70P_L09 S 83	178	9.2	875	0.04		5.96	0.24	2.70	6.59	0.70	25.8	8.41	91.05	30.04	130.7	27.8	296	34.7	6724	0.19	39.9	52.9
70P_L09 S 84	119	1.2	223	0.04		2.59	0.07	0.68	1.30	0.33	5.2	1.30	23.08	8.44	37.3	8.6	105	15.9	10054	0.41	22.8	93.2
70P_L09 S 86	105	5.9	1104	25.91		17.36	0.10	4.27	7.74	0.07	37.4	11.37	130.04	42.73	163.1	38.3	360	38.8	6219	7.74	152.6	313.0
70P_L09 S 88	328	3.4	1650	29.70		22.00	0.09	3.13	8.81	1.21	42.0	14.61	173.54	60.07	265.1	63.1	629	82.3	8689	11.41	220.2	553.1
70P_L09 S 90	313	8.3	1070	4.64		19.69		2.79	3.19	0.80	22.3	8.00	105.84	40.25	169.1	39.3	379	50.3	8191	1.83	90.4	173.9
70P_L09 S 91																						
70P_L09 S 92																						
70P_L09 S 93	149	8.4	517	1.35	1.24	15.86	0.50	3.20	4.62	0.92	16.5	5.01	51.63	18.17	79.6	19.2	198	28.5	7052	0.73	79.5	271.7
70P_L09 S 94	130	9.4	3272	27.30		22.10	0.56	10.91	20.71	0.66	118.5	38.41	412.39	137.95	491.6	108.6	962	109.8	5630	6.57	356.7	791.9
70P_L09 S 95	774	27.0	2150	3.97	0.39	12.31	0.63	6.89	14.62	7.02	80.4	21.67	215.76	73.90	276.2	66.4	651	82.1	8955	1.74	105.5	174.7
70P_L09 S 97																						
70P_L09 S 98	288	944.4	1442	14.00	0.10	8.53	0.37	4.96	8.00	0.83	34.8	12.16	140.48	53.10	211.3	49.9	448	67.2	8436	2.20	156.8	259.7
70P_L09 S 100	328	16.4	916	1.14		5.08		1.11	1.96	0.32	18.3	5.58	81.65	31.69	147.4	31.5	333	53.1	10295	0.47	36.4	75.3
70P_L09 S 102	54	16.5	695	19.37	0.95	35.22	0.25	1.38	0.08	0.59	12.7	4.39	59.14	21.85	107.3	26.4	282	44.9	9213	7.27	148.3	228.5
70P_L09 S 3																						
70P_L09 S 6	197	12.7	650	8.91		26.27	0.04	1.37	3.46	0.60	17.4	6.28	71.38	24.38	103.2	23.5	243	33.9	9062	3.91	53.0	67.4
70P_L09 S 11	322	3.4	3132	31.46	0.19	18.97	0.25	5.43	14.58	1.52	84.9	28.77	339.67	119.80	489.3	103.5	992	130.0	11036	13.09	312.8	612.6
70P_L09 S 12	255	21.8	640	3.27	0.10	11.35	0.11	1.82	5.31	2.02	19.7	7.12	72.14	23.49	95.6	22.0	211	28.0	8144	1.61	26.7	35.3
70P_L09 S 18																						
70P_L09 S 20																						
70P_L09 S 21	891	11.2	2002	4.34	0.16	8.16	0.19	2.70	6.28	1.27	35.3	15.18	193.32	75.79	338.8	88.1	955	111.9	8936	1.89	98.2	264.4
70P_L09 S 22																						
70P_L09 S 24																						
70P_L09 S 25																						
70P_L09 S 26																						
70P_L09 S 32																						

70P_L09 S 36																						
>20% discordant																						
70P_L09 S 29	699	23.8	1684	9.03	25.64	86.77	10.00	55.96	37.60	15.94	120.1	32.19	239.80	60.37	194.0	39.5	393	45.7	10666	3.46	143.2	484.9
70P_L09 S 16	234	50.5	573	9.49	22.25	53.98	4.54	20.52	4.54	1.47	17.4	5.28	64.17	20.73	87.5	21.6	217	27.0	8359	3.50	41.8	63.7
70P_L09 S 13																						
70P_L09 S 31																						
70P_L09 S 35	267	7.4	922	20.50	0.10	13.67	0.11	1.93	4.16	0.43	24.6	8.78	95.54	35.27	147.5	35.9	350	38.8	6009	7.67	74.8	243.5
70P_L09 S 8																						

Analysis	**P**	**Ti**	**Y**	**Nb**	**La**	**Ce**	**Pr**	**Nd**	**Sm**	**Eu**	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**	**Hf**	**Ta**	**Th**	**U**
Scout 2																						
<20% discordant																						
Scout2 S 335	130	1.7	2811	18.39	1.00	22.00	0.74	9.91	19.15	2.19	102.8	31.35	352.07	116.67	433.8	86.0	792	93.1	6160	6.24	249.9	366.6
Scout2 S 336	104	3.4	1228	17.21		21.20	0.28	4.66	8.59	1.12	44.4	13.19	143.78	49.49	187.1	39.1	352	44.1	5675	5.98	126.4	204.5
Scout2 S 337																						
Scout2 S 338	182	13.3	2469	9.24	0.41	18.82	0.96	12.95	15.24	3.33	73.1	21.60	249.27	94.31	382.5	79.4	718	85.8	6705	6.21	423.0	440.6
Scout2 S 342	123	4.1	827	14.77		18.72	0.18	3.68	6.27	0.66	30.1	9.85	100.86	33.26	126.6	29.0	265	31.3	5248	4.95	79.4	149.9
Scout2 S 344	114	3.5	963	24.38		27.48	0.16	3.11	6.58	0.84	33.4	11.02	127.81	43.43	161.6	35.8	353	39.4	5543	7.22	143.2	236.4
Scout2 S 349	155	3.7	1789	61.89		40.22	0.12	3.14	7.65	0.87	52.9	18.15	199.18	67.39	285.3	62.5	566	59.6	6880	21.36	517.2	1078.4
Scout2 S 351	135	2.2	2898	27.07	0.14	29.38	0.50	8.23	21.65	4.99	98.9	30.35	348.81	116.01	457.5	96.0	870	95.7	7956	14.39	354.0	582.1
Scout2 S 352	66	0.5	300	14.96		11.01		0.19	1.37	0.34	6.9	2.57	33.72	12.00	46.8	11.9	127	13.4	7385	8.68	45.7	163.6
Scout2 S 354	288	15.2	1148	5.46	0.40	20.87	0.46	8.50	12.65	2.22	37.1	12.16	136.56	44.68	177.4	39.9	415	52.6	6064	5.96	390.2	437.6
Scout2 S 357	107	5.5	853	16.09	0.48	18.66	0.16	3.04	5.43	0.63	29.5	9.71	103.24	32.48	126.6	27.3	275	30.1	5216	5.50	76.9	163.9
Scout2 S 358	105	4.8	950	12.23		12.90	0.21	4.96	7.49	0.74	32.8	10.48	121.20	37.76	141.4	30.1	308	32.6	5065	4.26	64.2	138.2
Scout2 S 359																						
Scout2 S 361																						
Scout2 S 363	182	11.7	956	3.47		18.11	0.27	3.13	7.56	1.73	31.6	9.54	112.08	37.93	138.0	30.7	310	36.0	7073	2.09	87.6	138.1
Scout2 S 364																						
Scout2 S 365	200	7.3	697	12.88	5.33	31.59	2.59	14.78	6.18	0.52	21.0	7.05	78.20	25.92	104.1	21.6	225	26.4	6098	4.53	76.5	152.8
Scout2 S 368																						
Scout2 S 375	143		1393	23.92	11.13	56.75	2.68	14.67	12.88	0.92	47.9	16.17	174.36	58.26	210.6	45.9	456	45.5	4849	7.64	101.6	232.0

Scout2 S 3761612.6 939 13.92 0.06 16.35 0.21 3.28 6.86 0.62 36.1 10.72 114.45 38.55 144.231.0 284 31.65376 4.61 68.0 151.0
Scout 2 L 1220 11.0 629 7.50 17.27 0.09 2.19 4.35 0.99 20.7 6.75 77.17 24.17 104.325.5 285 27.78236 5.13 76.7 133.7
Scout 2 L 2182 7.7 647 10.21 0.04 16.74 0.10 1.45 4.09 0.64 21.8 6.69 82.07 26.59 103.728.1 307 29.79041 7.46 82.6 161.1
Scout 2 L 4140 5.3 794 15.40 0.63 16.25 0.24 3.15 6.75 0.56 26.7 8.61 100.05 32.03 121.228.6 293 28.16231 6.35 67.7 140.4

>20% discordant

Scout2 S 334
Scout2 S 34611221.5117423.37 3.11 21.54 1.25 12.64 12.88 1.57 48.8 13.61 154.66 46.17 174.940.4 421 49.47097 10.18 423.1 556.1
Scout2 S 347157188.94035137.771.7442.98 0.98 9.13 24.31 2.44 115.742.83 497.15 162.18 596.4127.81214 128.76172 27.12 738.9 1473.8
Scout2 S 3501419.4 3149 51.52 0.89 30.52 0.45 5.77 16.25 1.78 92.8 30.90 351.53 126.73 478.5100.4 957 103.17349 13.73 502.7 1002.8
Scout2 S 3561585.9 1604 22.43 0.97 32.59 0.75 8.60 15.20 0.91 61.1 18.38 198.68 65.91 253.554.3 502 63.55758 6.46 214.6 278.3
Scout2 S 3671962.7 724 13.81 17.20 0.07 3.37 5.65 0.68 27.5 7.30 88.95 27.87 106.323.0 234 26.05745 4.78 78.5 149.7
Scout2 S 3701845.0 1471 7.49 0.16 20.48 1.30 18.09 21.46 1.14 70.6 19.91 195.44 58.95 213.545.8 445 54.46096 3.45 115.7 146.8
Scout2 S 3723137.2 2446 39.04 0.17 23.75 0.04 4.19 9.70 0.86 60.1 21.60 275.80 94.84 380.181.6 815 88.67597 14.53 604.8 1336.7
Scout2 S 3731901.7 3158135.450.23 57.09 0.36 4.46 13.85 1.10 77.9 29.70 354.45 121.55 469.3102.7 976 106.07362 37.06 936.4 2229.3
Scout2 S 3781237.2 759 11.38 16.65 0.07 2.63 4.90 0.59 24.6 7.82 86.64 28.24 113.524.2 235 24.85441 4.68 64.2 140.7
Scout 2 L 3159 5.7 1758 7.83 0.03 18.12 0.71 13.74 24.20 2.59 87.3 24.02 252.03 76.24 268.662.3 595 55.56328 3.56 108.1 161.0
Scout 2 L 5

Analysis P Ti Y Nb La Ce Pr Nd Sm Eu Gd Tb Dy Ho Er Tm Yb Lu Hf Ta Th U

Scout 3

<20% discordnat

Scout3 S 3801175.3 683 10.59 0.20 15.46 0.11 2.29 5.56 0.41 21.6 7.18 79.01 28.05 103.723.7 219 27.46379 4.01 60.8 114.8
Scout3 S 3831053.8 1587 9.57 0.36 17.41 0.37 10.80 15.92 1.36 75.7 20.28 218.48 66.51 249.353.4 461 51.35619 3.09 95.5 163.9
Scout3 S 3841146.1 822 12.60 0.09 19.55 0.04 3.06 6.04 0.56 30.2 9.20 107.87 32.46 123.327.2 265 32.46192 4.71 93.7 154.2
Scout3 S 386
Scout3 S 387
Scout3 S 3889319.7 429 7.29 8.62 0.29 3.49 4.74 1.26 16.4 5.03 51.09 19.10 70.815.9 168 20.75946 3.65 70.0 122.3
Scout3 S 3891437.1 791 14.20 1.40 21.87 0.32 4.65 8.37 0.70 30.8 9.09 95.36 30.80 115.724.8 255 28.65474 4.66 79.7 142.0
Scout3 S 3901286.2 1199 25.11 3.02 25.69 0.98 7.21 9.17 0.91 38.1 12.78 144.68 50.31 186.838.8 374 44.55798 7.40 92.6 198.6
Scout3 S 3911136.3 639 11.31 0.02 15.57 0.02 1.40 5.57 0.32 21.7 6.80 76.31 24.33 95.622.1 212 26.66311 3.84 58.3 119.7
Scout3 S 3921384.6 858 13.71 18.98 0.06 2.24 6.11 0.72 27.2 8.88 93.34 33.41 124.528.2 251 29.26109 5.51 93.4 171.9

Scout3 S 3931025.7	839	10.04	0.09	14.76	0.27	3.83	6.78	0.63	31.5	9.87	102.86	32.83	129.028.1	281	31.76040	3.88	63.2	125.6
Scout3 S 3941287.1	826	16.06		19.32	0.07	3.39	5.32	0.78	29.2	9.44	95.68	32.47	132.831.1	290	31.86531	6.24	96.1	180.9
Scout3 S 3962038.5	674	8.23	1.85	24.00	0.52	6.18	7.04	0.69	25.0	7.04	76.74	24.89	105.525.0	243	27.86549	4.70	112.6	183.0
Scout3 S 39715010.6	650	9.93	0.12	17.19	0.19	3.39	4.91	0.23	22.9	6.72	80.33	26.88	106.623.3	244	32.07007	4.14	79.5	148.6
Scout3 S 3981307.6	946	8.95	0.03	15.71	0.43	7.39	11.15	0.56	37.2	11.82	125.70	38.80	138.731.6	324	36.95821	4.27	74.5	123.3
Scout3 S 4001594.7	663	11.79	1.99	22.64	1.01	5.96	7.11	0.25	24.4	7.12	80.28	26.23	103.324.2	226	26.17463	4.57	61.8	127.2
Scout3 S 402																		
Scout3 S 4031426.4	616	11.73		15.89	0.10	1.65	4.82	0.55	22.3	6.89	76.25	24.21	100.620.9	229	25.36449	4.30	62.4	134.4
Scout3 S 40598 1.7	831	11.40		17.80	0.09	4.33	6.32	0.90	31.2	9.51	99.50	32.02	133.328.1	263	29.55921	4.90	66.0	134.7
Scout3 S 4061664.9	998	20.10		21.41	0.09	3.08	8.26	0.71	37.4	11.35	119.21	39.07	153.236.0	331	38.15502	6.59	114.9	206.3
Scout3 S 4081437.6	679	13.05		18.02	0.19	4.33	6.02	0.65	22.6	7.54	84.08	26.75	101.823.5	239	28.56701	4.61	83.4	147.1
Scout3 S 4101636.6	763	12.09	0.08	13.98	0.26	2.51	5.58	0.53	28.6	8.28	95.07	30.53	116.125.2	260	29.66503	5.04	55.6	114.4
Scout3 S 411																		
Scout3 S 413																		
Scout3 S 414																		
Scout3 S 4151548.6	850	14.71	0.03	13.80	0.18	3.65	7.70	0.86	32.2	9.42	101.96	35.31	128.130.1	291	34.26520	7.15	56.5	137.0
Scout3 S 41811513.9	1162	12.33	0.17	12.78	0.88	12.11	16.27	3.17	52.1	14.53	167.58	49.82	187.342.3	409	47.85918	3.95	124.9	206.6
Scout3 S 419																		
Scout3 S 4211986.8	1201	15.72		20.86	0.57	6.83	12.06	0.92	47.8	14.53	141.08	47.73	182.239.8	386	46.66534	4.89	126.2	200.4
Scout3 S 4221874.5	1387	10.96	2.14	22.54	1.20	9.33	13.08	1.01	48.9	17.06	177.45	57.68	204.543.1	391	45.05543	4.29	95.4	175.1
Scout3 S 4231846.6	1720	11.61	0.46	19.96	0.86	14.52	18.89	1.38	68.4	21.55	211.23	66.21	252.452.4	519	58.56225	3.52	136.4	198.4
Scout3 S 424																		
Scout3 S 425																		
Scout3 S 426																		
Scout3 S 4271945.5	1262	13.62	0.01	18.02	0.33	8.49	12.26	0.82	50.3	13.81	155.87	49.43	183.439.7	370	43.85923	4.48	92.9	168.7
Scout3 S 4281476.3	835	15.85	0.06	18.71	0.09	3.43	4.81	0.67	24.0	7.42	95.00	31.11	124.826.2	265	32.25819	5.12	87.9	174.1
Scout3 S 432																		
Scout3 S 4331657.0	1910	29.86	0.05	31.76	0.67	8.00	15.00	1.23	75.7	21.63	241.63	76.57	286.958.6	531	58.95091	7.91	228.3	339.1
Scout3 S 4361688.4	710	12.80		16.24	0.08	3.26	7.04	0.48	24.1	7.66	79.36	26.83	110.622.4	227	28.56077	4.62	69.4	138.3
Scout3 S 4381388.8	976	6.21	0.63	13.53	0.33	6.45	10.55	0.83	42.1	11.49	127.45	37.36	144.230.0	287	34.55561	2.47	56.4	110.5
Scout3 S 44221511.3	1169	14.14		29.29	0.61	7.30	10.59	0.79	44.6	15.04	140.14	45.48	176.838.8	373	45.76321	5.52	238.6	327.0
Scout3 S 4432083.9	885	20.38	21.93	64.50	6.60	30.23	12.20	0.77	36.4	10.60	106.82	35.15	133.028.9	292	33.56203	6.59	105.5	182.8

Scout3 S 4451348.6	948	10.13	0.53	17.57	0.08	5.34	9.87	0.57	33.1	11.06	122.22	36.27	144.230.9	281	34.65705	3.40	68.6	116.8
Scout 3 L 151274.4	862	17.39	0.06	18.86	0.10	2.96	5.92	0.81	32.6	10.66	118.81	36.82	138.933.9	331	29.65893	6.58	93.4	181.8
Scout 3 L 161878.6	1317	9.80	0.90	21.16	1.15	16.93	21.33	1.55	70.0	18.81	188.66	55.93	199.948.5	506	48.37109	4.41	120.9	159.5
Scout 3 L 181794.5	3782	64.62	0.07	68.97	0.54	17.84	38.43	3.79	168.2	55.24	578.79	175.76	605.9130.3	1215	106.55384	16.21	463.7	564.9
Scout 3 L 20																		
Scout 3 L 2117016.7	486	6.25		12.82	0.10	1.69	4.68	0.34	19.7	5.06	57.46	19.70	76.018.1	217	23.18328	3.28	52.6	92.8
Scout 3 L 22																		
Scout 3 L 231717.1	830	16.51		18.82	0.14	3.73	6.67	0.73	32.5	9.44	109.66	35.44	137.030.9	336	32.07426	6.76	93.2	165.6
Scout 3 L 252347.5	1452	34.20	3.62	46.14	1.15	10.24	12.42	1.17	51.0	16.91	190.26	59.81	228.652.4	533	51.88565	14.62	375.3	459.4
Scout 3 L 26																		
Scout 3 L 291366.9	1033	39.91	0.10	14.40	0.27	3.48	9.48	0.36	37.1	13.09	143.26	44.86	169.942.4	420	40.46435	12.45	127.5	257.5
Scout 3 L 302628.6	3517	137.24	0.06	91.93	0.78	13.37	31.94	1.20	143.5	46.63	493.35	153.19	556.9121.3	1246	112.17551	36.35	674.1	911.6
Scout 3 L 311534.4	963	37.95	0.07	17.69	0.08	2.20	4.35	0.32	32.0	10.13	115.19	40.57	161.238.7	415	37.09798	15.70	151.8	392.7
Scout 3 L 332069.4	2077	17.58	0.11	24.94	0.78	13.40	23.37	2.07	96.1	28.08	291.21	88.58	315.671.4	720	70.56550	7.06	208.8	251.7
Scout 3 L 341546.3	713	14.50		15.86	0.08	2.60	5.15	0.51	26.3	8.16	90.61	27.70	105.126.1	274	26.86888	5.83	64.0	131.5
Scout 3 L 351515.8	1536	13.39	0.21	15.86	0.47	8.01	15.26	1.65	66.0	19.94	205.63	63.87	231.352.2	544	50.65858	5.59	93.8	174.4
Scout 3 L 36																		
Scout 3 L 37																		
Scout 3 L 381195.9	710	15.93		17.13	0.10	2.08	6.74	0.48	25.3	8.77	93.18	30.02	112.528.2	302	26.56587	6.58	72.2	154.6
Scout 3 L 39																		
>20% discordant																		
Scout3 S 381																		
Scout3 S 3951366.1	637	12.54		14.10	0.17	2.27	5.45	0.37	24.6	7.58	84.58	26.39	106.324.7	256	27.06260	4.23	57.1	119.8
Scout3 S 404																		
Scout3 S 4091192.4	1177	17.99		17.90	0.18	4.07	8.05	1.12	39.4	12.04	143.75	45.82	172.838.1	348	40.05234	5.35	84.6	187.9
Scout3 S 4122032.7	4518	117.73		65.59	0.62	11.46	32.55	1.91	174.5	57.96	609.02	192.00	707.1144.8	1193	128.25697	21.74	597.5	1179.0
Scout3 S 4161676.7	1831	18.17	0.45	20.83	0.60	12.41	17.88	1.48	74.7	22.53	235.10	75.22	271.059.7	538	62.26921	7.37	141.1	225.4
Scout3 S 4201687.5	1052	10.24	0.06	15.60	0.27	5.48	9.54	0.73	38.0	11.64	121.45	40.55	152.733.1	312	36.26418	3.38	78.4	137.4
Scout3 S 4351606.1	598	11.42		14.29	0.02	1.65	3.67	0.31	18.8	6.58	66.35	22.43	87.821.0	191	23.56740	4.73	43.0	95.9
Scout3 S 437																		
Scout3 S 439																		
Scout 3 L 141455.8	1728	10.81	0.16	16.63	0.49	8.93	17.86	1.84	75.2	23.27	243.73	75.19	263.958.2	589	50.85749	4.71	99.8	168.0

Scout 3 L 171738.2	728	15.46		17.89	0.16	2.15	6.53	0.41	29.8	8.61	92.00	30.64	112.6	27.5	288	27.67	176	5.89	79.9	143.5
Scout 3 L 1917613.4	365	6.32		3.66	0.02	1.24	2.84	1.73	14.5	4.44	47.60	15.71	60.3	14.5	159	16.57	835	2.58	13.2	35.4
Scout 3 L 241833.6	5314	118.44	0.02	51.63	0.36	9.24	32.30	1.46	163.6	65.55	720.73	236.41	867.5	196.9	1879	162.78	839	25.13	559.1	1200.4
Scout 3 L 2715210.1	473	10.11	0.32	13.27	0.12	1.85	2.85	0.34	18.5	4.89	55.74	18.06	76.6	20.5	198	20.98	336	4.31	40.6	78.6

APPENDIX 2D:

BSU zircon CA-IDTIMS U-Pb geochronology

	Compositional Parameters					Radiogenic Isotope Ratios									Isotopic Ages					
Sample	Th/U	$^{206}Pb^*$ x10^{-13} mol	mol % $^{206}Pb^*$	Pb^*/Pbc	Pbc (pg)	$^{206}Pb/^{204}Pb$	$^{208}Pb/^{206}Pb$	$^{207}Pb/^{206}Pb$	% err	$^{207}Pb/^{235}U$	% err	$^{206}Pb/^{238}U$	% err	corr. coef.	$^{207}Pb/^{206}Pb$	±	$^{207}Pb/^{235}U$	±	$^{206}Pb/^{238}U$	±
(a)	(b)	(c)	(c)	(c)	(c)	(d)	(e)	(e)	(f)	(e)	(f)	(e)	(f)		(g)	(f)	(g)	(f)	(g)	(f)
67PL09																				
z2a	0.470	0.1532	0.97	9	0.43	546	0.146	0.062022	0.652	0.942648	0.735	0.110230	0.172	0.572	674.88	13.95	674.27	3.62	674.083	1.098
z2b	0.428	0.0453	0.93	4	0.28	260	0.133	0.060783	2.148	0.924784	2.298	0.110346	0.504	0.398	631.57	46.26	664.89	11.21	674.755	3.230
z3	0.833	0.4220	0.99	27	0.43	1502	0.258	0.062217	0.235	0.960586	0.285	0.111976	0.084	0.698	681.58	5.01	683.60	1.42	684.213	0.542
z5	0.482	0.2862	0.97	9	0.81	547	0.149	0.061771	0.598	0.939249	0.668	0.110280	0.122	0.631	666.19	12.81	672.49	3.29	674.371	0.784
z6	0.434	0.4515	0.98	16	0.70	978	0.134	0.061941	0.333	0.944397	0.386	0.110580	0.084	0.694	672.07	7.13	675.18	1.90	676.113	0.541
z7a	0.463	0.2851	0.99	21	0.33	1301	0.144	0.062211	0.290	0.947454	0.345	0.110455	0.102	0.641	681.38	6.19	676.78	1.70	675.392	0.657
z7b	0.375	0.2091	0.99	20	0.26	1223	0.116	0.062025	0.319	0.944711	0.378	0.110467	0.120	0.617	674.97	6.81	675.34	1.87	675.458	0.767
z8	0.629	0.7757	0.99	48	0.42	2770	0.195	0.062119	0.142	0.945671	0.192	0.110412	0.070	0.804	678.20	3.04	675.85	0.95	675.140	0.450
z9	0.751	0.1309	0.94	5	0.70	296	0.233	0.062290	1.227	0.956788	1.370	0.111402	0.343	0.523	684.09	26.19	681.63	6.80	680.885	2.215

z10a	0.661	0.0649	0.93	4	0.41	254	0.205	0.063522	1.427	0.967929	1.593	0.110515	0.410	0.513	725.75	30.26	687.40	7.96	675.736 2.627
z10b	0.702	0.0686	0.90	3	0.60	189	0.218	0.061509	1.926	0.934974	2.102	0.110245	0.344	0.572	657.09	41.30	670.25	10.31	674.169 2.204
z11a	0.886	0.4190	0.97	10	1.13	572	0.274	0.062516	0.492	0.968472	0.554	0.112356	0.095	0.698	691.81	10.50	687.68	2.77	686.414 0.617
z11b	0.905	0.2821	0.99	33	0.24	1802	0.280	0.062455	0.222	0.967362	0.279	0.112336	0.104	0.682	689.74	4.74	687.10	1.40	686.297 0.675
z12	1.100	0.0373	0.89	3	0.39	160	0.341	0.062964	2.970	0.970842	3.165	0.111829	0.609	0.406	707.01	63.18	688.90	15.83	683.363 3.950

69PL09

z2	0.777	0.1016	0.94	5	0.54	300	0.240	0.062083	1.314	0.986161	1.434	0.115205	0.300	0.486	676.98	28.09	696.76	7.23	702.908 2.000
z3	0.719	0.0932	0.95	6	0.43	341	0.222	0.062241	1.139	0.987496	1.246	0.115069	0.280	0.477	682.40	24.32	697.44	6.28	702.117 1.865
z5	0.843	0.1641	0.98	20	0.22	1117	0.261	0.062738	0.314	1.000259	0.382	0.115633	0.147	0.613	699.36	6.68	703.94	1.94	705.377 0.983
z6	0.790	0.0655	0.96	9	0.21	495	0.244	0.062568	0.961	0.995859	1.069	0.115437	0.319	0.470	693.57	20.49	701.71	5.42	704.249 2.126
z7	0.827	0.2551	0.99	26	0.27	1457	0.256	0.062622	0.276	0.997809	0.348	0.115564	0.154	0.640	695.41	5.88	702.70	1.76	704.979 1.028
z8	0.768	1.3898	0.97	9	4.05	527	0.238	0.063604	1.511	1.014863	1.607	0.115724	0.230	0.474	728.47	32.04	711.33	8.22	705.907 1.537
z9a	1.005	1.6599	1.00	200	0.24	10557	0.311	0.062840	0.081	1.000831	0.138	0.115511	0.067	0.925	702.82	1.71	704.23	0.70	704.676 0.445
z9b	1.040	0.5086	0.99	64	0.23	3348	0.322	0.062892	0.144	0.998587	0.196	0.115157	0.078	0.772	704.57	3.07	703.09	0.99	702.631 0.522
z10a	1.014	0.3341	0.99	37	0.26	1954	0.314	0.062717	0.210	0.999111	0.263	0.115539	0.092	0.695	698.64	4.47	703.36	1.33	704.835 0.611

z10b	0.994	0.3855	0.99	25	0.43	1346	0.308	0.062515	0.268	0.995519	0.316	0.115495	0.089	0.642	691.79	5.71	701.53	1.60	704.579	0.594
z11	0.646	0.1849	0.99	23	0.21	1358	0.200	0.062774	0.309	1.000319	0.369	0.115573	0.128	0.607	700.60	6.58	703.97	1.88	705.030	0.857
z12a	0.561	0.0572	0.96	7	0.20	447	0.174	0.062011	1.079	0.977679	1.205	0.114347	0.395	0.465	674.49	23.08	692.41	6.05	697.947	2.616
z12b	0.597	0.3221	0.99	27	0.31	1594	0.185	0.062515	0.193	0.983860	0.259	0.114142	0.086	0.828	691.79	4.13	695.58	1.30	696.758	0.571
z13	0.771	0.7600	1.00	79	0.26	4447	0.239	0.062766	0.115	0.999478	0.168	0.115490	0.073	0.829	700.32	2.45	703.54	0.85	704.554	0.489
z14	0.700	0.6542	1.00	79	0.22	4516	0.217	0.062866	0.107	1.001911	0.162	0.115587	0.073	0.853	703.71	2.28	704.78	0.83	705.114	0.489
z15a	0.824	2.4711	1.00	288	0.23	15892	0.255	0.062930	0.069	1.002169	0.129	0.115499	0.065	0.962	705.88	1.47	704.91	0.66	704.607	0.432
z15b	0.753	1.0824	1.00	107	0.27	5986	0.233	0.062918	0.100	1.000841	0.154	0.115368	0.069	0.873	705.47	2.13	704.24	0.78	703.850	0.457
70PL09																				
z2	0.280	0.0411	0.92	3	0.28	239	0.087	0.061088	2.194	0.928228	2.348	0.110205	0.486	0.410	642.32	47.16	666.70	11.48	673.936	3.110
z3	0.279	0.0472	0.93	4	0.27	277	0.086	0.062399	1.875	0.978057	2.037	0.113680	0.445	0.459	687.83	40.00	692.61	10.23	694.082	2.929
z4	0.590	0.0946	0.96	8	0.32	459	0.183	0.062297	0.917	0.961729	1.025	0.111966	0.272	0.509	684.31	19.57	684.19	5.10	684.155	1.767
z5	0.755	0.0479	0.93	5	0.28	275	0.234	0.062935	1.712	1.004528	1.866	0.115763	0.460	0.444	706.03	36.42	706.11	9.49	706.130	3.075
z6	0.435	0.0804	0.95	6	0.36	353	0.135	0.062734	1.026	0.997737	1.140	0.115348	0.266	0.522	699.23	21.86	702.66	5.78	703.733	1.771
z7	0.465	0.2511	0.98	19	0.34	1134	0.144	0.062008	0.309	0.944093	0.365	0.110424	0.104	0.638	674.39	6.62	675.02	1.80	675.211	0.668

z8	0.516	1.4926	1.00	135	0.28	8016	0.160	0.062062	0.077	0.946030	0.137	0.110554	0.065	0.954	676.26	1.64	676.03	0.67	675.965 0.418
z9	0.500	0.0737	0.96	7	0.27	429	0.155	0.062809	0.967	0.998279	1.077	0.115273	0.287	0.495	701.78	20.59	702.94	5.46	703.298 1.914
z10	0.382	0.1696	0.98	12	0.34	756	0.118	0.062196	0.497	0.947672	0.569	0.110508	0.153	0.577	680.85	10.61	676.89	2.81	675.699 0.979
z11	0.409	0.3019	0.99	35	0.21	2181	0.127	0.062245	0.210	0.974534	0.267	0.113552	0.097	0.709	682.53	4.48	690.80	1.34	693.342 0.638
z12	0.404	0.7243	1.00	84	0.21	5137	0.125	0.062022	0.105	0.944430	0.162	0.110439	0.074	0.863	674.86	2.24	675.20	0.80	675.299 0.473
Scout 2																			
z1	0.569	3.6661	0.99	28	3.37	1630	0.176	0.062685	0.105	0.971679	0.164	0.112424	0.071	0.892	697.55	2.25	689.33	0.82	686.811 0.463
z2	0.641	4.7412	1.00	70	1.75	4041	0.199	0.062572	0.078	0.947231	0.138	0.109792	0.066	0.951	693.73	1.67	676.66	0.68	671.541 0.421
z3	0.574	1.5540	0.99	41	0.98	2379	0.178	0.062801	0.108	0.983431	0.164	0.113573	0.069	0.884	701.49	2.29	695.36	0.82	693.467 0.453
z4	0.489	3.2710	1.00	91	0.90	5435	0.151	0.062660	0.080	0.974504	0.139	0.112796	0.067	0.932	696.71	1.71	690.78	0.70	688.964 0.436
z5	0.553	0.9237	0.99	22	1.07	1307	0.171	0.062970	0.195	0.976892	0.254	0.112516	0.103	0.708	707.21	4.15	692.01	1.27	687.343 0.670
z6	0.549	0.4456	0.98	13	0.90	756	0.170	0.062689	0.316	0.991133	0.369	0.114668	0.093	0.658	697.69	6.73	699.30	1.87	699.800 0.618
z7	0.914	0.6520	0.99	45	0.40	2469	0.283	0.062760	0.192	0.985778	0.239	0.113918	0.076	0.719	700.11	4.08	696.56	1.20	695.464 0.501
z8	0.980	1.6586	1.00	149	0.31	7953	0.303	0.062625	0.080	0.984624	0.140	0.114031	0.068	0.928	695.52	1.71	695.97	0.70	696.116 0.451
z9	0.509	1.6722	0.99	54	0.78	3221	0.158	0.062600	0.105	0.985368	0.160	0.114162	0.067	0.884	694.67	2.25	696.35	0.81	696.875 0.443
z10	0.484	0.5429	0.99	27	0.51	1621	0.150	0.062635	0.220	0.986637	0.267	0.114245	0.084	0.661	695.87	4.70	697.00	1.35	697.353 0.555

z11	0.481	0.3973	0.99	24	0.42	1449	0.149	0.062882	0.283	0.992548	0.331	0.1144780.090	0.638	704.25	6.01	700.02	1.68	698.703 0.595
z12	0.816	0.4638	0.99	31	0.41	1731	0.252	0.062738	0.240	0.986156	0.295	0.1140020.099	0.672	699.37	5.11	696.76	1.49	695.947 0.652
z14	0.512	0.1607	0.98	12	0.33	753	0.158	0.063192	0.573	0.995280	0.660	0.1142310.200	0.558	714.68	12.18	701.41	3.34	697.275 1.319
z15	0.473	0.2056	0.98	14	0.36	862	0.146	0.063045	0.477	0.991716	0.548	0.1140860.143	0.596	709.76	10.14	699.60	2.77	696.434 0.944
z17	0.515	0.5500	0.95	6	2.21	387	0.159	0.063042	0.332	0.992508	0.385	0.1141830.098	0.627	709.65	7.06	700.00	1.94	696.996 0.646
z18	0.451	0.3858	0.99	35	0.27	2130	0.140	0.062764	0.206	0.984565	0.275	0.1137700.130	0.700	700.26	4.39	695.94	1.39	694.608 0.859
z19	0.547	0.1647	0.98	17	0.24	1034	0.169	0.063641	0.581	1.006924	0.678	0.1147520.234	0.557	729.70	12.32	707.32	3.46	700.289 1.551
z20	0.658	0.1282	0.98	14	0.24	802	0.204	0.062903	0.670	0.991783	0.756	0.1143530.197	0.542	704.94	14.26	699.63	3.82	697.978 1.304
Scout 3																		
z1	0.557	2.6721	1.00	151	0.45	8898	0.173	0.062596	0.079	0.961538	0.136	0.1114090.065	0.934	694.53	1.67	684.09	0.68	680.924 0.421
z2	0.685	1.3765	1.00	96	0.38	5464	0.213	0.061929	0.095	0.868010	0.158	0.1016550.082	0.876	671.65	2.02	634.49	0.75	624.102 0.490
z3	0.616	2.6178	1.00	63	1.08	3620	0.191	0.062602	0.091	0.941454	0.153	0.1090700.077	0.888	694.75	1.95	673.64	0.75	667.347 0.489
z4	0.755	5.3774	1.00	320	0.45	17902	0.234	0.062713	0.064	0.978042	0.126	0.1131090.065	0.979	698.52	1.35	692.60	0.63	690.779 0.427
z5	0.537	0.8951	0.99	22	1.02	1319	0.166	0.062601	0.174	0.950024	0.394	0.1100660.332	0.900	694.70	3.70	678.12	1.95	673.131 2.122
z6	0.619	2.1778	1.00	210	0.27	12161	0.192	0.062749	0.070	0.992553	0.131	0.1147210.066	0.961	699.74	1.50	700.02	0.66	700.109 0.436
z7	0.682	1.0773	1.00	121	0.23	6903	0.211	0.062690	0.090	0.987404	0.147	0.1142340.068	0.907	697.73	1.92	697.39	0.74	697.290 0.448

z8	0.547	0.2882	0.99	24	0.30	1444	0.169	0.062809	0.313	0.990118	0.371	0.114331	0.118	0.609	701.76	6.67	698.78	1.87	697.853	0.779
z9	0.723	3.4692	1.00	204	0.45	11502	0.224	0.062682	0.067	0.988406	0.129	0.114364	0.064	0.977	697.47	1.43	697.91	0.65	698.042	0.425
z10	0.592	0.4574	0.99	47	0.25	2771	0.183	0.062916	0.191	0.997825	0.241	0.115024	0.083	0.709	705.41	4.06	702.71	1.22	701.860	0.555
z11	0.537	0.2779	0.99	26	0.27	1534	0.166	0.062867	0.306	0.960626	0.358	0.110823	0.106	0.604	703.75	6.52	683.62	1.78	677.523	0.683
z12	0.555	1.7751	1.00	175	0.26	10282	0.172	0.062750	0.091	0.989714	0.146	0.114392	0.066	0.907	699.76	1.93	698.57	0.74	698.207	0.436
z13	0.611	0.8271	0.98	15	1.42	884	0.189	0.062795	0.192	0.993939	0.245	0.114797	0.079	0.763	701.31	4.08	700.73	1.24	700.548	0.523
z14	0.654	3.2361	1.00	143	0.59	8208	0.202	0.062721	0.069	0.988893	0.131	0.114350	0.065	0.976	698.78	1.46	698.16	0.66	697.962	0.429
z15	0.544	0.3069	0.98	15	0.52	894	0.169	0.063545	0.411	1.000808	0.477	0.114227	0.125	0.618	726.52	8.72	704.22	2.42	697.250	0.825
z16	0.542	0.2685	0.98	15	0.45	905	0.168	0.063117	0.389	0.993817	0.455	0.114199	0.137	0.595	712.16	8.26	700.67	2.30	697.087	0.907
z17	0.480	0.1008	0.96	7	0.34	457	0.149	0.062814	0.961	0.996385	1.155	0.115045	0.504	0.570	701.95	20.46	701.97	5.85	701.980	3.353
z18	0.674	0.1042	0.97	11	0.25	631	0.209	0.064380	0.979	1.020494	1.097	0.114964	0.241	0.571	754.12	20.67	714.16	5.62	701.511	1.604
z19	0.664	0.3998	0.99	30	0.34	1758	0.206	0.062799	0.275	0.989772	0.334	0.114309	0.114	0.642	701.43	5.85	698.60	1.68	697.726	0.751
z20	0.572	0.3569	0.99	37	0.24	2208	0.177	0.063084	0.239	0.994047	0.290	0.114284	0.091	0.672	711.06	5.07	700.78	1.47	697.581	0.604

(a) z1, z2 etc. are labels for single zircon grains or fragments annealed and chemically abraded after Mattinson (2005).

(b) Model Th/U ratio iteratively calculated from the radiogenic 208Pb/206Pb ratio and 206Pb/238U age.

(c) Pb* and Pbc represent radiogenic and common Pb, respectively; mol % 206Pb* with respect to radiogenic, blank and initial common Pb.

(d) Measured ratio corrected for spike and fractionation only. Fractionation estimated at 0.18 +/- 0.03 %/a.m.u. for Daly analyses, based on analysis of NBS-981 and NBS-982.

(e) Corrected for fractionation, spike, and common Pb; up to 1 pg of common Pb was assumed to be procedural blank: 206Pb/204Pb = 18.042 ± 0.61%; 207Pb/204Pb = 15.537 ± 0.52%; 208Pb/204Pb = 37.686 ± 0.63% (all uncertainties 1-sigma).

Excess over blank was assigned to initial common Pb, using the Stacey and Kramers (1975) two-stage Pb isotope evolution model at the nominal sample age.

(f) Errors are 2-sigma, propagated using the algorithms of Schmitz and Schoene (2007).

(g) Calculations are based on the decay constants of Jaffey et al. (1971). 206Pb/238U and 207Pb/206Pb ages corrected for initial disequilibrium in 230Th/238U using Th/U [magma] = 3.

APPENDIX 3A:

BSU zircon LA-ICPMS U-Pb geochronology

		Composition							Corrected isotope ratios								Apparent ages (Ma)					
Analysis	notes	U ppm	Th ppm	Pb ppm	206Pb / Th/U	207Pb / 204Pb	±2s / 235U	206Pb (%)	±2s / 238U	error (%)	238U corr.	±2s / 206Pb	207Pb (%)	±2s / 206Pb	207Pb (%)	±2s / 206Pb	207Pb (abs)	±2s / 235U	206Pb (abs)	±2s / 238U	% (abs)	disc.
65PL09																						
<20% discordant																						
65P_L09 9	S	1831	211	63	72	0.30	1328	4.084	5.8	0.2785	5.1	0.88	3.5903	5	0.1063	2.8	1738	51	1651	47	1584	71
65P_L09 7	S	1841	86	16	50	0.18	1948	12.009	5.4	0.4737	4.5	0.83	2.1109	5	0.1838	3.0	2688	50	2605	51	2500	94
65P_L09 14	S	1851	99	66	55	0.67	8953	9.390	5.7	0.4035	5.0	0.89	2.4781	5	0.1688	2.6	2545	44	2377	52	2185	93
65P_L09 18	S	1871	500	113	268	0.23	42020	7.632	15.8	0.3579	15.5	0.98	2.7941	15	0.1547	3.3	2398	56	2189	142	1972	263
65P_L09 15	S	1931	251	113	85	0.45	1504	3.907	6.4	0.2625	5.2	0.81	3.8092	5	0.1079	3.8	1765	69	1615	52	1503	69
65P_L09 3	S	1981	77	65	11	0.85	3995	0.966	9.9	0.1115	7.9	0.80	8.9710	8	0.0629	5.9	704	126	687	49	681	51
65P_L09 15	S	2011	228	149	132	0.65	8678	9.502	11.3	0.4027	10.6	0.94	2.4832	11	0.1711	4.0	2569	67	2388	104	2181	196
65P_L09 13	S	2021	259	131	115	0.51	1101	6.448	10.1	0.3419	6.2	0.61	2.9248	6	0.1368	8.0	2187	140	2039	89	1896	102
65P_L09 2	S	2031	68	44	9	0.64	308	0.839	10.3	0.1002	7.0	0.68	9.9800	7	0.0607	7.6	629	163	619	48	616	41
65P_L09 16	S	2041	325	123	197	0.38	2640	10.195	8.3	0.4111	7.6	0.93	2.4323	8	0.1798	3.1	2651	52	2453	76	2220	143
65P_L09 -6	S	2121	266	191	45	0.72	17793	1.292	14.5	0.1420	13.5	0.93	7.0441	13	0.0660	5.3	806	110	842	83	856	108
65P_L09 15	S	2141	287	137	204	0.48	3060	12.850	8.6	0.4566	7.7	0.89	2.1902	8	0.2041	4.0	2859	65	2669	81	2424	155

65P_L09 S 2191 -3	208	108	30	0.52	389	1.068	13.6	0.1222	11.4	0.84	8.1820	11	0.0634	7.5	721	158	738	71	743	80
65P_L09 S 2201 0	239	44	96	0.19	48591	4.924	9.5	0.3231	8.5	0.90	3.0955	9	0.1106	4.1	1809	74	1806	80	1805	134
65P_L09 S 2221 -2	180	69	116	0.38	33640	10.434	7.1	0.4739	6.2	0.88	2.1102	6	0.1597	3.4	2452	57	2474	66	2501	129
65P_L09 S 2231 18	265	248	138	0.93	2779	7.665	10.7	0.3582	10.1	0.94	2.7919	10	0.1552	3.7	2404	63	2193	96	1974	171
65P_L09 S 2241 -7	155	42	61	0.27	5651	4.753	8.5	0.3284	7.8	0.91	3.0448	8	0.1050	3.5	1714	65	1777	71	1831	124
65P_L09 S 2251 9	303	97	167	0.32	8495	7.233	11.6	0.3722	9.9	0.86	2.6864	10	0.1409	6.0	2239	104	2141	103	2040	173
65P_L09 S 2261 1	225	65	86	0.29	5231	4.365	9.9	0.3010	8.7	0.88	3.3218	9	0.1052	4.8	1717	87	1706	82	1696	130
65P_L09 S 2271 -8	204	130	91	0.64	2513	4.800	9.5	0.3325	8.6	0.91	3.0073	9	0.1047	4.0	1709	74	1785	80	1851	138
65P_L09 S 2291 11	160	39	79	0.25	10208	8.085	10.4	0.3853	9.4	0.91	2.5955	9	0.1522	4.4	2371	75	2241	94	2101	168
65P_L09 L 2551 2	158	50	58	0.32	21989	4.502	6.8	0.3047	5.8	0.85	3.2814	6	0.1071	3.6	1751	65	1731	57	1715	88
65P_L09 L 2561 -3	167	78	67	0.47	1003	4.625	6.0	0.3177	5.5	0.91	3.1471	5	0.1056	2.5	1724	46	1754	50	1779	85
65P_L09 L 2581 0	76	25	27	0.32	366	4.384	7.4	0.3040	6.6	0.90	3.2896	7	0.1046	3.3	1707	60	1709	61	1711	99
65P_L09 L 2591 3	70	23	25	0.33	719	4.618	8.6	0.3066	7.3	0.84	3.2611	7	0.1092	4.6	1786	85	1753	72	1724	110
65P_L09 L 2601 -2	169	193	122	1.14	3067	10.587	8.2	0.4762	7.7	0.94	2.0999	8	0.1612	2.9	2469	49	2488	76	2511	160
65P_L09 L 2611 -2	97	133	71	1.37	8423	11.296	9.1	0.4899	8.6	0.95	2.0412	9	0.1672	2.8	2530	46	2548	85	2570	183
65P_L09 L 2621 12	291	81	227	0.28	4258	15.976	6.2	0.5137	5.4	0.87	1.9465	5	0.2255	3.0	3021	49	2875	59	2673	119

65P_L09 L 2631	77	48	10	0.62	785	0.966	5.5	0.1161	3.7	0.67	8.6102	4	0.0603	4.1	616	88	687	27	708	25	-15
65P_L09 L 2651	68	127	53	1.87	363	12.544	5.5	0.4992	4.8	0.86	2.0030	5	0.1822	2.8	2673	47	2646	52	2611	103	2
65P_L09 L 2661	181	201	134	1.11	21554	11.962	5.1	0.4853	4.3	0.86	2.0607	4	0.1788	2.6	2642	43	2601	48	2550	92	3
65P_L09 L 2671	124	112	86	0.91	6564	12.314	5.8	0.4925	5.5	0.95	2.0306	6	0.1814	1.8	2665	30	2629	55	2581	117	3
65P_L09 L 2681	179	142	24	0.79	2324	0.937	6.1	0.1091	4.3	0.70	9.1635	4	0.0623	4.3	684	92	672	30	668	27	2
65P_L09 L 2701	201	41	138	0.20	7635	13.025	4.9	0.4954	4.5	0.92	2.0187	5	0.1907	1.9	2748	32	2681	46	2594	97	6
65P_L09 L 2741	248	427	198	1.73	19825	11.195	6.0	0.4440	5.6	0.94	2.2522	6	0.1829	2.0	2679	32	2539	55	2369	111	12
65P_L09 L 2751	211	84	111	0.40	5100	8.717	5.9	0.3865	4.9	0.83	2.5875	5	0.1636	3.3	2493	55	2309	54	2106	88	16
65P_L09 L 2781	31	16	7	0.52	225	1.859	8.5	0.1834	6.0	0.70	5.4537	6	0.0735	6.0	1028	122	1066	56	1085	60	-6
65P_L09 L 2791	133	40	45	0.30	3671	4.067	6.8	0.2834	5.1	0.75	3.5290	5	0.1041	4.5	1699	83	1648	55	1608	72	5
65P_L09 L 2801	164	58	54	0.35	109942	3.937	5.9	0.2700	5.0	0.84	3.7043	5	0.1058	3.2	1728	58	1621	48	1541	68	11
65P_L09 S 2332	166	74	68	0.45	1576	4.451	9.1	0.3154	8.7	0.96	3.1708	9	0.1024	2.6	1667	48	1722	75	1767	134	-6
65P_L09 S 2372	80	29	29	0.36	5749	4.235	9.0	0.2986	8.1	0.89	3.3494	8	0.1029	4.0	1677	75	1681	74	1684	120	0
65P_L09 S 2382	176	121	117	0.69	5702	10.266	10.0	0.4532	9.3	0.93	2.2065	9	0.1643	3.8	2500	63	2459	92	2410	186	4
65P_L09 S 2412	393	332	294	0.84	2507	10.275	17.2	0.4645	16.4	0.96	2.1529	16	0.1604	5.1	2460	86	2460	159	2459	335	0
65P_L09 S 2432	296	261	222	0.88	1065	10.700	12.8	0.4249	11.0	0.86	2.3535	11	0.1826	6.6	2677	109	2497	119	2283	212	15

65P_L09 S 2442	287	199	192	0.69	1979	9.726	11.8	0.4267	10.7	0.90	2.3433	11	0.1653	5.1	2511	86	2409	109	2291	206	9
65P_L09 S 2462	176	91	101	0.52	30091	9.090	9.5	0.4057	8.1	0.85	2.4648	8	0.1625	5.0	2482	84	2347	87	2195	151	12
65P_L09 S 2472	190	208	29	1.10	935	0.913	9.3	0.1093	7.5	0.81	9.1488	8	0.0606	5.4	624	116	659	45	669	48	-7
65P_L09 S 2482	540	66	215	0.12	1159	4.807	10.9	0.3029	8.5	0.78	3.3016	9	0.1151	6.8	1881	123	1786	92	1706	128	9
65P_L09 S 2492	324	273	183	0.84	9593	8.226	8.7	0.3836	8.4	0.96	2.6068	8	0.1555	2.4	2408	40	2256	79	2093	150	13
65P_L09 S 2532	198	68	105	0.34	935	8.040	6.4	0.4112	5.8	0.90	2.4320	6	0.1418	2.7	2249	47	2235	58	2220	108	1
>20% discordant																					
65P_L09 S 1821	729	205	401	0.28	1195501	6.786	7.4	0.2837	7.1	0.96	3.5251	7	0.1735	2.2	2592	36	2084	65	1610	101	38
65P_L09 S 1861	552	328	318	0.59	11959	7.594	7.6	0.3377	7.0	0.92	2.9610	7	0.1631	3.0	2488	50	2184	68	1876	114	25
65P_L09 S 1881	815	105	408	0.13	15346	5.856	8.3	0.2520	8.1	0.98	3.9679	8	0.1685	1.8	2543	30	1955	72	1449	105	43
65P_L09 S 1921	762	129	419	0.17	10665	6.754	8.4	0.2898	7.9	0.94	3.4504	8	0.1690	2.9	2548	48	2080	74	1641	114	36
65P_L09 S 2061	41	25	11	0.61	257	2.354	10.4	0.2257	6.5	0.63	4.4306	7	0.0756	8.0	1085	161	1229	74	1312	78	-21
65P_L09 S 2161	456	112	293	0.25	10455	11.628	13.6	0.3535	12.9	0.95	2.8285	13	0.2385	4.4	3110	70	2575	127	1951	217	37
65P_L09 L 2711	562	675	369	1.20	13122	7.172	7.0	0.3112	6.8	0.97	3.2138	7	0.1672	1.7	2529	29	2133	62	1746	104	31
65P_L09 L 2721	464	748	332	1.61	6766	7.977	6.7	0.3463	6.5	0.98	2.8873	7	0.1670	1.5	2528	25	2228	60	1917	108	24
65P_L09 S 2322	459	425	296	0.93	5905	7.470	12.3	0.3379	11.3	0.92	2.9593	11	0.1603	4.8	2459	81	2169	110	1877	185	24

Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{235}U$	±2s (%)	$^{206}Pb/^{238}U$	±2s (%)	error corr.	$^{238}U/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$ (abs)	±2s	$^{207}Pb/^{235}U$ (abs)	±2s	$^{206}Pb/^{238}U$ (abs)	±2s	% disc.
66PL09																						
<20% discordant																						
66P_L09S 103-15	1	40	24	12	0.58	1126	2.571	10.4	0.2345	6.5	0.62	4.2639	6	0.0795	8.1	1184	161	1292	76	1358	79	
66P_L09S 1045	1	100	103	67	1.03	2275	10.648	4.6	0.4577	4.0	0.87	2.1849	4	0.1687	2.3	2545	38	2493	42	2429	80	
66P_L09S 1054	1	359	145	75	0.40	1964	1.784	5.5	0.1728	4.5	0.82	5.7878	5	0.0749	3.1	1065	63	1040	36	1027	43	
66P_L09S 106-7	1	216	272	177	1.26	6104	12.475	5.0	0.5313	4.5	0.91	1.8823	5	0.1703	2.1	2561	35	2641	47	2747	101	
66P_L09S 1077	1	276	287	256	1.04	7429	20.963	5.7	0.5925	5.3	0.93	1.6877	5	0.2566	2.2	3226	34	3137	56	3000	128	
66P_L09S 108-3	1	108	67	14	0.62	970	0.838	7.1	0.1014	3.3	0.47	9.8653	3	0.0600	6.3	603	137	618	33	622	20	
66P_L09S 109-9	1	48	31	7	0.66	139	0.963	9.4	0.1145	6.5	0.69	8.7325	6	0.0610	6.8	640	146	685	47	699	43	
66P_L09S 1108	1	235	256	37	1.09	1310	1.023	6.6	0.1148	4.7	0.71	8.7100	5	0.0646	4.6	763	97	716	34	701	31	
66P_L09S 111-2	1	237	130	147	0.55	20476	10.173	4.6	0.4691	3.8	0.83	2.1316	4	0.1573	2.6	2427	43	2451	43	2480	79	
66P_L09S 1128	1	83	32	31	0.39	735	4.937	5.4	0.3104	4.4	0.81	3.2214	4	0.1154	3.2	1885	57	1809	46	1743	67	
66P_L09S 1135	1	83	62	12	0.74	390	0.911	8.3	0.1062	5.1	0.62	9.4193	5	0.0623	6.4	683	138	658	40	650	32	
66P_L09S 11510	1	233	130	132	0.56	7784	9.682	5.0	0.4209	4.2	0.83	2.3758	4	0.1668	2.8	2526	47	2405	46	2265	80	

66P_L09S 1171 14	454	405	269	0.89	24570	9.253	4.4	0.4029	4.1	0.94	2.4818	4	0.1665	1.5	2523	25	2363	40	2183	76
66P_L09S 1181 10	255	73	88	0.29	2106	4.337	4.6	0.2863	4.1	0.88	3.4933	4	0.1099	2.2	1797	40	1700	38	1623	58
66P_L09S 1191 6	171	355	143	2.07	1176	10.620	9.2	0.4516	8.1	0.88	2.2145	8	0.1706	4.4	2563	73	2490	85	2402	163
66P_L09S 1201 5	240	113	143	0.47	4082	10.193	9.2	0.4468	8.2	0.89	2.2380	8	0.1655	4.2	2512	70	2452	85	2381	163
66P_L09S 1211 6	28	18	6	0.65	328	1.907	13.0	0.1789	8.5	0.65	5.5896	8	0.0773	9.8	1130	195	1084	86	1061	83
66P_L09S 1221 -6	175	59	64	0.34	14093	4.105	6.7	0.3012	6.0	0.91	3.3202	6	0.0989	2.8	1603	52	1655	54	1697	90
66P_L09S 1231 15	208	95	75	0.46	3097	4.357	8.7	0.2786	7.8	0.90	3.5893	8	0.1134	3.8	1855	68	1704	72	1584	110
66P_L09S 1241 -2	85	55	13	0.66	213	1.054	10.5	0.1208	7.7	0.73	8.2773	8	0.0633	7.1	718	151	731	54	735	53
66P_L09S 1251 2	342	108	207	0.32	9085	10.680	6.1	0.4675	5.2	0.85	2.1391	5	0.1657	3.2	2515	54	2496	57	2473	107
66P_L09S 1271 8	520	261	458	0.50	194317	20.811	4.5	0.5849	3.8	0.85	1.7097	4	0.2581	2.4	3235	38	3130	43	2969	90
66P_L09S 1281 10	490	37	384	0.08	27304	20.808	5.1	0.5748	4.7	0.93	1.7398	5	0.2625	1.8	3262	29	3130	49	2927	112
66P_L09S 1291 1	182	70	25	0.38	2034	0.983	8.2	0.1135	6.1	0.74	8.8082	6	0.0628	5.5	701	118	695	41	693	40
66P_L09S 1311 7	218	140	102	0.64	5075	5.977	6.9	0.3438	5.9	0.86	2.9087	6	0.1261	3.5	2044	61	1972	60	1905	98
66P_L09S 1321 4	151	138	28	0.91	1670	1.262	10.9	0.1354	9.4	0.86	7.3881	9	0.0676	5.5	856	115	829	62	818	72
66P_L09S 1371 -7	217	70	55	0.32	1031	2.361	12.7	0.2164	11.0	0.87	4.6221	11	0.0791	6.3	1176	125	1231	91	1263	126
66P_L09S 1431 4	150	39	84	0.26	5915	9.788	9.7	0.4423	8.6	0.89	2.2609	9	0.1605	4.5	2461	75	2415	89	2361	170

66P_L09S 1441 -5	137	70	19	0.51	535	0.939	9.1	0.1113	7.1	0.78	8.9839	7	0.0612	5.7	646	122	673	45	680	46
66P_L09S 1471 16	411	224	238	0.55	3371	10.063	11.9	0.4102	10.9	0.91	2.4380	11	0.1779	4.9	2634	82	2441	110	2216	204
66P_L09S 1481 2	237	272	181	1.15	6385	11.257	12.1	0.4786	10.0	0.83	2.0896	10	0.1706	6.8	2564	113	2545	113	2521	209
66P_L09S 1491 3	141	38	80	0.27	1890	9.903	12.3	0.4482	10.7	0.87	2.2309	11	0.1602	6.1	2458	103	2426	114	2387	214
66P_L09S 1501 -19	179	87	26	0.49	2581	0.954	10.7	0.1158	7.5	0.71	8.6344	8	0.0597	7.5	593	164	680	53	706	50
66P_L09S 1511 -15	156	87	126	0.56	40982	14.777	13.3	0.6014	12.4	0.93	1.6629	12	0.1782	4.8	2636	80	2801	127	3035	301
66P_L09 L 2812 13	342	345	50	1.01	2988	0.946	6.7	0.1068	5.6	0.83	9.3593	6	0.0642	3.8	750	80	676	33	654	35
66P_L09 L 2822 6	605	1179	112	1.95	15559	0.924	5.3	0.1069	4.7	0.90	9.3564	5	0.0627	2.3	698	49	665	26	655	30
66P_L09 L 2832 -19	66	58	10	0.88	299	1.021	10.0	0.1222	6.3	0.63	8.1848	6	0.0606	7.7	624	167	714	51	743	44
66P_L09 L 2842 5	57	54	9	0.94	415	1.045	8.2	0.1177	5.5	0.67	8.4944	6	0.0644	6.1	755	128	727	43	717	38
66P_L09 L 2852 -1	53	46	21	0.86	2615	4.495	5.9	0.3094	4.8	0.82	3.2321	5	0.1054	3.3	1721	61	1730	49	1738	73
66P_L09 L 2862 -13	33	22	12	0.67	2361	4.091	7.5	0.3101	5.6	0.75	3.2248	6	0.0957	5.0	1542	93	1652	61	1741	85
66P_L09 L 2872 3	192	165	178	0.86	4863	19.610	7.7	0.5961	7.2	0.92	1.6777	7	0.2386	2.9	3111	47	3072	75	3014	172
66P_L09 L 2892 -5	36	29	9	0.80	477	2.073	7.7	0.1971	4.5	0.58	5.0748	4	0.0763	6.2	1103	124	1140	52	1159	47
66P_L09 L 2902 9	35	31	8	0.87	1510	2.167	8.9	0.1920	5.7	0.64	5.2090	6	0.0819	6.8	1243	134	1171	62	1132	60
66P_L09 L 2912 -11	7	3	3	0.48	97	4.766	11.4	0.3352	6.2	0.55	2.9834	6	0.1031	9.5	1681	176	1779	95	1863	100

66P_L09 -18	L	2922	213	136	28	0.64	334	0.911	6.7	0.1114	5.0	0.76	8.9765	5	0.0593	4.4	578	95	657	32	681	33
66P_L09 -12	L	2932	139	85	19	0.61	905	1.003	6.5	0.1188	4.7	0.73	8.4162	5	0.0612	4.4	646	95	705	33	724	32
66P_L09 11	L	2942	237	148	144	0.62	6077	9.936	5.3	0.4233	5.1	0.95	2.3625	5	0.1703	1.6	2560	27	2429	49	2275	97
66P_L09 3	L	2952	97	99	62	1.03	2300	10.602	5.4	0.4626	4.7	0.87	2.1618	5	0.1662	2.7	2520	45	2489	50	2451	96
66P_L09 -6	L	2962	500	905	88	1.81	3689	0.974	6.9	0.1146	6.6	0.95	8.7265	7	0.0616	2.1	661	45	690	34	699	43
66P_L09 7	L	2972	545	953	93	1.75	2458	0.968	6.3	0.1106	5.6	0.89	9.0457	6	0.0635	2.9	726	61	688	32	676	36
66P_L09 1	L	2982	65	37	8	0.57	329	0.976	8.7	0.1130	5.3	0.61	8.8526	5	0.0627	6.9	698	146	692	43	690	35
66P_L09 8	L	2992	128	82	16	0.64	4223	0.892	6.4	0.1035	4.4	0.69	9.6579	4	0.0625	4.6	690	98	647	31	635	27
66P_L09 -17	L	3002	88	64	12	0.73	275	0.941	8.5	0.1142	6.2	0.73	8.7566	6	0.0597	5.8	594	125	673	42	697	41
66P_L09 11	L	3012	66	56	9	0.85	118	0.999	9.0	0.1118	6.0	0.67	8.9412	6	0.0648	6.7	766	142	703	46	683	39
66P_L09 14	L	3022	55	53	7	0.97	379	0.952	7.3	0.1069	3.8	0.51	9.3519	4	0.0646	6.3	760	132	679	36	655	23
66P_L09 4	L	3032	64	57	9	0.89	783	0.992	6.0	0.1135	4.2	0.70	8.8140	4	0.0634	4.2	722	90	700	30	693	28
66P_L09 7	L	3042	117	136	51	1.16	2381	4.887	5.6	0.3090	5.0	0.88	3.2362	5	0.1147	2.6	1875	48	1800	48	1736	76
66P_L09 12	L	3052	128	156	57	1.21	5278	4.915	5.3	0.3022	4.7	0.90	3.3095	5	0.1180	2.3	1926	41	1805	44	1702	71
66P_L09 16	L	3072	137	123	19	0.90	1886	0.906	6.5	0.1024	5.3	0.82	9.7634	5	0.0642	3.7	747	78	655	31	629	32
66P_L09 7	L	3082	152	135	21	0.89	3874	0.899	6.6	0.1045	4.9	0.74	9.5661	5	0.0624	4.4	688	95	651	32	641	30

66P_L09 L 3092 13	114	100	16	0.88	945	0.919	8.6	0.1043	6.5	0.75	9.5896	6	0.0639	5.6	738	119	662	42	639	39
66P_L09 L 3102 5	73	55	10	0.75	222	0.963	7.9	0.1107	5.6	0.70	9.0366	6	0.0631	5.6	713	119	685	39	677	36
66P_L09S 1523 11	151	65	86	0.43	13152	9.375	10.1	0.4139	9.6	0.95	2.4161	10	0.1643	3.3	2500	55	2375	93	2233	181
66P_L09S 1533 20	219	99	106	0.45	2661	7.803	9.3	0.3545	8.0	0.85	2.8213	8	0.1597	4.9	2452	83	2209	84	1956	134
66P_L09S 1543 9	268	244	188	0.91	7099	9.932	14.2	0.4309	13.7	0.97	2.3206	14	0.1672	3.5	2529	59	2428	131	2310	267
66P_L09S 1553 14	290	358	222	1.23	17525	8.813	14.6	0.3924	14.0	0.96	2.5485	14	0.1629	4.3	2486	72	2319	133	2134	254
66P_L09S 1563 -1	328	90	166	0.27	4933	6.805	12.8	0.3846	10.5	0.83	2.5999	11	0.1283	7.2	2075	127	2086	113	2098	189
66P_L09S 1613 14	227	129	155	0.57	1985	11.390	17.2	0.4387	16.0	0.93	2.2796	16	0.1883	6.5	2728	107	2556	161	2345	314
66P_L09S 1623 5	248	71	86	0.29	2156	4.039	9.0	0.2823	8.1	0.91	3.5418	8	0.1037	3.8	1692	70	1642	73	1603	115
66P_L09S 1633 11	194	43	63	0.22	22028	3.958	9.1	0.2702	7.5	0.83	3.7015	8	0.1063	5.1	1736	93	1626	73	1542	103
66P_L09S 1643 1	110	56	40	0.51	463	4.073	11.0	0.2895	9.7	0.88	3.4543	10	0.1020	5.3	1662	99	1649	90	1639	140
66P_L09S 1653 0	149	129	73	0.87	5571	5.832	9.3	0.3543	8.1	0.86	2.8227	8	0.1194	4.7	1947	84	1951	81	1955	136
66P_L09S 1663 15	274	51	158	0.19	1478	10.875	13.1	0.4265	11.8	0.90	2.3448	12	0.1849	5.7	2698	94	2513	122	2290	228
66P_L09S 1673 8	152	79	92	0.52	932	10.497	9.1	0.4431	8.5	0.93	2.2566	8	0.1718	3.2	2575	54	2480	84	2365	168
66P_L09S 1703 3	129	66	76	0.51	771	9.760	11.4	0.4452	10.6	0.93	2.2462	11	0.1590	4.2	2445	71	2412	105	2374	210
66P_L09S 1713 12	134	18	15	0.13	139	0.885	9.8	0.1018	6.0	0.61	9.8192	6	0.0630	7.8	709	166	644	47	625	35

66P_L09S 1723	411	487	279	1.18	9096	9.141	8.1	0.3993	7.6	0.95	2.5046	8	0.1660	2.6	2518	44	2352	74	2166	141	14
66P_L09S 1733	242	89	30	0.37	778	0.929	9.0	0.1062	7.1	0.78	9.4168	7	0.0634	5.6	722	119	667	44	651	44	10
66P_L09S 1753	131	146	84	1.12	6852	9.076	10.5	0.4333	8.1	0.77	2.3077	8	0.1519	6.7	2367	114	2346	96	2321	158	2
66P_L09S 1763	189	138	114	0.73	25012	9.432	7.0	0.4169	6.3	0.90	2.3985	6	0.1641	3.0	2498	50	2381	64	2247	120	10
66P_L09S 1773	188	192	69	1.02	4523	4.227	8.8	0.2725	7.0	0.80	3.6701	7	0.1125	5.3	1840	96	1679	72	1553	97	16
66P_L09S 1783	207	96	26	0.46	3520	0.899	7.2	0.1065	5.4	0.75	9.3870	5	0.0612	4.8	646	104	651	35	653	34	-1
66P_L09S 1793	126	99	51	0.79	5320	4.126	9.4	0.3100	8.9	0.95	3.2257	9	0.0965	2.9	1558	54	1659	77	1741	136	-12
>20% discordant																					
66P_L09S 1341	172	100	29	0.58	923	1.169	12.1	0.1386	10.9	0.90	7.2157	11	0.0612	5.2	645	111	786	66	837	85	-30
66P_L09S 1361	121	51	18	0.42	511	1.022	9.3	0.1258	6.4	0.68	7.9478	6	0.0589	6.8	563	149	715	48	764	46	-36
66P_L09 L 2882	560	12	508	0.02	18498	15.773	7.4	0.3631	7.1	0.96	2.7543	7	0.3151	2.2	3546	33	2863	70	1997	121	44
66P_L09 L 3062	959	1190	635	1.24	90677	4.379	12.4	0.1876	12.2	0.99	5.3292	12	0.1692	2.0	2550	33	1708	103	1109	125	57
66P_L09S 1593	572	37	453	0.07	109979	12.331	17.0	0.3933	16.3	0.95	2.5423	16	0.2274	5.1	3034	82	2630	160	2138	296	30
66P_L09S 1603	523	144	304	0.28	88636	8.339	11.6	0.3617	11.1	0.96	2.7649	11	0.1672	3.2	2530	54	2269	105	1990	190	21
66P_L09S 1743	191	100	27	0.52	262	1.214	51.4	0.1166	14.8	0.29	8.5756	15	0.0755	49.3	1083	988	807	286	711	100	34
66P_L09S 1803	751	179	348	0.24	3023	6.397	12.8	0.2973	12.6	0.98	3.3637	13	0.1561	2.5	2413	42	2032	112	1678	185	30

Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{235}U$	±2s (%)	$^{206}Pb/^{238}U$	±2s (%)	error corr.	$^{238}U/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$ (abs)	±2s	$^{207}Pb/^{235}U$ (abs)	±2s	$^{206}Pb/^{238}U$ (abs)	% disc.
67PL09																					
<20% discordant																					
67P_L09 S 42 7	1	98	104	14	1.06	256	0.874	5.2	0.1022	3.8	0.74	9.7841	4	0.0620	3.5	674	75	638	25	627	23
67P_L09 S 43 11	1	277	188	36	0.68	1354	0.833	5.0	0.0974	3.9	0.79	10.2624	4	0.0620	3.1	674	66	615	23	599	22
67P_L09 S 44 -9	1	139	61	17	0.44	319	0.837	6.1	0.1024	4.1	0.68	9.7632	4	0.0593	4.4	577	96	618	28	629	25
67P_L09 S 45 12	1	149	293	123	1.97	32248	10.031	5.3	0.4222	5.0	0.96	2.3685	5	0.1723	1.5	2580	25	2438	49	2270	96
67P_L09 S 52 6	1	125	40	34	0.32	4175	2.781	5.4	0.2266	4.8	0.90	4.4127	5	0.0890	2.4	1404	45	1350	40	1317	57
67P_L09 S 54 11	1	295	174	38	0.59	851	0.861	5.6	0.1001	4.7	0.84	9.9901	5	0.0624	3.1	688	65	631	26	615	27
67P_L09 S 55 16	1	459	519	65	1.13	30321	0.811	5.9	0.0942	4.9	0.83	10.6157	5	0.0625	3.3	690	70	603	27	580	27
67P_L09 S 56 1	1	277	163	35	0.59	1920	0.821	5.9	0.0989	4.9	0.84	10.1143	5	0.0602	3.1	611	68	608	27	608	29
67P_L09 S 57 7	1	95	107	14	1.13	150	0.833	6.2	0.0986	3.8	0.62	10.1404	4	0.0613	4.9	649	105	615	29	606	22
67P_L09 S 59 14	1	99	152	44	1.53	2253	3.991	5.1	0.2677	4.4	0.86	3.7353	4	0.1081	2.6	1768	47	1632	41	1529	60
67P_L09 S 61 5	1	130	112	18	0.86	2415	0.888	6.3	0.1040	4.6	0.73	9.6117	5	0.0619	4.3	671	91	645	30	638	28
67P_L09 S 62 2	1	131	84	17	0.64	626	0.886	6.0	0.1045	4.6	0.76	9.5669	5	0.0615	3.9	656	84	644	29	641	28

67P_L09 S 65 1 15	304	176	39	0.58	6199	0.880	6.6	0.1004	5.8	0.88	9.9642	6	0.0636	3.1	729	66	641	31	617	34
67P_L09 S 67 1 10	357	190	49	0.53	1108	0.911	6.1	0.1047	5.3	0.87	9.5501	5	0.0631	3.0	711	65	657	29	642	32
67P_L09 S 69 1 -10	163	178	25	1.09	390	0.874	7.7	0.1062	6.0	0.78	9.4166	6	0.0597	4.8	591	105	638	36	651	37
67P_L09 S 70 1 9	95	67	14	0.71	265	0.964	8.3	0.1095	5.3	0.64	9.1350	5	0.0639	6.4	738	135	686	41	670	34
67P_L09 S 74 1 9	265	118	180	0.44	24398	10.085	12.0	0.4330	11.6	0.97	2.3095	12	0.1689	3.1	2547	53	2443	111	2319	225
67P_L09 S 75 1 9	466	863	87	1.85	2352	0.886	9.0	0.1028	8.2	0.91	9.7236	8	0.0625	3.8	692	80	644	43	631	49
67P_L09 S 76 1 -17	306	668	59	2.18	3612	0.825	7.4	0.1028	6.1	0.82	9.7312	6	0.0582	4.3	537	93	611	34	631	37
67P_L09 S 77 1 16	114	100	16	0.87	661	0.903	9.0	0.1020	6.8	0.75	9.8046	7	0.0642	6.0	749	126	653	44	626	41
67P_L09 S 78 1 4	169	96	65	0.57	2106	4.070	11.9	0.2850	10.8	0.91	3.5083	11	0.1036	4.9	1689	91	1648	97	1617	154
67P_L09 S 79 1 3	171	137	70	0.80	2719	4.012	10.5	0.2851	9.6	0.92	3.5081	10	0.1021	4.2	1662	78	1637	86	1617	138
67P_L09 S 80 1 -10	197	130	29	0.66	888	0.934	9.4	0.1120	8.3	0.89	8.9260	8	0.0605	4.3	620	94	670	46	685	54
67P_L09 S 81 1 13	107	103	44	0.96	970	4.158	7.1	0.2744	5.8	0.81	3.6447	6	0.1099	4.2	1798	76	1666	59	1563	80
67P_L09 S 83 1 12	514	422	74	0.82	13978	0.893	10.0	0.1025	8.7	0.87	9.7526	9	0.0631	4.9	713	105	648	48	629	52
67P_L09 S 84 1 13	110	99	35	0.89	505	2.800	9.6	0.2196	8.8	0.92	4.5543	9	0.0925	3.8	1478	72	1356	72	1280	102
67P_L09 S 85 1 10	158	139	24	0.88	544	0.969	10.3	0.1097	8.9	0.87	9.1171	9	0.0641	5.2	745	109	688	51	671	57
67P_L09 S 86 1 18	65	61	9	0.94	137	0.889	10.9	0.1004	7.4	0.68	9.9627	7	0.0642	8.0	749	169	646	52	617	43

67P_L09 S 89 1 13	233	237	35	1.02	463	0.897	8.2	0.1025	6.2	0.75	9.7580	6	0.0635	5.4	723	115	650	39	629	37
67P_L09 S 90 1 -9	301	304	243	1.01	21458	11.458	15.6	0.5155	15.2	0.97	1.9400	15	0.1612	3.5	2468	59	2561	146	2680	334
67P_L09 S 91 1 7	247	102	31	0.41	3855	0.856	8.2	0.1006	7.1	0.87	9.9420	7	0.0618	4.1	666	87	628	38	618	42
67P_L09 S 93 1 3	1141	82739	8725	0.24	407	16.071	10.5	0.5522	8.6	0.82	1.8108	9	0.2111	5.9	2914	96	2881	100	2834	198
67P_L09 S 94 1 -2	171	144	26	0.85	654	0.959	9.1	0.1123	7.7	0.84	8.9069	8	0.0619	4.9	672	106	683	45	686	50
67P_L09 S 99 1 -4	255	178	37	0.70	1065	0.938	7.3	0.1108	5.6	0.77	9.0234	6	0.0614	4.7	653	100	672	36	678	36
67P_L09 S 1011 -6	129	65	51	0.50	3041	4.418	8.2	0.3138	7.1	0.87	3.1864	7	0.1021	4.1	1662	76	1716	68	1760	109
67P_L09 S 1031 10	372	281	51	0.76	692	0.871	10.7	0.1012	8.9	0.84	9.8840	9	0.0625	5.8	690	124	636	50	621	53
67P_L09 S 1061 12	271	328	194	1.21	7370	9.467	5.6	0.4102	4.8	0.87	2.4376	5	0.1674	2.7	2531	46	2384	51	2216	91
67P_L09 S 1091 9	63	55	10	0.88	1022	1.085	9.7	0.1194	6.1	0.63	8.3728	6	0.0659	7.5	802	158	746	51	727	42
67P_L09 S 1101 6	224	84	84	0.38	1731	4.336	9.6	0.2922	9.0	0.94	3.4221	9	0.1076	3.3	1759	60	1700	79	1653	131
67P_L09 S 1131 13	236	175	86	0.74	84506	3.676	5.1	0.2575	4.9	0.95	3.8837	5	0.1036	1.6	1689	29	1566	41	1477	65
67P_L09 S 1141 -3	165	136	23	0.82	1238	0.922	5.4	0.1091	4.9	0.89	9.1639	5	0.0613	2.5	648	53	663	27	668	31
67P_L09 S 1151 11	99	138	15	1.40	763	0.957	8.2	0.1084	5.6	0.68	9.2287	6	0.0641	6.1	744	128	682	41	663	35
67P_L09 L 2352 -9	45	43	7	0.95	241	0.898	9.4	0.1083	6.6	0.71	9.2305	7	0.0601	6.7	609	144	651	45	663	42
67P_L09 L 2372 18	58	42	9	0.73	1398	1.082	11.4	0.1160	8.0	0.71	8.6206	8	0.0677	8.1	858	167	745	60	708	54

67P_L09 L 2392 15	143	659	41	4.59	956	0.844	6.6	0.0974	5.0	0.76	10.2631	5	0.0629	4.3	703	91	622	31	599	29
67P_L09 L 2412 0	246	236	37	0.96	887	0.882	10.5	0.1047	8.9	0.85	9.5531	9	0.0611	5.6	643	120	642	50	642	54
67P_L09 L 2422 16	156	83	91	0.53	4528	8.774	8.0	0.3856	7.3	0.91	2.5935	7	0.1650	3.3	2508	56	2315	73	2102	130
67P_L09 L 2452 7	60	88	10	1.47	112098	0.994	10.2	0.1126	8.3	0.82	8.8773	8	0.0640	5.9	742	124	701	51	688	54
67P_L09 L 2472 -13	106	77	16	0.72	1128	0.956	11.2	0.1147	9.5	0.85	8.7170	10	0.0604	5.8	618	126	681	55	700	63
67P_L09 L 2492 7	258	203	35	0.79	1398	0.865	5.5	0.1013	4.4	0.80	9.8690	4	0.0619	3.3	671	71	633	26	622	26
67P_L09 L 2522 7	144	144	22	1.00	823	0.968	5.5	0.1106	4.6	0.84	9.0407	5	0.0634	3.0	723	63	687	27	676	29
67P_L09 L 2552 14	180	155	25	0.86	11345	0.942	5.7	0.1060	4.8	0.85	9.4333	5	0.0644	2.9	755	62	674	28	650	30
67P_L09 L 2562 5	64	79	10	1.24	781	0.967	7.5	0.1111	5.5	0.73	9.0027	5	0.0631	5.1	712	108	687	37	679	35
67P_L09 L 2572 4	84	88	12	1.06	482	0.977	5.9	0.1122	4.0	0.69	8.9114	4	0.0632	4.3	713	91	692	30	686	26
67P_L09 L 2582 13	60	54	8	0.90	170	0.956	8.5	0.1075	5.7	0.68	9.2984	6	0.0644	6.2	756	131	681	42	658	36
67P_L09 L 2592 3	244	198	35	0.81	1136	0.984	7.7	0.1132	6.9	0.90	8.8364	7	0.0631	3.4	710	73	696	39	691	45
67P_L09 L 2602 9	265	54	33	0.20	1343	0.976	6.3	0.1106	5.8	0.91	9.0453	6	0.0640	2.6	742	56	691	32	676	37
67P_L09 L 2612 6	276	394	43	1.43	3056	0.893	6.7	0.1041	5.6	0.84	9.6058	6	0.0622	3.6	682	76	648	32	638	34
67P_L09 L 2622 14	504	698	77	1.38	1617	0.864	8.3	0.0995	7.8	0.95	10.0495	8	0.0630	2.7	708	57	632	39	612	46
67P_L09 L 2632 8	225	347	36	1.55	1265	0.931	10.0	0.1069	9.2	0.92	9.3536	9	0.0631	4.0	713	85	668	49	655	57

67P_L09 L 2642		111	54	39	0.49	1601	4.244	5.9	0.2769	5.1	0.87	3.6109	5	0.1111	2.9	1818	53	1683	48	1576	71	13
67P_L09 L 2652		58	59	8	1.02	18618	0.933	7.9	0.1104	5.6	0.71	9.0583	6	0.0613	5.6	649	119	669	39	675	36	-4
67P_L09 L 2662		117	118	17	1.01	662	0.972	6.5	0.1098	5.6	0.86	9.1103	6	0.0642	3.3	750	69	690	32	671	36	10
67P_L09 Bulk 189	3	213	108	125	0.51	7648	9.044	9.3	0.3853	8.7	0.93	2.5956	9	0.1703	3.4	2560	56	2342	85	2101		15518
67P_L09 Bulk 195	3	123	114	58	0.92	1395	5.260	10.8	0.3327	9.8	0.90	3.0055	10	0.1146	4.6	1874	83	1862	92	1852		1571
67P_L09 Bulk 199	3	87	31	31	0.36	1018	4.427	7.1	0.2890	6.2	0.87	3.4599	6	0.1111	3.5	1817	63	1717	59	1637		90 10
67P_L09 Bulk 200	3	195	73	74	0.38	29018	4.316	10.1	0.2945	9.0	0.89	3.3955	9	0.1063	4.5	1737	83	1696	83	1664		1324
67P_L09 Bulk 204	3	277	195	181	0.70	7535	9.183	11.6	0.3899	10.9	0.94	2.5649	11	0.1708	3.8	2566	64	2356	106	2122		19717
67P_L09 Bulk 206	3	303	229	44	0.75	1989	0.924	8.6	0.1095	7.2	0.83	9.1316	7	0.0612	4.7	646	102	664	42	670		46 -4
67P_L09 Bulk 207	3	151	101	103	0.67	3918	10.493	6.4	0.4425	5.7	0.89	2.2597	6	0.1720	2.9	2577	49	2479	59	2362		1138
67P_L09 Bulk 211	3	457	279	67	0.61	1725	0.970	7.6	0.1118	6.2	0.82	8.9410	6	0.0629	4.4	704	93	688	38	683		40 3
67P_L09 Bulk 222	3	188	109	68	0.58	7380	3.995	7.5	0.2710	5.9	0.80	3.6902	6	0.1069	4.5	1748	83	1633	61	1546		82 12
67P_L09 Bulk 227	3	161	158	114	0.99	500	10.728	7.4	0.4268	6.5	0.87	2.3428	6	0.1823	3.6	2674	59	2500	69	2291		12414
67P_L09 Bulk 229	3	65	59	10	0.92	350	0.955	12.8	0.1153	7.0	0.54	8.6749	7	0.0601	10.7	607	232	681	63	703		46 -16
67P_L09 Bulk 233	3	232	322	172	1.39	1697	9.322	6.5	0.3877	6.1	0.94	2.5793	6	0.1744	2.2	2600	37	2370	60	2112		11019
67P_L09 Bulk 234	3	88	67	62	0.76	2139	11.593	5.5	0.4854	4.7	0.86	2.0602	5	0.1732	2.8	2589	47	2572	51	2551		99 1

67P_L09 Bulk 236	3	241	184	34	0.76	3721	0.903	10.1	0.1070	7.6	0.76	9.3467	8	0.0612	6.6	646	142	653	49	655	48 -1
67P_L09 Bulk 240	3	123	82	74	0.67	2261	9.626	6.2	0.4249	5.8	0.94	2.3532	6	0.1643	2.1	2500	36	2400	57	2283	1129
67P_L09 Bulk 241	3	224	277	84	1.23	3225	3.333	11.0	0.2404	10.6	0.96	4.1598	11	0.1006	3.2	1634	59	1489	86	1389	13215
67P_L09 Bulk 243	3	270	90	79	0.33	1522	3.009	7.9	0.2277	7.1	0.89	4.3915	7	0.0958	3.6	1544	68	1410	61	1323	85 14
67P_L09 Bulk 246	3	89	78	13	0.87	771	0.965	10.5	0.1119	6.4	0.61	8.9388	6	0.0625	8.3	693	177	686	52	684	41 1
67P_L09 Bulk 247	3	118	106	17	0.90	149	0.962	10.6	0.1107	7.1	0.67	9.0314	7	0.0630	7.9	708	169	684	53	677	46 4
67P_L09 Bulk 249	3	38	37	6	0.97	58	0.986	14.2	0.1140	8.2	0.58	8.7734	8	0.0627	11.6	700	246	697	71	696	54 1
67P_L09 Bulk 254	3	172	215	29	1.25	482	0.987	8.9	0.1128	4.8	0.54	8.8630	5	0.0635	7.5	724	158	697	45	689	31 5
67P_L09 Bulk 256	3	28	11	4	0.39	273	0.956	16.6	0.1149	7.5	0.46	8.7051	8	0.0604	14.7	617	318	681	82	701	50 -14
67P_L09 Bulk 260	3	67	63	53	0.95	242	14.238	9.0	0.4610	6.3	0.70	2.1690	6	0.2240	6.4	3009	103	2766	85	2444	12819
67P_L09 Bulk 266	3	125	48	76	0.38	3998	10.172	7.6	0.4541	7.1	0.94	2.2020	7	0.1625	2.6	2481	44	2451	70	2414	1433
67P_L09 Bulk 267	3	371	350	58	0.94	3115	0.880	7.4	0.1077	6.6	0.88	9.2855	7	0.0592	3.5	576	75	641	35	659	41 -14
67P_L09 Bulk 270	3	444	385	62	0.87	313	0.842	9.1	0.0965	7.4	0.82	10.3585	7	0.0633	5.2	717	111	620	42	594	42 17
67P_L09 Bulk 273	3	245	352	188	1.44	2503	9.159	9.5	0.3805	9.0	0.95	2.6279	9	0.1746	3.0	2602	51	2354	87	2079	16020
67P_L09 Bulk 275	3	135	121	99	0.89	2101	10.935	6.5	0.4660	5.8	0.90	2.1459	6	0.1702	2.9	2559	48	2518	60	2466	1194
67P_L09 Bulk 280	3	68	51	9	0.75	318	1.012	9.7	0.1119	6.5	0.67	8.9377	6	0.0656	7.2	794	152	710	50	684	42 14

67P_L09 Bulk 284	4	159	64	58	0.40	1911	4.113	8.0	0.2795	7.5	0.93	3.5773	7	0.1067	2.8	1744	52	1657	65	1589	1059	
67P_L09 Bulk 286	4	589	1101	113	1.87	1653	0.867	9.1	0.1014	8.7	0.95	9.8607	9	0.0620	2.7	675	58	634	43	623	51	8

>20% discordant

67P_L09 S 40	1	1020	1477	156	1.45	3497	0.791	6.4	0.0843	4.5	0.70	11.8620	5	0.0680	4.6	870	94	592	29	522	23	40
67P_L09 S 41	1	1049	1434	161	1.37	10731	0.728	5.5	0.0850	5.1	0.93	11.7714	5	0.0621	2.0	678	42	555	23	526	26	23
67P_L09 S 50	1	259	144	30	0.56	368	0.803	7.8	0.0908	6.3	0.81	11.0128	6	0.0641	4.6	746	96	598	35	560	34	25
67P_L09 S 51	1	190	127	24	0.67	1195	0.894	5.9	0.0996	5.0	0.85	10.0432	5	0.0651	3.1	778	65	649	28	612	29	21
67P_L09 S 53	1	448	133	139	0.30	29768	3.209	5.8	0.2167	5.3	0.92	4.6157	5	0.1074	2.3	1756	42	1459	45	1264	61	28
67P_L09 S 63	1	774	631	625	0.82	4071	8.105	12.5	0.2303	12.3	0.99	4.3424	12	0.2552	1.9	3218	31	2243	113	1336	149	58
67P_L09 S 64	1	410	163	234	0.40	34387	7.323	6.1	0.3263	5.9	0.95	3.0648	6	0.1628	1.9	2485	31	2152	55	1820	93	27
67P_L09 S 72	1	374	150	45	0.40	999	0.868	6.3	0.0964	4.9	0.77	10.3726	5	0.0653	4.0	785	84	635	30	593	28	24
67P_L09 S 73	1	371	565	298	1.52	11315	8.558	10.2	0.3656	9.7	0.95	2.7349	10	0.1698	3.3	2555	56	2292	93	2009	167	21
67P_L09 S 87	1	588	544	88	0.93	4515	0.943	14.0	0.0993	12.3	0.88	10.0698	12	0.0689	6.7	895	139	675	69	610	72	32
67P_L09 S 98	1	581	175	10	0.30	300	0.106	9.6	0.0151	7.5	0.78	66.2304	7	0.0508	6.1	231	140	102	9	97	7	58
67P_L09 S 1001	764	705	329	0.92	11673	5.014	22.5	0.2294	22.2	0.99	4.3596	22	0.1585	3.4	2440	57	1822	190	1331	267	45	
67P_L09 S 1021	836	474	478	0.57	13221	5.703	14.8	0.2390	14.1	0.96	4.1833	14	0.1730	4.4	2587	73	1932	127	1382	175	47	

67P_L09 S	1081	66	58	11	0.89	1833	0.998	12.5	0.1264	8.3	0.67	7.9098	8	0.0572	9.3	501	205	703	63	767	60	-53	
67P_L09 L	2342	442	310	57	0.70	2834	0.799	7.0	0.0908	6.1	0.87	11.0188	6	0.0639	3.4	737	72	596	31	560	33	24	
67P_L09 L	2402	105	544	34	5.16	242	1.031	11.0	0.1078	9.1	0.83	9.2754	9	0.0694	6.2	909	128	719	57	660	57	27	
67P_L09 L	2512	250	329	35	1.32	669	0.943	5.5	0.1011	4.0	0.73	9.8900	4	0.0677	3.8	858	78	675	27	621	24	28	
67P_L09 Bulk	190	3	687	885	144	1.29	264	1.626	21.1	0.1040	9.6	0.45	9.6186	10	0.1134	18.9	1855	341	980	133	638	58	66
67P_L09 Bulk	193	3	279	47	110	0.17	582	4.730	9.8	0.2694	7.2	0.73	3.7117	7	0.1273	6.7	2061	118	1772	82	1538	98	25
67P_L09 Bulk	196	3	451	142	169	0.32	383	4.356	11.0	0.2311	10.4	0.95	4.3279	10	0.1367	3.6	2186	62	1704	91	1340	126	39
67P_L09 Bulk	198	3	455	149	108	0.33	776	2.825	12.1	0.1632	11.4	0.95	6.1292	11	0.1256	3.9	2037	68	1362	91	974	103	52
67P_L09 Bulk	201	3	607	404	305	0.67	22053	5.997	12.4	0.2492	11.7	0.95	4.0121	12	0.1745	4.0	2601	66	1975	108	1435	151	45
67P_L09 Bulk	202	3	206	142	29	0.69	777	1.030	9.5	0.1066	7.8	0.82	9.3850	8	0.0701	5.4	932	112	719	49	653	49	30
67P_L09 Bulk	209	3	987	731	462	0.74	2342	5.298	29.4	0.2371	29.1	0.99	4.2183	29	0.1621	4.4	2478	74	1869	251	1371	359	45
67P_L09 Bulk	212	3	710	558	380	0.79	22878	4.883	9.6	0.2163	9.0	0.93	4.6233	9	0.1637	3.4	2495	58	1799	81	1262	103	49
67P_L09 Bulk	213	3	1167	624	401	0.53	2958	2.721	13.2	0.1238	13.0	0.98	8.0803	13	0.1595	2.6	2450	43	1334	98	752	92	69
67P_L09 Bulk	215	3	299	129	102	0.43	#DIV/0!	3.611	7.2	0.2426	6.3	0.88	4.1227	6	0.1080	3.5	1765	63	1552	57	1400	79	21
67P_L09 Bulk	217	3	441	619	97	1.40	239	1.877	21.0	0.1180	9.4	0.45	8.4763	9	0.1154	18.8	1886	338	1073	139	719	64	62
67P_L09 Bulk	225	3	293	383	234	1.31	12490	9.498	9.6	0.3829	9.1	0.95	2.6117	9	0.1799	3.0	2652	50	2387	88	2090	163	21

67P_L09 Bulk 230	3	558	634	411	1.14	293	7.893	13.1	0.2663	12.1	0.92	3.7547	12	0.2149	5.1	2943	82	2219	118	1522	16448
67P_L09 Bulk 235	3	616	818	296	1.33	44	3.357	43.9	0.1601	23.8	0.54	6.2479	24	0.1521	36.9	2370	629	1494	343	957	21160
67P_L09 Bulk 237	3	804	180	574	0.22	29796	5.637	20.9	0.1524	20.1	0.96	6.5613	20	0.2683	5.8	3296	91	1922	180	914	17172
67P_L09 Bulk 238	3	1417	1784	525	1.26	373	2.493	19.7	0.1008	18.7	0.95	9.9247	19	0.1795	6.2	2648	103	1270	143	619	11077
67P_L09 Bulk 242	3	878	1707	454	1.94	1243	4.222	22.9	0.1835	22.5	0.99	5.4496	23	0.1669	3.9	2526	65	1678	188	1086	22557
67P_L09 Bulk 252	3	429	162	399	0.38	78	13.123	18.2	0.3445	8.3	0.45	2.9030	8	0.2763	16.2	3342	254	2689	172	1908	13743
67P_L09 Bulk 253	3	84	65	14	0.77	448	1.466	12.9	0.1221	6.7	0.52	8.1918	7	0.0871	11.0	1363	213	917	78	742	47 46
67P_L09 Bulk 255	3	78	46	35	0.58	378	5.716	17.0	0.2962	6.3	0.37	3.3760	6	0.1400	15.8	2227	273	1934	147	1672	93 25
67P_L09 Bulk 259	3	681	506	348	0.74	4594	5.639	22.0	0.2456	21.8	0.99	4.0712	22	0.1665	3.3	2523	56	1922	190	1416	27744
67P_L09 Bulk 262	3	269	170	51	0.63	3834	1.566	22.1	0.1227	9.7	0.44	8.1499	10	0.0926	19.9	1479	377	957	137	746	68 50
67P_L09 Bulk 263	3	457	395	299	0.86	9627	6.827	9.4	0.2951	9.2	0.98	3.3886	9	0.1678	1.8	2536	31	2089	83	1667	13534
67P_L09 Bulk 265	3	396	309	100	0.78	382	2.666	10.6	0.1606	9.8	0.93	6.2276	10	0.1204	4.0	1962	71	1319	78	960	88 51
67P_L09 Bulk 268	3	800	102	315	0.13	8487	4.230	13.8	0.1825	13.5	0.98	5.4782	13	0.1681	2.8	2538	48	1680	113	1081	13457
67P_L09 Bulk 269	3	538	232	307	0.43	6975	5.653	12.1	0.2537	11.3	0.94	3.9410	11	0.1616	4.2	2472	70	1924	104	1458	14841
67P_L09 Bulk 272	3	267	588	223	2.20	23537	8.490	8.2	0.3602	7.5	0.92	2.7759	7	0.1709	3.3	2567	55	2285	74	1983	12723
67P_L09 Bulk 274	3	226	117	179	0.52	151	12.480	11.6	0.3969	6.1	0.53	2.5196	6	0.2280	9.9	3038	158	2641	109	2155	11229

67P_L09	Bulk	278	3	175	125	28	0.72	205	1.329	11.4	0.1222	8.9	0.78	8.1836	9	0.0789	7.1	1170	141	859	66	743
63 36																						
67P_L09	Bulk	279	3	460	392	288	0.85	4264	6.890	9.4	0.2864	9.1	0.96	3.4921	9	0.1745	2.7	2601	45	2097	84	1623
13038																						

Analysis	U notes	Th ppm	Pb ppm	ppm	^{206}Pb Th/U	^{207}Pb ^{204}Pb	±2s ^{235}U	^{206}Pb (%)	±2s ^{238}U	error (%)	^{238}U corr.	±2s ^{206}Pb	^{207}Pb (%)	±2s ^{206}Pb	^{207}Pb (%)	±2s ^{206}Pb	^{207}Pb (abs)	±2s ^{235}U	^{206}Pb (abs)	±2s ^{238}U	% (abs)	disc.
68PL09																						
<20% discordant																						
68P_L09	S	1181	210	109	27	0.52	647	0.929	4.7	0.1045	4.1	0.87	9.5662	4	0.0645	2.3	757	49	667	23	641	25
15																						
68P_L09	S	1201	239	134	32	0.56	8939	0.892	6.0	0.1058	4.6	0.76	9.4560	5	0.0612	3.9	647	84	648	29	648	28
0																						
68P_L09	S	1221	135	94	20	0.70	2593	1.021	5.9	0.1136	4.6	0.78	8.8039	5	0.0652	3.6	781	77	715	30	694	30
11																						
68P_L09	S	1241	311	167	40	0.54	1616	0.874	5.2	0.0996	4.2	0.81	10.0390	4	0.0636	3.0	729	64	638	25	612	25
16																						
68P_L09	S	1251	297	172	41	0.58	1567	0.961	8.9	0.1101	8.1	0.92	9.0791	8	0.0633	3.5	718	74	684	44	674	52
6																						
68P_L09	S	1291	300	169	40	0.56	1258	0.863	4.8	0.1029	4.1	0.85	9.7145	4	0.0608	2.6	633	55	632	23	632	25
0																						
68P_L09	S	1301	822	334	104	0.41	6030	0.822	5.3	0.0942	4.9	0.92	10.6124	5	0.0633	2.0	717	43	609	24	581	27
19																						
68P_L09	S	1321	172	170	25	0.99	8854	0.860	7.0	0.1021	4.8	0.68	9.7944	5	0.0611	5.1	643	110	630	33	627	29
3																						
68P_L09	S	1341	269	213	102	0.79	7714	3.761	6.4	0.2544	5.7	0.89	3.9301	6	0.1072	2.9	1752	53	1584	51	1461	75
17																						
68P_L09	S	1351	319	232	45	0.73	2095	0.891	6.3	0.1056	5.0	0.79	9.4712	5	0.0612	3.8	646	82	647	30	647	31
0																						

68P_L09 S 1381	492	609	81	1.24	1064	0.862	6.5	0.1000	4.6	0.71	10.0006	5	0.0625	4.5	692	97	631	30	614	27	11
68P_L09 S 1401	200	123	72	0.61	16632	3.647	11.1	0.2577	9.7	0.88	3.8797	10	0.1026	5.3	1672	98	1560	88	1478	128	12

>20% discordant

68P_L09 S 1161	298	203	43	0.68	1588	1.017	7.9	0.1068	6.1	0.78	9.3661	6	0.0691	4.9	902	101	713	40	654	38	28
68P_L09 S 1171	132	573	36	4.34	5834	0.893	5.3	0.0988	3.1	0.58	10.1171	3	0.0655	4.3	790	91	648	26	608	18	23
68P_L09 S 1191	615	489	374	0.80	55485	6.146	6.8	0.2585	6.6	0.97	3.8678	7	0.1724	1.7	2581	29	1997	59	1482	87	43
68P_L09 S 1211	597	443	196	0.74	7767	2.515	4.9	0.1932	4.6	0.93	5.1755	5	0.0944	1.8	1516	34	1276	36	1139	48	25
68P_L09 S 1231	787	1131	413	1.44	4513	4.945	8.6	0.2181	8.5	0.99	4.5846	9	0.1644	1.3	2502	22	1810	73	1272	99	49
68P_L09 S 1271	1467	1759	215	1.20	4939	0.690	4.8	0.0778	4.3	0.90	12.8500	4	0.0643	2.1	751	44	533	20	483	20	36
68P_L09 S 1281	440	574	298	1.30	6175	7.289	5.6	0.3103	5.1	0.90	3.2231	5	0.1704	2.4	2562	40	2148	50	1742	77	32
68P_L09 S 1331	754	679	88	0.90	3358	0.681	5.7	0.0785	5.0	0.86	12.7436	5	0.0629	2.9	705	62	527	24	487	23	31
68P_L09 S 1371	535	432	76	0.81	1424	0.871	4.6	0.0975	4.1	0.88	10.2566	4	0.0648	2.2	766	46	636	22	600	23	22
68P_L09 S 1412	305	178	38	0.58	661	0.865	5.8	0.0940	4.9	0.85	10.6361	5	0.0667	3.0	828	63	633	27	579	27	30
68P_L09 S 1442	317	217	41	0.69	3047	0.858	7.7	0.0950	5.8	0.75	10.5213	6	0.0655	5.1	789	107	629	36	585	32	26
68P_L09 S 1452	721	603	102	0.84	7773	0.783	8.6	0.0902	7.8	0.90	11.0871	8	0.0629	3.7	706	78	587	38	557	41	21
68P_L09 S 1472	475	194	411	0.41	7588	11.071	17.2	0.2798	16.8	0.98	3.5735	17	0.2869	3.7	3401	58	2529	160	1591	237	53

Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	^{206}Pb/^{204}Pb	^{207}Pb/^{235}U	±2s (%)	^{206}Pb/^{238}U	±2s (%)	error corr.	^{238}U/^{206}Pb	±2s (%)	^{207}Pb/^{206}Pb	±2s (%)	^{207}Pb/^{206}Pb (abs)	±2s	^{207}Pb/^{235}U (abs)	±2s	^{206}Pb/^{238}U (abs)	±2s	% disc.
68P_L09 S 1482		479	263	274	0.55	3879	6.973	13.0	0.2863	12.2	0.94	3.4927	12	0.1766	4.4	2621	73	2108	115	1623	175	38
72PL09																						
<20% discordant																						
72P_L09 M_1	1	58	48	44	0.83	8473	13.964	4.2	0.5260	4.0	0.95	1.9011	4	0.1925	1.4	2764	22	2747	40	2725	88	1
72P_L09 M_2	1	128	62	40	0.48	3499	3.151	4.9	0.2499	4.2	0.84	4.0020	4	0.0915	2.7	1456	51	1445	38	1438	54	1
72P_L09 M_3	1	34	25	9	0.73	2082	2.171	6.2	0.2029	4.4	0.71	4.9274	4	0.0776	4.3	1136	86	1172	43	1191	48	-5
72P_L09 M_4	1	181	223	186	1.23	6375	19.341	5.4	0.5498	5.3	0.98	1.8188	5	0.2551	1.1	3217	17	3059	52	2824	121	12
72P_L09 M_5	1	110	78	49	0.71	1024	5.184	4.0	0.3288	3.7	0.92	3.0410	4	0.1143	1.6	1869	28	1850	34	1833	58	2
72P_L09 M_6	1	183	143	144	0.78	32510	14.240	3.7	0.4825	3.5	0.96	2.0724	4	0.2140	1.1	2936	18	2766	35	2538	74	14
72P_L09 M_7	1	122	59	48	0.48	1188	4.645	4.7	0.3078	4.5	0.97	3.2491	5	0.1095	1.2	1790	22	1757	39	1730	69	3
72P_L09 M_8	1	364	199	92	0.55	20731	2.085	4.2	0.1848	4.0	0.96	5.4099	4	0.0818	1.2	1240	24	1144	29	1093	40	12
72P_L09 M_11	1	133	129	19	0.97	423	0.916	6.7	0.1056	5.7	0.84	9.4694	6	0.0629	3.6	705	77	660	33	647	35	8
72P_L09 M_12	1	122	90	46	0.74	4490	4.178	5.3	0.2814	4.9	0.93	3.5535	5	0.1077	1.9	1760	34	1670	43	1598	70	9
72P_L09 M_13	1	306	85	71	0.28	157581	2.119	5.1	0.1871	4.8	0.95	5.3445	5	0.0821	1.6	1249	32	1155	35	1106	49	11

72P_L09 M_14 99 3	1	56	37	43	0.67	1611	16.404	4.6	0.5574	4.3	0.93	1.7941	4	0.2134	1.7	2932	27	2901	44	2856
72P_L09 M_16 48 1	1	85	53	20	0.62	2741	2.106	5.7	0.1946	4.6	0.81	5.1391	5	0.0785	3.3	1160	66	1151	39	1146
72P_L09 M_18 34 10	1	257	144	56	0.56	3233	1.740	4.2	0.1659	3.7	0.88	6.0281	4	0.0761	2.0	1097	40	1023	27	989
72P_L09 M_19 36 18	1	48	26	15	0.54	5756	3.614	7.2	0.2475	2.8	0.39	4.0397	3	0.1059	6.6	1730	122	1553	57	1426
72P_L09 M_20 12319	1	165	166	163	1.01	14051	20.705	5.7	0.5298	5.5	0.97	1.8876	5	0.2835	1.4	3382	23	3125	55	2741
72P_L09 M_23 83 15	1	222	138	138	0.62	15746	9.274	4.7	0.3989	4.5	0.97	2.5066	5	0.1686	1.1	2544	18	2365	43	2164
72P_L09 M_24 72 14	1	247	59	83	0.24	5880	3.904	5.6	0.2636	5.4	0.96	3.7929	5	0.1074	1.5	1756	28	1614	45	1508
72P_L09 M_26 69 18	1	240	13	153	0.05	20449	12.549	4.1	0.4400	3.5	0.85	2.2727	4	0.2068	2.2	2881	35	2646	39	2351
72P_L09 M_28 63 7	1	164	90	106	0.55	20803	10.051	3.5	0.4393	3.2	0.91	2.2766	3	0.1660	1.4	2517	24	2439	32	2347
72P_L09 M_30 1027	1	106	24	59	0.23	9341	9.832	5.5	0.4328	5.3	0.95	2.3103	5	0.1647	1.7	2505	29	2419	51	2319
72P_L09 M_31 31 11	1	34	31	8	0.92	677	1.906	4.4	0.1755	3.3	0.74	5.6995	3	0.0788	3.0	1167	59	1083	29	1042
72P_L09 M_32 66 13	1	215	109	141	0.51	6556	10.521	3.5	0.4285	3.4	0.97	2.3340	3	0.1781	0.9	2635	15	2482	33	2299
72P_L09 M_36 98 17	1	242	178	152	0.74	8060	8.570	5.8	0.3781	5.5	0.96	2.6451	6	0.1644	1.5	2501	26	2293	52	2067
72P_L09 M_38 52 12	1	207	64	74	0.31	4121	4.203	4.0	0.2773	3.7	0.93	3.6065	4	0.1099	1.5	1798	27	1675	33	1578
72P_L09 M_40 61 4	1	56	28	22	0.51	1150	4.676	5.1	0.3075	4.0	0.79	3.2516	4	0.1103	3.1	1804	57	1763	43	1729
72P_L09 M_41 45 17	1	367	216	135	0.59	38391	3.757	4.0	0.2539	3.5	0.86	3.9388	3	0.1073	2.0	1755	37	1584	32	1458

72P_L09 M_44	1	64	67	11	1.04	2436	1.087	6.1	0.1193	4.2	0.69	8.3826	4	0.0661	4.4	810	93	747	32	727	29	10
72P_L09 M_45	1	108	106	110	0.98	1980	21.297	4.4	0.5959	4.0	0.93	1.6780	4	0.2592	1.6	3242	25	3152	42	3013	97	7
72P_L09 M_46	1	35	9	9	0.27	585	2.755	5.9	0.2266	4.2	0.70	4.4124	4	0.0882	4.2	1386	81	1343	44	1317	50	5
72P_L09 M_50	1	146	67	87	0.46	3930	9.757	4.2	0.4219	3.9	0.92	2.3700	4	0.1677	1.6	2535	27	2412	39	2269	75	10
72P_L09 L_161	2	172	150	27	0.87	1100	0.981	8.4	0.1144	7.6	0.90	8.7376	8	0.0622	3.6	680	77	694	42	699	50	-3
72P_L09 L_162	2	176	150	27	0.85	2334	0.935	5.7	0.1134	4.8	0.84	8.8158	5	0.0598	3.1	596	66	670	28	693	31	-16
72P_L09 L_163	2	112	91	18	0.81	3798	1.026	9.3	0.1164	8.8	0.94	8.5935	9	0.0639	3.1	739	66	717	48	710	59	4
72P_L09 L_164	2	130	132	22	1.01	1680	1.023	7.2	0.1191	6.1	0.85	8.3961	6	0.0623	3.9	684	82	715	37	725	42	-6
72P_L09 L_165	2	193	119	28	0.62	1435	0.984	5.1	0.1109	3.4	0.67	9.0156	3	0.0643	3.8	753	81	696	26	678	22	10
72P_L09 L_166	2	192	121	27	0.63	4522	0.930	8.9	0.1093	8.3	0.92	9.1472	8	0.0617	3.4	665	73	668	44	669	52	-1
72P_L09 L_168	2	218	198	36	0.91	668	1.011	7.1	0.1172	6.5	0.91	8.5346	6	0.0626	2.9	694	61	709	36	714	44	-3
72P_L09 L_169	2	145	73	20	0.50	1360	0.942	6.7	0.1097	5.3	0.79	9.1120	5	0.0623	4.2	683	89	674	33	671	34	2
72P_L09 L_170	2	99	74	15	0.75	1074	0.963	6.4	0.1114	4.3	0.68	8.9758	4	0.0627	4.7	698	100	685	32	681	28	2
72P_L09 L_171	2	112	16	39	0.14	1555	4.449	7.2	0.2962	6.6	0.92	3.3764	7	0.1090	2.8	1782	51	1722	59	1672	97	6
72P_L09 L_172	2	172	104	72	0.61	3673	4.440	7.3	0.3064	7.0	0.95	3.2637	7	0.1051	2.2	1716	40	1720	61	1723	106	0
72P_L09 L_173	2	444	855	90	1.93	2213	0.957	7.8	0.1102	7.1	0.90	9.0767	7	0.0630	3.4	708	71	682	39	674	45	5

72P_L09 L_174	2	186	174	29	0.94	8262	0.981	7.9	0.1097	6.5	0.83	9.1178	7	0.0649	4.4	771	92	694	40	671	42	13
72P_L09 L_175	2	107	161	87	1.51	3129	11.771	6.2	0.4690	5.7	0.92	2.1321	6	0.1820	2.4	2671	40	2586	58	2479	1177	
72P_L09 L_176	2	131	69	81	0.53	4813	11.436	9.9	0.4369	9.0	0.91	2.2890	9	0.1899	4.0	2741	66	2559	92	2337	17715	
72P_L09 L_177	2	102	72	15	0.71	676	0.977	6.2	0.1132	3.3	0.54	8.8318	3	0.0626	5.3	695	112	692	31	691	22	0
72P_L09 L_178	2	98	70	15	0.71	1486	0.954	8.5	0.1130	6.3	0.74	8.8532	6	0.0612	5.7	648	122	680	42	690	41	-6
72P_L09 L_179	2	39	26	5	0.66	95	0.950	9.2	0.1096	6.2	0.68	9.1261	6	0.0629	6.8	704	144	678	46	670	40	5
72P_L09 L_180	2	216	92	30	0.43	6768	0.981	6.1	0.1146	4.6	0.76	8.7245	5	0.0621	3.9	677	84	694	30	700	31	-3
72P_L09 L_181	2	157	149	71	0.95	3185	4.537	5.5	0.3034	5.0	0.90	3.2957	5	0.1084	2.4	1773	44	1738	46	1708	74	4
72P_L09 L_182	2	162	126	162	0.77	7741	20.743	8.3	0.5852	7.9	0.96	1.7087	8	0.2571	2.4	3229	38	3127	80	2970	1888	
72P_L09 L_183	2	193	102	119	0.53	3399	9.149	5.7	0.4144	5.0	0.88	2.4130	5	0.1601	2.7	2457	45	2353	52	2235	94	9
72P_L09 L_184	2	186	149	29	0.80	5258	1.008	6.0	0.1128	5.2	0.86	8.8677	5	0.0648	3.1	768	65	708	31	689	34	10
72P_L09 L_185	2	128	104	20	0.81	673	1.021	9.1	0.1170	7.4	0.81	8.5458	7	0.0633	5.4	718	114	715	47	713	50	1
72P_L09 L_188	2	201	89	43	0.44	7310	1.838	4.4	0.1720	3.6	0.81	5.8151	4	0.0775	2.6	1134	52	1059	29	1023	34	10
72P_L09 L_189	2	72	35	15	0.48	2189	1.749	6.5	0.1753	4.4	0.69	5.7031	4	0.0723	4.7	995	95	1027	42	1041	43	-5
72P_L09 L_190	2	539	267	76	0.50	24647	0.890	5.1	0.1066	4.7	0.92	9.3797	5	0.0606	1.9	624	42	647	24	653	29	-5
72P_L09 L_191	2	500	234	68	0.47	4100	0.888	5.4	0.1042	4.8	0.89	9.5929	5	0.0618	2.4	668	52	646	26	639	29	4

72P_L09 L_192	2	394	412	67	1.04	3160	0.973	4.6	0.1121	4.1	0.89	8.9208	4	0.0630	2.1	707	45	690	23	685	27	3
72P_L09 L_193	2	122	79	18	0.64	17995	1.024	6.1	0.1175	4.2	0.69	8.5070	4	0.0632	4.4	714	94	716	31	716	29	0
72P_L09 L_194	2	137	63	54	0.46	8961	4.269	4.9	0.3045	4.2	0.86	3.2843	4	0.1017	2.5	1655	47	1687	40	1713	63	-4
72P_L09 L_195	2	110	51	44	0.47	1380	4.501	5.6	0.3188	4.6	0.82	3.1365	5	0.1024	3.2	1668	59	1731	46	1784	71	-7
72P_L09 L_197	2	236	236	39	1.00	3404	1.023	5.0	0.1193	4.0	0.81	8.3832	4	0.0622	2.9	680	63	715	26	726	28	-7
72P_L09 L_198	2	72	43	32	0.59	3250	5.314	4.9	0.3383	4.1	0.84	2.9562	4	0.1139	2.7	1863	48	1871	42	1878	67	-1
72P_L09 L_199	2	93	92	44	0.99	29267	5.062	5.3	0.3366	4.7	0.89	2.9705	5	0.1091	2.4	1784	44	1830	45	1871	76	-5
72P_L09 L_200	2	22	7	8	0.31	575	4.675	6.5	0.3081	4.5	0.70	3.2458	5	0.1100	4.6	1800	84	1763	54	1731	69	4
72P_L09 L_201	2	245	98	85	0.40	75665	3.956	3.4	0.2728	3.0	0.87	3.6658	3	0.1052	1.7	1717	31	1625	28	1555	41	9
72P_L09 L_203	2	96	42	39	0.44	3639	4.577	4.7	0.3300	4.2	0.89	3.0306	4	0.1006	2.1	1635	40	1745	39	1838	67	-12
72P_L09 L_204	2	211	119	32	0.56	3065	1.077	6.3	0.1213	5.6	0.89	8.2452	6	0.0644	2.8	755	59	742	33	738	39	2
72P_L09 L_205	2	493	379	78	0.77	23361	0.938	6.2	0.1141	5.6	0.91	8.7614	6	0.0596	2.6	590	56	672	30	697	37	-18
72P_L09 L_206	2	155	119	23	0.77	1648	0.918	5.3	0.1110	3.6	0.68	9.0101	4	0.0600	3.9	604	84	661	26	678	23	-12
72P_L09 L_207	2	80	50	12	0.62	1394	1.061	6.8	0.1232	4.8	0.70	8.1140	5	0.0624	4.8	688	103	734	35	749	34	-9
72P_L09 L_208	2	128	56	50	0.43	21037	4.571	5.1	0.3029	4.2	0.83	3.3018	4	0.1095	2.8	1790	51	1744	42	1705	63	5
72P_L09 L_209	2	187	59	74	0.31	3239	4.607	6.0	0.3085	5.4	0.90	3.2412	5	0.1083	2.6	1771	48	1751	50	1733	81	2

72P_L09 L_210	2	213	284	37	1.33	4477	0.940	5.9	0.1086	4.3	0.74	9.2097	4	0.0628	4.0	701	85	673	29	665	27	5
72P_L09 L_211	2	303	285	49	0.94	2156	0.974	6.2	0.1138	5.2	0.84	8.7860	5	0.0621	3.3	677	71	691	31	695	34	-3
72P_L09 L_212	2	396	7	132	0.02	14193	3.901	5.4	0.2581	5.1	0.93	3.8746	5	0.1096	1.9	1793	35	1614	44	1480	67	17
72P_L09 L_213	2	160	129	25	0.81	997	1.020	5.0	0.1156	4.2	0.84	8.6471	4	0.0640	2.7	741	56	714	25	705	28	5
72P_L09 L_214	2	140	113	22	0.80	2409	1.017	5.6	0.1134	4.4	0.79	8.8169	4	0.0650	3.4	775	72	712	29	693	29	11
72P_L09 L_215	2	125	58	46	0.46	8084	4.137	5.1	0.2867	4.8	0.93	3.4883	5	0.1047	1.9	1708	35	1662	42	1625	69	5
72P_L09 L_216	2	170	71	63	0.41	152860	4.087	4.4	0.2876	3.8	0.87	3.4769	4	0.1031	2.1	1680	39	1652	36	1630	55	3
72P_L09 L_217	2	119	44	46	0.37	2598	4.442	4.5	0.3128	3.7	0.83	3.1967	4	0.1030	2.5	1678	46	1720	37	1755	57	-5
72P_L09 L_218	2	114	75	46	0.65	5644	4.308	4.0	0.3117	3.4	0.85	3.2087	3	0.1003	2.1	1629	40	1695	33	1749	52	-7
72P_L09 L_219	2	83	22	32	0.27	30569	4.795	5.4	0.3255	4.6	0.86	3.0721	5	0.1068	2.8	1746	51	1784	45	1817	73	-4
72P_L09 L_220	2	192	74	68	0.39	6992	4.018	4.4	0.2792	4.0	0.91	3.5812	4	0.1044	1.8	1703	34	1638	36	1588	56	7
72P_L09 L_221	2	128	114	121	0.89	5963	19.071	3.7	0.5913	3.3	0.90	1.6912	3	0.2339	1.6	3079	25	3045	35	2995	79	3
72P_L09 L_222	2	259	411	276	1.59	4838	18.451	6.1	0.5335	6.0	0.98	1.8744	6	0.2508	1.1	3190	17	3014	59	2756	134	14
72P_L09 L_223	2	74	54	16	0.73	3987	1.820	6.1	0.1771	5.1	0.84	5.6473	5	0.0746	3.3	1057	66	1053	40	1051	50	1
72P_L09 L_224	2	41	24	10	0.58	398	1.899	7.1	0.1930	3.9	0.54	5.1814	4	0.0714	6.0	968	122	1081	47	1138	40	-17
72P_L09 L_225	2	78	116	55	1.50	22722	9.726	5.3	0.4394	4.9	0.91	2.2757	5	0.1605	2.2	2461	37	2409	49	2348	96	5

72P_L09 L_226	2	129	120	20	0.93	602	1.025	4.9	0.1178	3.4	0.70	8.4865	3	0.0631	3.5	711	74	716	25	718	23	-1
72P_L09 L_227	2	173	158	28	0.91	718	1.000	5.6	0.1199	4.5	0.80	8.3404	4	0.0605	3.4	621	73	704	28	730	31	-18
<20% discordant																						
72P_L09 M_17	1	373	191	220	0.51	126866	7.941	5.4	0.3560	5.3	0.98	2.8087	5	0.1618	1.0	2474	17	2224	49	1963	90	21
72P_L09 M_21	1	662	564	537	0.85	32165	12.301	7.6	0.2789	7.0	0.92	3.5861	7	0.3199	2.9	3570	44	2628	71	1586	98	56
72P_L09 M_27	1	215	139	142	0.64	3652	10.982	3.7	0.4034	3.3	0.90	2.4790	3	0.1974	1.6	2805	26	2522	34	2185	62	22
72P_L09 M_33	1	656	261	309	0.40	8460	5.278	7.3	0.2434	7.1	0.98	4.1077	7	0.1572	1.6	2426	27	1865	62	1405	89	42
72P_L09 M_34	1	240	70	78	0.29	7448	3.910	3.4	0.2528	2.3	0.68	3.9553	2	0.1122	2.5	1835	46	1616	28	1453	31	21
72P_L09 M_35	1	928	176	391	0.19	5126	4.066	5.1	0.1809	4.8	0.95	5.5271	5	0.1630	1.5	2487	26	1647	41	1072	48	57
72P_L09 M_37	1	349	108	228	0.31	9400	11.399	6.2	0.3931	6.1	0.98	2.5441	6	0.2103	1.2	2908	19	2556	58	2137	11127	
72P_L09 M_43	1	517	300	395	0.58	35768	10.042	6.9	0.3338	6.8	0.98	2.9959	7	0.2182	1.4	2967	23	2439	64	1857	10937	
72P_L09 L_186	2	138	112	23	0.82	73120	1.019	6.5	0.1237	5.7	0.88	8.0858	6	0.0597	3.1	594	67	713	33	752	41	-26
72P_L09 L_187	2	932	591	412	0.63	23720	4.043	8.0	0.1954	7.5	0.94	5.1168	8	0.1500	2.8	2346	48	1643	65	1151	79	51
72P_L09 L_196	2	168	102	27	0.61	3086	1.073	10.2	0.1297	9.4	0.92	7.7117	9	0.0600	4.0	604	87	740	54	786	69	-30
72P_L09 L_202	2	482	124	298	0.26	137161	8.191	5.6	0.3515	5.4	0.96	2.8446	5	0.1690	1.5	2548	25	2252	50	1942	90	24

U Th Pb $\underline{^{206}Pb}$ $\underline{^{207}Pb}$ ±2s ^{206}Pb ±2s error ^{238}U ±2s $\underline{^{207}Pb}$ ±2s $\underline{^{207}Pb}$ ±2s $\underline{^{207}Pb}$ ±2s $\underline{^{206}Pb}$ ±2s %

Analysis	notes	ppm	ppm	ppm	Th/U	^{204}Pb	^{235}U	(%)	^{238}U	(%)	corr.	^{206}Pb	(%)	^{206}Pb	(%)	^{206}Pb	(abs)	^{235}U	(abs)	^{238}U	(abs)	disc.
73PL09																						
<20% discordant																						
73P_L09 M_51	1	172	85	100	0.50	5516	9.019	4.9	0.4180	4.8	0.96	2.3922	5	0.1565	1.4	2418	23	2340	45	2251	90	7
73P_L09 M_52	1	127	64	77	0.51	19308	9.970	5.2	0.4524	5.1	0.97	2.2103	5	0.1598	1.2	2454	21	2432	48	2406	102	2
73P_L09 M_53	1	182	88	68	0.48	3440	4.316	4.3	0.2913	4.1	0.96	3.4328	4	0.1075	1.3	1757	23	1696	35	1648	59	6
73P_L09 M_54	1	174	126	39	0.72	2074	1.783	6.0	0.1754	5.6	0.92	5.6997	6	0.0737	2.4	1033	48	1039	39	1042	53	-1
73P_L09 M_55	1	128	66	51	0.52	4898	4.677	4.7	0.3134	4.5	0.96	3.1904	4	0.1082	1.3	1770	24	1763	39	1758	69	1
73P_L09 M_58	1	205	137	130	0.67	4636	10.281	4.8	0.4177	4.6	0.97	2.3942	5	0.1785	1.1	2639	18	2460	44	2250	88	15
73P_L09 M_62	1	206	193	62	0.94	10644	2.683	2.8	0.2103	2.4	0.84	4.7544	2	0.0925	1.6	1478	30	1324	21	1231	27	17
73P_L09 M_63	1	254	82	176	0.32	395601	12.567	5.1	0.4417	4.8	0.94	2.2640	5	0.2064	1.7	2877	28	2648	48	2358	95	18
73P_L09 M_65	1	333	492	54	1.48	3060	0.915	4.6	0.1056	3.9	0.85	9.4710	4	0.0628	2.4	702	51	659	22	647	24	8
73P_L09 M_66	1	216	73	80	0.34	22459	4.403	4.9	0.2885	4.5	0.92	3.4661	5	0.1107	1.9	1810	34	1713	40	1634	65	10
73P_L09 M_68	1	183	100	139	0.55	11694	13.712	5.8	0.5057	5.6	0.96	1.9774	6	0.1967	1.6	2799	26	2730	55	2638	120	6
73P_L09 M_69	1	208	65	76	0.31	7459	4.275	4.5	0.2928	4.2	0.93	3.4156	4	0.1059	1.6	1730	30	1689	37	1655	61	4
73P_L09 M_71	1	406	200	251	0.49	24697	8.215	7.0	0.3688	6.9	0.98	2.7114	7	0.1616	1.3	2472	22	2255	64	2024	120	18

73P_L09 M_72	1	484	840	90	1.74	4590	0.957	5.2	0.1118	4.6	0.89	8.9412	5	0.0620	2.3	675	50	681	26	683	30	-1
73P_L09 M_76	1	277	360	175	1.30	9790	8.615	3.4	0.3782	3.0	0.86	2.6438	3	0.1652	1.7	2509	29	2298	31	2068	52	18
73P_L09 M_77	1	102	43	24	0.42	612	2.090	5.3	0.2009	4.4	0.83	4.9788	4	0.0755	3.0	1081	60	1145	37	1180	48	-9
73P_L09 M_78	1	171	98	101	0.57	54164	9.388	4.4	0.4167	4.1	0.94	2.3999	4	0.1634	1.4	2491	24	2377	40	2245	78	10
73P_L09 M_79	1	176	118	112	0.67	8360	9.486	5.8	0.4412	5.5	0.95	2.2664	5	0.1559	1.8	2412	31	2386	53	2356	1082	
73P_L09 M_82	1	154	194	147	1.26	75348	18.211	3.8	0.5451	3.7	0.97	1.8347	4	0.2423	0.9	3135	15	3001	37	2805	84	11
73P_L09 M_83	1	144	173	138	1.20	6735	18.376	4.5	0.5493	4.3	0.96	1.8206	4	0.2426	1.2	3137	19	3010	43	2822	98	10
73P_L09 M_84	1	161	125	155	0.78	6861	22.130	3.6	0.5748	3.5	0.96	1.7396	3	0.2792	1.0	3359	16	3189	35	2928	82	13
73P_L09 M_85	1	215	97	78	0.45	2129	4.043	2.9	0.2752	2.5	0.88	3.6341	3	0.1066	1.4	1741	25	1643	23	1567	35	10
73P_L09 M_86	1	156	94	104	0.60	3162	11.570	5.2	0.4522	5.0	0.97	2.2115	5	0.1856	1.2	2703	20	2570	48	2405	10111	
73P_L09 M_87	1	82	26	16	0.32	470	1.703	4.9	0.1698	3.3	0.67	5.8880	3	0.0727	3.6	1007	74	1010	31	1011	31	0
73P_L09 M_88	1	321	116	120	0.36	11168	3.972	4.1	0.2731	3.8	0.94	3.6615	4	0.1055	1.4	1723	25	1629	33	1557	53	10
73P_L09 M_89	1	156	68	22	0.44	8770	1.058	3.7	0.1169	2.4	0.64	8.5531	2	0.0656	2.8	795	59	733	19	713	16	10
73P_L09 M_91	1	236	104	151	0.44	45804	9.623	4.3	0.4330	4.1	0.95	2.3095	4	0.1612	1.4	2468	24	2399	40	2319	80	6
73P_L09 M_92	1	212	219	151	1.03	7173	9.849	3.6	0.4183	3.3	0.91	2.3906	3	0.1708	1.5	2565	25	2421	33	2253	63	12
73P_L09 M_94	1	204	85	119	0.42	9938	9.045	4.0	0.4042	3.6	0.91	2.4743	4	0.1623	1.6	2480	28	2343	36	2188	67	12

73P_L09 M_96	1	310	332	224	1.07	17574	9.213	4.0	0.3897	3.9	0.95	2.5660	4	0.1714	1.2	2572	20	2359	37	2121	70	18
73P_L09 M_97	1	109	67	42	0.62	8817	4.187	4.1	0.2887	3.3	0.82	3.4638	3	0.1052	2.4	1718	44	1672	34	1635	48	5
73P_L09 M_100	1	81	104	78	1.29	3560	18.093	3.8	0.5604	3.6	0.94	1.7843	4	0.2342	1.3	3081	21	2995	37	2868	83	7
73P_L09 M_101	1	247	142	209	0.57	22493	15.699	6.9	0.5028	6.8	0.99	1.9891	7	0.2265	1.0	3027	15	2859	66	2626	147	13
73P_L09 M_105	1	134	53	50	0.40	10868	4.276	6.4	0.2948	6.3	0.97	3.3924	6	0.1052	1.5	1718	27	1689	53	1665	92	3
73P_L09 M_107	1	192	61	117	0.32	4386	10.415	4.5	0.4328	4.4	0.97	2.3106	4	0.1745	1.1	2602	18	2472	42	2318	86	11
73P_L09 M_108	1	235	123	61	0.52	3574	2.201	3.5	0.1953	3.0	0.87	5.1203	3	0.0817	1.7	1239	34	1181	24	1150	32	7
73P_L09 M_110	1	632	252	86	0.40	10390	0.930	4.0	0.1051	3.5	0.87	9.5192	3	0.0642	1.9	748	41	667	19	644	21	14
73P_L09 M_111	1	121	43	66	0.35	3895	9.048	4.0	0.4103	3.7	0.91	2.4372	4	0.1599	1.7	2455	28	2343	37	2216	69	10
73P_L09 M_112	1	42	25	8	0.59	213	1.236	8.2	0.1409	6.4	0.78	7.0975	6	0.0636	5.1	729	108	817	46	850	51	-16
73P_L09 M_113	1	83	30	32	0.37	43476	4.512	4.1	0.3078	3.5	0.86	3.2485	4	0.1063	2.1	1737	38	1733	34	1730	53	0
73P_L09 M_114	1	567	330	82	0.58	83813	0.900	3.8	0.1054	3.0	0.80	9.4894	3	0.0620	2.3	673	49	652	18	646	19	4
73P_L09 M_115	1	43	21	6	0.50	16672	1.035	8.0	0.1122	4.6	0.57	8.9133	5	0.0669	6.5	835	136	721	41	685	30	18
73P_L09 M_116	1	255	247	41	0.97	12649	0.943	4.9	0.1080	3.6	0.73	9.2627	4	0.0634	3.4	720	71	675	24	661	23	8
73P_L09 M_117	1	73	80	79	1.10	37570	22.282	4.0	0.6141	3.6	0.90	1.6284	4	0.2632	1.7	3266	27	3196	39	3086	89	5
73P_L09 M_119	1	175	64	64	0.36	3453	4.143	5.8	0.2870	5.2	0.90	3.4839	5	0.1047	2.5	1709	47	1663	47	1627	75	5

73P_L09 M_120	1	144	37	18	0.26	2611	0.921	5.0	0.1077	3.7	0.75	9.2814	4	0.0620	3.3	674	71	663	24	660	23	2
73P_L09 M_121	1	175	62	64	0.35	28546	4.113	4.3	0.2843	3.7	0.85	3.5169	4	0.1049	2.2	1713	41	1657	35	1613	52	6
73P_L09 M_122	1	94	32	20	0.34	2029	1.825	5.0	0.1780	4.4	0.87	5.6167	4	0.0744	2.5	1051	50	1055	33	1056	42	0
73P_L09 M_123	1	140	57	54	0.40	3156	4.349	3.6	0.2976	2.9	0.79	3.3597	3	0.1060	2.2	1731	41	1703	30	1680	43	3
73P_L09 M_124	1	268	186	189	0.69	15837	9.858	3.9	0.4284	3.6	0.92	2.3344	4	0.1669	1.5	2527	25	2422	36	2298	69	9
73P_L09 M_125	1	276	97	61	0.35	2758	1.805	4.3	0.1744	3.3	0.78	5.7346	3	0.0751	2.7	1070	54	1047	28	1036	32	3
73P_L09 L_230	2	96	34	12	0.35	532	0.958	8.2	0.1108	5.6	0.68	9.0230	6	0.0627	6.0	697	127	682	41	678	36	3
73P_L09 L_231	2	309	205	48	0.66	16295	1.011	8.4	0.1193	7.3	0.87	8.3805	7	0.0614	4.1	655	89	709	43	727	50	-11
73P_L09 L_232	2	68	20	23	0.29	1252	4.001	7.9	0.2909	7.0	0.88	3.4375	7	0.0997	3.7	1619	69	1634	64	1646	101	-2
73P_L09 L_233	2	110	23	36	0.21	4901	3.941	7.0	0.2770	6.4	0.90	3.6096	6	0.1032	3.0	1682	56	1622	57	1576	89	6
73P_L09 L_234	2	221	127	161	0.58	11067	12.256	4.1	0.4652	3.9	0.95	2.1495	4	0.1911	1.2	2751	20	2624	38	2463	80	10
73P_L09 L_235	2	128	27	49	0.21	2988	4.870	4.4	0.3173	4.0	0.92	3.1517	4	0.1113	1.7	1821	31	1797	37	1776	62	2
73P_L09 L_236	2	94	23	36	0.24	1113	4.895	4.6	0.3210	3.8	0.83	3.1153	4	0.1106	2.5	1809	46	1801	38	1795	59	1
73P_L09 L_237	2	348	124	217	0.35	15715	9.188	5.6	0.3944	5.5	0.98	2.5352	6	0.1689	1.2	2547	21	2357	52	2143	10016	
73P_L09 L_238	2	228	181	153	0.79	246206	9.866	6.1	0.4211	5.7	0.93	2.3750	6	0.1699	2.2	2557	37	2422	56	2265	10811	
73P_L09 L_239	2	487	342	188	0.70	99195	3.542	5.9	0.2404	5.6	0.94	4.1602	6	0.1069	2.0	1747	36	1537	47	1389	69	20

73P_L09 L_240	2	48	18	19	0.37	1145	5.126	8.0	0.3338	6.7	0.83	2.9958	7	0.1114	4.5	1822	81	1840	68	1857	107	-2
73P_L09 L_242	2	86	61	22	0.71	974	1.977	10.8	0.1999	9.8	0.91	5.0024	10	0.0717	4.5	978	92	1108	73	1175	106	-20
73P_L09 L_243	2	317	93	120	0.30	4902	4.116	6.9	0.2812	6.5	0.94	3.5565	6	0.1062	2.4	1734	44	1657	56	1597	91	8
73P_L09 L_244	2	119	151	90	1.27	1863	10.923	4.2	0.4618	3.6	0.85	2.1653	4	0.1715	2.2	2573	37	2517	39	2448	73	5
73P_L09 L_246	2	148	88	20	0.59	10516	0.920	6.5	0.1089	4.0	0.62	9.1857	4	0.0613	5.1	649	109	662	32	666	26	-3
73P_L09 L_247	2	219	187	94	0.86	1955	4.378	4.1	0.2905	3.6	0.88	3.4424	4	0.1093	1.9	1788	35	1708	34	1644	52	8
73P_L09 L_248	2	157	125	37	0.80	872	1.785	5.9	0.1727	5.1	0.85	5.7915	5	0.0750	3.1	1068	62	1040	39	1027	48	4
73P_L09 L_249	2	108	51	24	0.47	24516	1.805	5.9	0.1789	4.1	0.69	5.5890	4	0.0732	4.2	1018	86	1047	38	1061	40	-4
73P_L09 L_250	2	228	154	33	0.68	1581	0.930	5.9	0.1110	4.4	0.75	9.0084	4	0.0608	3.9	631	84	668	29	679	29	-8
73P_L09 L_251	2	360	365	56	1.01	11395	0.955	5.5	0.1092	4.5	0.82	9.1555	4	0.0634	3.2	721	68	681	27	668	29	7
73P_L09 L_253	2	130	5	45	0.04	1496	4.462	4.8	0.3043	4.3	0.91	3.2861	4	0.1063	2.0	1738	37	1724	40	1713	65	1
73P_L09 L_254	2	95	210	87	2.21	2221	10.775	4.8	0.4840	4.3	0.90	2.0662	4	0.1615	2.1	2471	36	2504	44	2545	90	-3
73P_L09 L_255	2	137	293	116	2.13	6239	10.584	3.8	0.4527	3.5	0.90	2.2089	3	0.1696	1.7	2553	28	2487	36	2407	70	6
73P_L09 L_256	2	161	142	24	0.88	934	1.001	6.2	0.1142	5.0	0.81	8.7550	5	0.0636	3.6	728	77	704	31	697	33	4
73P_L09 L_257	2	142	130	21	0.92	7238	0.939	5.7	0.1136	4.3	0.76	8.7997	4	0.0599	3.6	600	79	672	28	694	28	-16
73P_L09 L_258	2	276	325	192	1.18	94779	9.387	5.5	0.4017	5.3	0.98	2.4892	5	0.1695	1.2	2552	20	2377	50	2177	98	15

>20% discordant

73P_L09 M_60	1	429	143	195	0.33	6898	6.477	4.6	0.2868	4.4	0.95	3.4870	4	0.1638	1.4	2495	23	2043	40	1625	63	35
73P_L09 M_61	1	431	540	110	1.25	19760	2.079	5.5	0.1632	5.3	0.97	6.1283	5	0.0924	1.2	1476	23	1142	37	974	48	34
73P_L09 M_64	1	556	362	336	0.65	10444	6.756	4.7	0.2973	4.6	0.98	3.3636	5	0.1648	0.9	2506	15	2080	42	1678	68	33
73P_L09 M_67	1	383	272	281	0.71	40760	10.707	5.6	0.3873	5.4	0.96	2.5823	5	0.2005	1.6	2830	26	2498	52	2110	96	25
73P_L09 M_70	1	563	118	172	0.21	8870	3.091	3.7	0.2176	3.5	0.94	4.5955	3	0.1030	1.3	1679	24	1430	28	1269	40	24
73P_L09 M_73	1	3392422056157816			0.06	7660	1.327	6.6	0.1552	6.1	0.92	6.4426	6	0.0620	2.6	674	55	857	38	930	53	-38
73P_L09 M_74	1	751465828		14933	0.08	1932	1.636	9.0	0.1862	8.4	0.93	5.3691	8	0.0637	3.4	732	72	984	57	1101	85	-50
73P_L09 M_80	1	736	93	434	0.13	48051	6.778	11.1	0.2493	11.0	0.99	4.0118	11	0.1972	1.6	2803	26	2083	98	1435	141	49
73P_L09 M_90	1	550	396	372	0.72	1049342	7.604	4.5	0.3219	4.4	0.98	3.1065	4	0.1713	0.9	2571	16	2185	40	1799	69	30
73P_L09 M_93	1	613	205	225	0.33	17873	3.594	5.9	0.2403	5.6	0.96	4.1622	6	0.1085	1.7	1774	30	1548	46	1388	70	22
73P_L09 M_98	1	379	113	218	0.30	5303	8.817	3.3	0.3660	3.1	0.94	2.7326	3	0.1747	1.1	2603	19	2319	30	2010	53	23
73P_L09 M_99	1	346	71	186	0.21	22294	8.732	6.5	0.3540	6.4	0.98	2.8253	6	0.1789	1.2	2643	20	2310	60	1953	108	26
73P_L09 M_103	1	259	123	73	0.48	1884	3.230	4.6	0.2169	4.4	0.95	4.6106	4	0.1080	1.4	1766	25	1464	36	1265	50	28
73P_L09 M_106	1	16	0	8	0.00	227	6.834	16.1	0.4712	14.8	0.92	2.1222	15	0.1052	6.3	1718	115	2090	143	2489	306	-45
73P_L09 M_109	1	393	392	273	1.00	13256	8.407	3.6	0.3626	3.4	0.95	2.7582	3	0.1682	1.1	2540	18	2276	32	1994	58	21

73P_L09 M_118	1	1050	76	484	0.07	7668	4.222	5.2	0.1836	4.9	0.94	5.4455	5	0.1667	1.8	2525	30	1678	43	1087	49	57
73P_L09 L_228	2	488	513	316	1.05	181216	6.692	7.1	0.2995	6.4	0.90	3.3384	6	0.1620	3.1	2477	52	2072	63	1689	95	32
73P_L09 L_229	2	543	365	357	0.67	22938	6.904	10.8	0.3287	10.4	0.96	3.0423	10	0.1523	2.9	2372	50	2099	96	1832	166	23
73P_L09 L_241	2	66	45	14	0.68	341	1.490	8.7	0.1637	6.2	0.71	6.1096	6	0.0660	6.1	808	128	926	53	977	57	-21
73P_L09 L_245	2	224	185	34	0.83	2069	0.937	5.3	0.1148	4.7	0.89	8.7080	5	0.0592	2.4	573	52	671	26	701	32	-22
73P_L09 L_252	2	131	119	21	0.91	2878	0.970	6.7	0.1185	5.4	0.80	8.4421	5	0.0594	4.0	581	87	688	34	722	37	-24

Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{235}U$	±2s (%)	$^{206}Pb/^{238}U$	±2s (%)	error corr.	$^{238}U/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (abs)	$^{207}Pb/^{235}U$	±2s (abs)	$^{206}Pb/^{238}U$	±2s (abs)	% disc.

74PL09
<20% discordant

74P_L09 M_126	1	219	200	52	0.91	9920	1.757	4.2	0.1746	3.5	0.84	5.7281	3	0.0730	2.3	1014	46	1030	27	1037	33	-2
74P_L09 M_127	1	246	90	53	0.37	2746	1.837	3.8	0.1767	3.3	0.88	5.6585	3	0.0754	1.8	1079	37	1059	25	1049	32	3
74P_L09 M_128	1	206	66	44	0.32	15716	1.867	3.8	0.1808	3.3	0.86	5.5324	3	0.0749	1.9	1066	39	1069	25	1071	32	0
74P_L09 M_129	1	30	25	13	0.84	4389	5.174	4.5	0.3354	3.4	0.77	2.9812	3	0.1119	2.9	1830	52	1848	38	1865	56	-2
74P_L09 M_130	1	19	47	5	2.54	250	1.727	8.3	0.1707	4.9	0.59	5.8570	5	0.0734	6.7	1025	136	1019	54	1016	46	1
74P_L09 M_131	2	116	45	24	0.38	1644	1.727	5.8	0.1730	4.7	0.80	5.7810	5	0.0724	3.5	998	71	1019	37	1029	44	-3

74P_L09 M_132	2	155	66	32	0.43	21903	1.752	4.4	0.1695	3.6	0.81	5.8988	4	0.0749	2.5	1067	51	1028	28	1010	33	5
74P_L09 M_133	2	77	66	12	0.85	980	1.020	6.5	0.1164	4.8	0.75	8.5942	5	0.0636	4.3	728	91	714	33	710	32	3
74P_L09 M_134	2	19	10	5	0.51	646	2.109	7.9	0.1968	4.3	0.55	5.0820	4	0.0777	6.6	1140	131	1152	54	1158	46	-2
74P_L09 M_135	2	12	5	3	0.42	106	2.023	9.6	0.1913	4.5	0.47	5.2273	5	0.0767	8.4	1113	168	1123	65	1128	47	-1
74P_L09 M_136	2	90	39	18	0.43	3607	1.699	4.3	0.1663	3.1	0.72	6.0141	3	0.0741	3.0	1045	60	1008	27	992	28	5
74P_L09 M_137	2	438	105	87	0.24	4167	1.668	3.7	0.1587	3.2	0.88	6.2995	3	0.0762	1.7	1101	35	997	23	950	29	14
74P_L09 M_138	2	227	52	56	0.23	2369	2.368	2.7	0.2032	2.4	0.90	4.9206	2	0.0845	1.1	1304	22	1233	19	1193	27	9
74P_L09 M_141	2	188	69	38	0.37	1826	1.726	4.7	0.1682	4.3	0.92	5.9452	4	0.0744	1.8	1052	37	1018	30	1002	40	5
74P_L09 M_142	2	106	135	44	1.27	1320	3.961	3.3	0.2825	2.7	0.82	3.5399	3	0.1017	1.9	1655	35	1626	27	1604	38	3
74P_L09 M_144	2	153	68	59	0.45	10585	4.357	4.1	0.3032	3.6	0.87	3.2986	4	0.1042	2.0	1701	37	1704	34	1707	53	0
74P_L09 M_148	2	246	142	97	0.58	23370	4.111	4.0	0.2773	3.6	0.91	3.6056	4	0.1075	1.7	1758	30	1657	32	1578	51	10
74P_L09 M_151	2	264	76	54	0.29	4950	1.695	4.5	0.1663	4.0	0.89	6.0124	4	0.0739	2.1	1039	42	1007	29	992	37	5
74P_L09 M_152	2	385	89	231	0.23	1698666	8.744	4.5	0.3740	4.3	0.96	2.6737	4	0.1696	1.3	2553	22	2312	41	2048	76	20
74P_L09 M_154	2	322	167	71	0.52	13177	1.680	4.3	0.1609	3.6	0.83	6.2146	4	0.0757	2.4	1088	48	1001	28	962	32	12
74P_L09 M_155	2	77	20	15	0.26	1858	1.809	4.8	0.1696	3.3	0.70	5.8965	3	0.0774	3.4	1131	68	1049	31	1010	31	11
74P_L09 M_156	2	268	171	40	0.64	4433	0.944	3.6	0.1116	2.3	0.65	8.9573	2	0.0613	2.7	651	59	675	18	682	15	-5

Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	^{206}Pb/^{204}Pb	^{207}Pb/^{235}U	±2s (%)	^{206}Pb/^{238}U	±2s (%)	error corr.	^{238}U/^{206}Pb	±2s (%)	^{207}Pb/^{206}Pb	±2s (%)	^{207}Pb/^{206}Pb	±2s (abs)	^{207}Pb/^{235}U	±2s (abs)	^{206}Pb/^{238}U	±2s (abs)	% disc.
74P_L09 M_157	2	119	69	76	0.58	8543	10.321	3.3	0.4479	3.0	0.90	2.2324	3	0.1671	1.4	2529	24	2464	31	2386	59	6
74P_L09 M_158	2	211	62	72	0.29	28044	3.889	5.9	0.2703	5.6	0.95	3.6990	6	0.1043	1.8	1703	33	1611	47	1543	77	9
74P_L09 M_159	2	212	154	148	0.73	6369	9.796	4.4	0.4240	4.0	0.92	2.3588	4	0.1676	1.7	2534	29	2416	41	2278	78	10
74P_L09 L_259	2	208	164	251	0.79	28756	28.490	11.5	0.6412	10.5	0.91	1.5595	10	0.3222	4.8	3581	74	3436	113	3194	264	11
74P_L09 L_260	2	165	114	182	0.69	64929	28.682	8.0	0.6188	7.7	0.96	1.6160	8	0.3362	2.3	3645	35	3443	78	3105	189	15
74P_L09 L_261	2	126	47	46	0.37	11154	4.273	7.2	0.2953	6.6	0.92	3.3859	7	0.1049	2.9	1713	53	1688	59	1668	97	3
74P_L09 L_262	2	159	36	56	0.23	3039	4.045	6.0	0.2899	5.3	0.88	3.4500	5	0.1012	2.9	1646	53	1643	49	1641	77	0
74P_L09 L_263	2	168	123	108	0.73	25288	9.918	8.0	0.4267	7.2	0.89	2.3436	7	0.1686	3.6	2544	60	2427	74	2291	138	10
74P_L09 L_264	2	133	106	89	0.79	4055	10.540	7.4	0.4416	6.8	0.93	2.2645	7	0.1731	2.8	2588	46	2483	68	2358	135	9
74P_L09 L_265	2	165	101	106	0.62	61406	10.292	6.4	0.4466	5.7	0.89	2.2390	6	0.1671	2.9	2529	49	2461	59	2380	114	6
74P_L09 L_266	2	159	178	104	1.12	2438	10.005	6.8	0.4224	6.3	0.93	2.3674	6	0.1718	2.5	2575	42	2435	62	2271	120	12
<20% discordant																						
74P_L09 M_145	2	366	270	382	0.74	10156	20.434	6.9	0.4727	6.6	0.96	2.1157	7	0.3135	2.0	3538	31	3112	67	2495	137	29
74P_L09 M_153	2	272	105	233	0.39	12735	18.727	6.8	0.4898	6.7	0.98	2.0415	7	0.2773	1.3	3348	21	3028	66	2570	141	23

NFH
<20% discordant

NFH S 149 16	1	82	164	55	2.00	1714	9.603	6.4	0.4022	5.7	0.90	2.4865	6	0.1732	2.8	2589	47	2397	59	2179	105
NFH S 157 9	1	64	29	23	0.45	1923	4.440	6.0	0.2907	5.4	0.90	3.4401	5	0.1108	2.5	1812	46	1720	49	1645	78
NFH S 160 16	1	105	85	31	0.81	7546	2.692	5.6	0.2111	4.7	0.85	4.7363	5	0.0925	2.9	1477	56	1326	41	1235	53
NFH S 161 2	1	66	68	10	1.04	188	0.940	6.7	0.1094	4.4	0.66	9.1379	4	0.0623	5.1	683	109	673	33	669	28
NFH S 162 13	1	256	179	34	0.70	6094	0.853	5.4	0.0986	4.5	0.82	10.1443	4	0.0627	3.1	699	65	626	25	606	26
NFH S 165 18	1	174	92	22	0.53	4668	0.916	5.8	0.1026	4.9	0.85	9.7431	5	0.0648	3.1	767	65	660	28	630	29
NFH S 166 11	1	142	143	22	1.00	1525	0.941	8.3	0.1068	7.0	0.85	9.3591	7	0.0638	4.4	736	93	673	41	654	44
NFH S 167 14	1	188	120	25	0.64	953	0.900	5.9	0.1026	4.4	0.75	9.7500	4	0.0636	3.9	729	82	651	28	629	27
NFH S 171 12	1	183	100	112	0.55	10908	8.969	13.7	0.4023	12.2	0.89	2.4858	12	0.1617	6.1	2473	103	2335	125	2180	226
NFH S 172 13	1	153	99	21	0.65	302	0.974	8.1	0.1092	7.1	0.88	9.1548	7	0.0647	3.8	765	80	691	40	668	45
NFH S 173 20	1	230	114	27	0.50	1015	0.837	6.1	0.0953	5.0	0.82	10.4966	5	0.0637	3.5	732	75	617	28	587	28
NFH S 174 15	1	282	183	39	0.65	923	0.910	8.1	0.1030	7.4	0.92	9.7100	7	0.0641	3.2	744	67	657	39	632	45
NFH S 175 16	1	180	156	25	0.87	3652	0.880	8.6	0.1000	7.2	0.84	10.0024	7	0.0638	4.7	735	100	641	41	614	42
NFH S 177 8	1	115	37	42	0.32	4480	4.453	9.5	0.2931	8.5	0.89	3.4121	8	0.1102	4.4	1803	80	1722	79	1657	124

NFH S 178 8	1	199	119	29	0.60	1139	0.990	10.1	0.1121	9.0	0.89	8.9242	9	0.0641	4.6	743	98	699	51	685	59
NFH S 179 12	1	190	266	81	1.40	9473	3.624	6.0	0.2560	5.4	0.90	3.9064	5	0.1027	2.6	1673	48	1555	48	1469	71
NFH S 180 20	1	355	146	45	0.41	2942	0.900	8.3	0.1004	7.1	0.85	9.9602	7	0.0650	4.3	774	91	652	40	617	41
NFH S 182 4	1	136	52	49	0.39	2285	4.004	8.7	0.2829	7.3	0.84	3.5352	7	0.1026	4.7	1673	87	1635	71	1606	104
NFH S 185 -11	1	356	230	53	0.65	7668	0.957	9.3	0.1143	8.7	0.94	8.7485	9	0.0607	3.3	630	70	682	46	698	57
NFH S 186 0	1	258	327	56	1.27	3445	1.385	17.3	0.1469	15.7	0.91	6.8085	16	0.0684	7.3	880	151	883	102	883	130
NFH S 187 11	1	177	105	24	0.59	1767	0.917	10.0	0.1049	8.0	0.80	9.5309	8	0.0634	6.1	721	129	661	49	643	49
NFH S 191 3	1	260	247	41	0.95	2981	0.926	8.1	0.1080	6.6	0.83	9.2628	7	0.0622	4.5	682	97	666	39	661	42
NFH S 192 7	1	795	823	127	1.03	16939	0.826	9.9	0.0979	9.1	0.92	10.2184	9	0.0612	3.9	647	84	611	46	602	52
NFH S 195 15	1	213	87	72	0.41	3209	3.602	7.8	0.2513	6.6	0.85	3.9797	7	0.1040	4.2	1696	77	1550	62	1445	86
NFH S 196 9	1	169	135	61	0.80	1240	3.354	8.0	0.2497	6.4	0.80	4.0048	6	0.0974	4.8	1575	89	1494	63	1437	83
NFH S 197 -6	1	210	166	33	0.79	1213	1.073	14.9	0.1234	14.0	0.94	8.1041	14	0.0631	5.1	710	108	740	78	750	99
NFH S 198 7	1	168	133	67	0.79	1064	4.065	10.8	0.2801	9.7	0.89	3.5707	10	0.1053	4.9	1719	89	1647	88	1592	136
NFH S 199 8	1	372	286	60	0.77	3381	1.133	12.7	0.1240	12.1	0.95	8.0672	12	0.0663	4.0	815	83	769	68	753	86
NFH S 201 16	1	217	120	131	0.55	2465	8.840	8.9	0.3888	7.8	0.87	2.5721	8	0.1649	4.4	2507	74	2322	81	2117	140
NFH S 203 -2	1	188	78	76	0.41	3773	4.494	8.6	0.3104	8.1	0.93	3.2220	8	0.1050	3.1	1715	57	1730	72	1743	123

NFH S 206 0	1	216	263	36	1.22	429	0.959	13.2	0.1116	11.1	0.84	8.9607	11	0.0623	7.2	684	153	683	65	682	72
NFH S 207 13	1	602	803	99	1.33	14892	0.894	6.3	0.1024	5.4	0.85	9.7700	5	0.0634	3.4	721	72	649	30	628	32
NFH S 208 11	1	130	202	23	1.56	225	1.008	7.0	0.1125	5.2	0.74	8.8896	5	0.0650	4.7	773	99	708	36	687	34
NFH S 210 20	1	253	209	33	0.82	1095	0.852	11.0	0.0965	9.1	0.83	10.3672	9	0.0640	6.2	743	131	626	52	594	52
NFH L 211 2	1	90	66	13	0.74	285	0.971	8.9	0.1123	6.0	0.68	8.9085	6	0.0627	6.5	699	139	689	44	686	39
NFH L 212 0	1	121	51	17	0.43	518	1.013	9.1	0.1167	6.7	0.74	8.5703	7	0.0630	6.1	708	130	711	46	711	45
NFH L 214 -9	1	238	196	36	0.82	548	1.008	10.1	0.1185	9.0	0.89	8.4418	9	0.0617	4.6	665	99	708	52	722	62
NFH L 217 -6	1	216	213	35	0.99	3188	1.004	7.9	0.1175	6.2	0.78	8.5120	6	0.0620	4.9	674	106	706	40	716	42
NFH L 219 12	1	855	523	118	0.61	35270	0.831	10.6	0.0970	9.8	0.92	10.3042	10	0.0621	4.2	678	90	614	49	597	56
NFH L 222 14	1	157	111	93	0.71	2381	8.918	5.3	0.3943	5.0	0.94	2.5362	5	0.1640	1.9	2498	31	2330	48	2143	90
NFH L 224 6	1	132	97	19	0.74	384	1.036	7.4	0.1165	5.4	0.73	8.5837	5	0.0645	5.0	758	106	722	38	710	36
NFH L 226 14	1	207	171	27	0.83	3290	0.879	5.1	0.1006	4.1	0.80	9.9393	4	0.0634	3.0	721	65	641	24	618	24
NFH L 228 18	1	170	110	21	0.65	638	0.915	5.2	0.1025	4.0	0.78	9.7577	4	0.0647	3.2	766	68	660	25	629	24
NFH L 229 14	1	141	134	79	0.95	4331	8.431	10.9	0.3843	10.6	0.97	2.6023	11	0.1591	2.7	2446	45	2279	99	2096	189
NFH L 232 20	1	318	300	43	0.94	878	0.888	5.3	0.0996	4.8	0.90	10.0392	5	0.0647	2.3	764	49	646	25	612	28
NFH L150 82 -5	2	104	68	45	0.65	1074	4.942	6.0	0.3329	4.7	0.78	3.0042	5	0.1077	3.7	1761	68	1810	51	1852	76

NFH L150 91 2 2	134	77	84	0.58	4030	9.768	6.5	0.4467	5.8	0.90	2.2387	6	0.1586	2.9	2441	48	2413	60	2380	116
NFH L150 1102 11	154	59	52	0.38	1204	3.947	6.9	0.2695	6.0	0.86	3.7113	6	0.1063	3.5	1736	65	1623	56	1538	82
NFH L150 1122 14	102	38	55	0.38	4116	9.439	7.8	0.4054	7.0	0.89	2.4664	7	0.1689	3.5	2546	59	2382	72	2194	129
NFH L150 1142 14	334	76	119	0.23	4202	3.847	7.3	0.2612	6.8	0.93	3.8281	7	0.1068	2.6	1746	48	1603	59	1496	91
NFH L150 1162 15	115	92	32	0.80	2015	2.585	10.4	0.2079	7.7	0.74	4.8100	8	0.0902	6.9	1430	132	1297	76	1218	85
NFH L150 1192 6	134	36	48	0.27	864	4.364	7.3	0.2927	5.5	0.76	3.4170	5	0.1081	4.7	1768	87	1706	60	1655	80
NFH L150 1242 6	236	200	79	0.85	1511	2.890	8.4	0.2327	6.7	0.80	4.2980	7	0.0901	5.0	1428	96	1379	63	1348	81
NFH L150 1262 17	125	34	39	0.27	12238	4.134	13.9	0.2665	11.2	0.81	3.7525	11	0.1125	8.2	1841	149	1661	114	1523	152
NFH L150 1302 15	164	75	63	0.46	2740	4.603	9.6	0.2857	8.2	0.85	3.4996	8	0.1168	5.0	1908	90	1750	80	1620	117
NFH L150 1322 18	284	72	93	0.26	2009	3.619	7.6	0.2468	6.7	0.88	4.0523	7	0.1064	3.6	1738	66	1554	60	1422	85
NFH L150 1392 19	574	760	89	1.32	2601	0.863	7.2	0.0977	6.6	0.91	10.2376	7	0.0641	2.9	745	62	632	34	601	38
NFH L150 1402 13	139	145	100	1.04	198416	11.754	8.3	0.4500	7.8	0.94	2.2224	8	0.1895	2.8	2737	47	2585	78	2395	157
NFH L150 1413 8	237	156	32	0.66	489	0.914	8.4	0.1054	7.1	0.85	9.4890	7	0.0629	4.5	704	95	659	41	646	44
NFH L150 1423 9	159	102	96	0.64	1303	9.185	7.9	0.4147	7.3	0.93	2.4116	7	0.1606	2.9	2462	48	2357	72	2236	139
NFH L150 1433 17	137	141	93	1.03	8380	11.279	8.2	0.4280	7.8	0.96	2.3366	8	0.1911	2.4	2752	39	2547	76	2297	151
NFH L150 1473 9	158	81	56	0.51	4548	3.959	7.1	0.2729	6.0	0.85	3.6643	6	0.1052	3.7	1718	68	1626	57	1556	83

NFH L150 1513 20	186	213	28	1.15	1028	0.958	8.7	0.1054	6.1	0.69	9.4862	6	0.0659	6.3	803	132	682	43	646	37
NFH L150 1523 2	60	59	26	0.99	990	4.795	8.4	0.3146	6.8	0.81	3.1783	7	0.1105	5.0	1808	91	1784	71	1763	105
NFH L150 1573 5	93	40	34	0.43	556	4.425	6.1	0.2967	4.9	0.81	3.3707	5	0.1082	3.6	1769	66	1717	51	1675	73
NFH L150 1583 16	156	80	89	0.52	2799	9.380	6.2	0.3965	5.6	0.90	2.5221	6	0.1716	2.7	2573	44	2376	57	2153	103
NFH L150 1653 16	276	203	107	0.73	33866	3.861	6.8	0.2590	6.4	0.93	3.8611	6	0.1081	2.4	1768	44	1606	55	1485	84
NFH L150 1683 14	53	52	16	0.98	221	2.732	9.6	0.2157	7.0	0.73	4.6361	7	0.0919	6.5	1464	124	1337	71	1259	80
NFH L150 1763 13	154	81	90	0.53	3152	9.684	9.5	0.4136	9.0	0.95	2.4177	9	0.1698	3.0	2556	51	2405	87	2231	170
NFH L150 1833 12	134	84	83	0.63	1301	9.748	8.1	0.4178	7.1	0.87	2.3937	7	0.1692	4.0	2550	66	2411	75	2250	135
NFH L150 1843 12	165	84	96	0.51	9702	9.164	6.6	0.4050	5.6	0.85	2.4693	6	0.1641	3.6	2499	60	2355	61	2192	104
NFH L150 1863 9	183	86	111	0.47	20730	9.481	6.3	0.4221	5.6	0.90	2.3692	6	0.1629	2.8	2486	47	2386	57	2270	107
NFH L150 1873 19	337	216	115	0.64	1663	3.347	6.9	0.2346	6.1	0.88	4.2623	6	0.1035	3.3	1687	60	1492	54	1359	74
NFH S150 2914 8	139	95	54	0.68	1817	4.229	8.1	0.2856	7.0	0.87	3.5013	7	0.1074	4.0	1756	74	1680	67	1620	101
NFH S150 3044 -5	278	307	44	1.11	329	0.972	6.5	0.1143	5.2	0.79	8.7484	5	0.0617	4.0	662	85	689	33	698	34
NFH S150 3064 3	169	94	68	0.56	1736	4.630	6.1	0.3084	5.3	0.86	3.2424	5	0.1089	3.2	1781	58	1755	51	1733	80
NFH S150 3074 13	204	179	125	0.88	3996	8.029	5.1	0.3786	4.5	0.88	2.6410	4	0.1538	2.5	2388	42	2234	46	2070	80
NFH S150 3084 19	104	110	16	1.05	111	1.135	7.8	0.1191	4.7	0.60	8.3935	5	0.0691	6.2	901	129	770	42	726	32

NFH S150 3104 20	186	89	95	0.48	1852	7.631	6.7	0.3508	6.3	0.94	2.8507	6	0.1578	2.3	2432	38	2189	60	1938	106
NFH S150 3154 13	96	85	43	0.89	2578	5.097	8.1	0.3052	6.3	0.78	3.2767	6	0.1211	5.1	1973	92	1836	69	1717	95
NFH S150 3184 17	266	176	37	0.66	1327	0.979	6.9	0.1080	5.7	0.83	9.2570	6	0.0657	3.9	797	81	693	35	661	36
NFH S150 3254 13	426	512	77	1.20	1213	1.064	9.7	0.1165	8.4	0.87	8.5802	8	0.0662	4.8	813	100	736	51	711	57
NFH S150 3294 -6	234	173	39	0.74	3180	1.146	7.9	0.1299	7.0	0.89	7.6964	7	0.0640	3.6	742	76	776	43	787	52
NFH S150 3314 -7	162	120	24	0.74	908	1.035	7.7	0.1206	4.6	0.60	8.2919	5	0.0623	6.2	683	132	722	40	734	32
NFH S150 3384 6	84	123	30	1.47	4662	2.907	8.0	0.2331	6.1	0.76	4.2895	6	0.0904	5.2	1435	99	1384	61	1351	74
NFH S150 3394 18	352	358	56	1.02	705	1.008	7.0	0.1102	5.9	0.83	9.0774	6	0.0664	3.9	818	81	708	36	674	38
NFH S150 3404 7	91	47	36	0.52	1232	4.909	6.4	0.3100	4.8	0.75	3.2254	5	0.1148	4.2	1877	76	1804	54	1741	73
NFH S150 3434 9	78	31	28	0.40	375	4.562	6.9	0.2960	5.2	0.75	3.3789	5	0.1118	4.6	1829	83	1742	57	1671	76
NFH S150 3444 3	59	46	19	0.77	910	3.094	6.8	0.2452	5.4	0.79	4.0787	5	0.0915	4.1	1458	79	1431	52	1414	68
NFH S150 3454 19	307	207	96	0.67	807	2.726	7.0	0.2099	6.6	0.94	4.7640	7	0.0942	2.4	1512	46	1336	52	1228	74
NFH S150 3474 13	313	288	45	0.92	7752	0.905	6.5	0.1033	4.5	0.69	9.6793	4	0.0635	4.7	725	99	654	31	634	27
NFH S150 3504 10	185	82	69	0.44	858	3.928	9.7	0.2711	9.2	0.95	3.6890	9	0.1051	3.0	1716	54	1619	78	1546	127
NFH S150 3544 12	66	64	23	0.98	317	3.414	10.4	0.2476	6.1	0.59	4.0393	6	0.1000	8.4	1625	156	1508	82	1426	78
NFH S150 3654 18	151	167	63	1.11	3048	4.203	7.6	0.2676	5.8	0.76	3.7369	6	0.1139	5.0	1863	90	1675	63	1529	79

NFH S150 12	3674	155	107	97	0.69	53301	9.550	6.4	0.4136	5.9	0.93	2.4180	6	0.1675	2.4	2533	40	2392	59	2231	112
NFH S150 13	3694	62	70	24	1.14	#DIV/0!	4.011	5.9	0.2691	5.0	0.85	3.7155	5	0.1081	3.1	1767	57	1636	48	1536	69
NFH S150 2	3754	57	44	22	0.77	645	3.983	8.7	0.2853	5.8	0.66	3.5045	6	0.1012	6.5	1647	120	1631	70	1618	82
NFH S150 7	3794	62	70	10	1.14	566	0.968	9.8	0.1106	5.1	0.51	9.0449	5	0.0635	8.4	724	179	687	49	676	32
NFH S150 8	3804	100	84	42	0.85	1355	4.731	7.0	0.3034	6.3	0.90	3.2957	6	0.1131	3.1	1850	56	1773	59	1708	95
NFH S150 13	3835	169	181	64	1.07	2361	3.642	6.6	0.2562	5.5	0.84	3.9033	6	0.1031	3.5	1681	65	1559	52	1470	73
NFH S150 19	3845	163	65	51	0.40	1051	3.610	7.9	0.2457	6.4	0.81	4.0700	6	0.1066	4.6	1741	84	1552	63	1416	81
NFH S150 0	3855	137	222	21	1.62	583	0.880	10.0	0.1045	6.7	0.67	9.5719	7	0.0611	7.4	644	160	641	48	641	41
NFH S150 7	3875	86	59	26	0.69	521	3.024	7.1	0.2370	4.8	0.68	4.2187	5	0.0925	5.2	1478	99	1414	54	1371	60

>20% discordant

NFH S 151 23	1	275	217	37	0.79	3132	0.861	4.6	0.0964	3.4	0.73	10.3693	3	0.0648	3.2	767	67	631	22	594	19
NFH S 154 27	1	394	336	54	0.85	3893	0.848	5.0	0.0938	4.7	0.94	10.6659	5	0.0656	1.7	794	36	624	23	578	26
NFH S 156 24	1	245	126	30	0.52	5207	0.878	5.6	0.0974	5.0	0.88	10.2635	5	0.0654	2.6	786	56	640	27	599	29
NFH S 158 32	1	242	167	33	0.69	637	0.962	6.3	0.1006	5.1	0.82	9.9372	5	0.0693	3.6	909	74	684	31	618	30
NFH S 159 21	1	283	175	35	0.62	1922	0.824	5.4	0.0939	4.0	0.74	10.6516	4	0.0637	3.6	731	77	610	25	578	22
NFH S 163 24	1	161	77	88	0.48	6401	8.471	6.2	0.3574	5.6	0.90	2.7983	6	0.1719	2.7	2576	45	2283	56	1970	95

NFH S 164 26	1	277	190	98	0.68	22991	3.416	4.8	0.2278	4.5	0.95	4.3907	5	0.1088	1.5	1779	27	1508	38	1323	54
NFH S 168 22	1	256	242	36	0.94	3084	0.890	6.6	0.0989	5.8	0.89	10.1094	6	0.0653	3.0	783	63	646	31	608	34
NFH S 169 22	1	184	128	24	0.69	273	0.859	6.9	0.0966	5.8	0.84	10.3519	6	0.0645	3.7	758	79	630	33	594	33
NFH S 170 38	1	1328	2052	218	1.55	17987	0.656	8.2	0.0741	7.6	0.93	13.4956	8	0.0642	2.9	747	62	512	33	461	34
NFH S 176 23	1	251	404	47	1.61	2194	1.301	9.8	0.1292	8.0	0.82	7.7427	8	0.0731	5.6	1016	113	846	56	783	59
NFH S 184 25	1	778	636	107	0.82	2291	0.748	10.0	0.0861	9.1	0.91	11.6152	9	0.0630	4.2	708	89	567	44	532	47
NFH S 189 32	1	255	139	37	0.55	791	1.083	12.5	0.1095	11.6	0.93	9.1332	12	0.0717	4.5	979	91	745	66	670	74
NFH S 190 33	1	262	192	38	0.73	3400	1.000	8.0	0.1029	6.4	0.80	9.7164	6	0.0704	4.8	941	98	704	40	631	38
NFH S 202 46	1	109	82	13	0.75	257	0.908	9.8	0.0898	6.5	0.66	11.1332	6	0.0733	7.3	1023	147	656	47	554	34
NFH S 204 -38	1	138	182	23	1.32	545	0.878	14.7	0.1115	9.9	0.68	8.9682	10	0.0571	10.9	495	239	640	70	681	64
NFH L 223 21	1	298	551	50	1.85	1833	0.898	4.9	0.1000	4.0	0.82	9.9962	4	0.0651	2.8	778	60	651	24	615	23
NFH L 233 23	1	264	186	34	0.70	1088	0.887	6.1	0.0985	4.9	0.81	10.1511	5	0.0653	3.6	784	76	645	29	606	29
NFH L150 86 33	2	462	179	303	0.39	12881	7.237	12.7	0.3069	12.5	0.99	3.2585	13	0.1710	1.7	2568	28	2141	113	1725	190
NFH L150 96 35	2	348	290	189	0.83	3855	6.852	5.7	0.2945	5.2	0.91	3.3951	5	0.1687	2.4	2545	40	2092	51	1664	76
NFH L150 101 34	2	621	147	189	0.24	2367	3.025	6.8	0.2015	6.5	0.95	4.9625	6	0.1089	2.1	1781	38	1414	52	1183	70
NFH L150 106 24	2	145	113	50	0.78	379	3.754	12.7	0.2418	9.2	0.73	4.1351	9	0.1126	8.7	1841	157	1583	102	1396	116

NFH	L150 1072 44	390	366	59	0.94	3254	1.224	13.9	0.1106	10.3	0.74	9.0382	10	0.0802	9.3	1202	183	811	77	676	66
NFH	L150 1182 24	483	472	72	0.98	4273	0.928	9.3	0.1014	7.7	0.82	9.8597	8	0.0664	5.3	818	110	667	45	623	46
NFH	L150 1202 35	673	517	277	0.77	171041	3.092	11.6	0.2015	11.2	0.97	4.9619	11	0.1113	3.0	1820	55	1431	89	1184	121
NFH	L150 1272 53	347	405	63	1.17	606	1.453	17.3	0.1136	7.3	0.42	8.8043	7	0.0928	15.7	1484	298	911	104	694	48
NFH	L150 1282 28	73	70	25	0.95	396	4.281	10.7	0.2507	8.4	0.78	3.9889	8	0.1238	6.7	2012	118	1690	88	1442	108
NFH	L150 1362 25	276	100	92	0.36	3795	3.927	4.9	0.2462	4.4	0.90	4.0625	4	0.1157	2.1	1891	38	1619	40	1419	56
NFH	L150 1382 61	714	1350	146	1.89	554	1.226	17.8	0.0951	8.9	0.50	10.5164	9	0.0935	15.4	1498	291	813	99	586	50
NFH	L150 1443 63	550	301	141	0.55	683	3.987	17.3	0.1634	17.1	0.99	6.1205	17	0.1770	2.9	2625	48	1632	141	976	155
NFH	L150 1553 57	779	390	372	0.50	4231	4.617	16.4	0.1915	16.0	0.98	5.2212	16	0.1748	3.5	2604	58	1752	137	1130	166
NFH	L150 1593 72	1275	366	378	0.29	3328	2.434	11.8	0.1109	11.5	0.97	9.0210	11	0.1592	2.8	2448	48	1253	85	678	74
NFH	L150 1623 71	881	485	478	0.55	11785	2.761	28.2	0.1192	28.0	0.99	8.3865	28	0.1680	3.3	2537	55	1345	210	726	192
NFH	L150 1633 44	691	323	334	0.47	7872	4.442	8.6	0.2199	8.1	0.94	4.5479	8	0.1465	3.1	2306	52	1720	71	1281	94
NFH	L150 1643 38	649	436	108	0.67	2893	1.280	13.7	0.1181	10.4	0.76	8.4678	10	0.0786	8.9	1163	177	837	78	720	71
NFH	L150 1663 50	936	143	312	0.15	24463	2.121	10.9	0.1451	10.8	0.99	6.8898	11	0.1060	1.4	1732	26	1156	75	874	88
NFH	L150 1693 92	2779	963	525	0.35	2606	0.591	47.0	0.0292	47.0	1.00	34.2101	47	0.1466	1.5	2307	25	472	177	186	86
NFH	L150 1703 21	214	256	115	1.20	1692	7.255	8.3	0.3419	7.0	0.84	2.9252	7	0.1539	4.5	2390	76	2143	74	1896	115

NFH L150 1803 24	203	115	73	0.56	869	4.274	6.9	0.2586	5.4	0.79	3.8673	5	0.1199	4.3	1954	76	1688	57	1483	72
NFH L150 1813 23	412	222	148	0.54	2214	3.534	10.3	0.2360	9.9	0.96	4.2366	10	0.1086	2.8	1776	52	1535	81	1366	122
NFH L150 1823 53	721	1836	464	2.54	2610	4.780	12.6	0.2036	12.1	0.97	4.9122	12	0.1703	3.3	2560	55	1781	106	1194	132
NFH L150 1883 47	301	148	48	0.49	568	1.401	18.0	0.1173	11.3	0.63	8.5216	11	0.0866	14.0	1351	269	889	107	715	77
NFH S150 2874 42	440	437	65	0.99	779	1.057	10.5	0.1018	8.5	0.81	9.8273	8	0.0753	6.2	1077	124	732	55	625	51
NFH S150 2904 33	227	175	30	0.77	1626	0.958	9.9	0.0996	5.1	0.52	10.0366	5	0.0697	8.5	921	174	682	49	612	30
NFH S150 2924 29	244	204	73	0.84	1636	3.009	9.1	0.2072	6.2	0.69	4.8272	6	0.1053	6.6	1720	121	1410	69	1214	69
NFH S150 2934 24	130	86	46	0.66	674	4.127	8.6	0.2543	6.4	0.74	3.9325	6	0.1177	5.8	1922	103	1660	70	1461	83
NFH S150 2944 28	256	178	129	0.70	1441	6.416	9.0	0.3035	8.5	0.95	3.2949	8	0.1533	2.9	2383	49	2034	79	1709	127
NFH S150 2964 39	374	485	126	1.30	4007	2.884	10.7	0.1876	10.1	0.94	5.3314	10	0.1115	3.5	1824	64	1378	81	1108	103
NFH S150 2974 51	351	221	83	0.63	317	2.607	27.5	0.1587	15.9	0.58	6.3001	16	0.1191	22.5	1943	402	1303	202	950	140
NFH S150 2994 25	106	84	36	0.79	738	3.769	9.4	0.2415	4.8	0.51	4.1401	5	0.1132	8.1	1851	146	1586	76	1395	61
NFH S150 3004 36	136	172	22	1.27	29227	1.119	15.2	0.1096	4.7	0.31	9.1239	5	0.0741	14.4	1043	291	763	81	670	30
NFH S150 3014 47	63	73	11	1.14	391	1.444	17.8	0.1192	5.3	0.30	8.3875	5	0.0878	17.0	1379	326	907	107	726	36
NFH S150 3054 53	249	212	54	0.85	330	2.137	18.0	0.1412	17.0	0.94	7.0816	17	0.1097	6.1	1795	112	1161	125	852	135
NFH S150 3114 21	248	138	147	0.56	0	7.914	6.3	0.3537	6.1	0.96	2.8276	6	0.1623	1.8	2480	30	2221	57	1952	102

NFH S150 3134 46	101	131	21	1.29	202	1.562	19.3	0.1266	9.3	0.48	7.8997	9	0.0895	16.9	1414	324	955	120	768	67
NFH S150 3144 40	221	169	35	0.76	722	1.234	16.3	0.1136	6.8	0.42	8.8013	7	0.0787	14.8	1166	294	816	91	694	45
NFH S150 3164 39	240	191	39	0.80	537	1.251	18.3	0.1159	9.3	0.51	8.6265	9	0.0783	15.8	1154	313	824	103	707	62
NFH S150 3194 39	325	455	56	1.40	460	1.078	12.9	0.1050	7.7	0.60	9.5203	8	0.0744	10.4	1052	209	742	68	644	47
NFH S150 3204 26	311	222	109	0.71	12586	3.382	9.7	0.2262	9.4	0.96	4.4208	9	0.1084	2.7	1773	49	1500	76	1315	111
NFH S150 3274 27	135	106	13	0.79	419	0.686	10.7	0.0801	7.2	0.67	12.4922	7	0.0621	8.0	678	170	530	44	496	34
NFH S150 3284 22	144	126	22	0.88	3955	1.121	13.1	0.1168	3.6	0.27	8.5634	4	0.0696	12.6	917	260	763	70	712	24
NFH S150 3324 46	152	114	28	0.75	894	1.610	19.0	0.1289	5.5	0.29	7.7570	6	0.0906	18.2	1438	347	974	119	782	41
NFH S150 3334 39	383	206	62	0.54	926	1.304	18.2	0.1186	9.2	0.50	8.4295	9	0.0797	15.7	1190	310	848	105	723	63
NFH S150 3354 21	275	206	39	0.75	943	0.981	8.1	0.1069	4.6	0.57	9.3561	5	0.0666	6.7	825	139	694	41	655	29
NFH S150 3364 65	433	407	66	0.94	242	1.384	10.5	0.0961	5.4	0.52	10.4066	5	0.1045	9.0	1705	166	882	62	591	31
NFH S150 3424 67	161	113	29	0.70	2550	2.193	9.9	0.1169	3.0	0.30	8.5515	3	0.1360	9.5	2177	165	1179	69	713	20
NFH S150 3464 66	229	219	79	0.96	110	5.158	16.9	0.1705	4.9	0.29	5.8643	5	0.2194	16.2	2976	261	1846	144	1015	46
NFH S150 3484 77	253	268	33	1.06	960	1.327	7.1	0.0755	3.8	0.53	13.2368	4	0.1274	6.1	2062	107	858	41	469	17
NFH S150 3494 26	321	291	48	0.91	533	0.986	10.5	0.1050	9.2	0.87	9.5278	9	0.0681	5.2	873	107	697	53	643	56
NFH S150 3514 35	584	577	85	0.99	1690	0.861	6.2	0.0918	4.7	0.76	10.8891	5	0.0680	4.0	868	83	631	29	566	25

NFH	S150 3524 28	201	136	28	0.68	1078	0.991	10.2	0.1045	5.9	0.58	9.5702	6	0.0688	8.4	891	173	699	52	641	36
NFH	S150 3534 23	327	205	43	0.63	#DIV/0!	0.914	6.0	0.1008	4.8	0.80	9.9197	5	0.0658	3.6	799	76	659	29	619	28
NFH	S150 3554 74	51	3645	135	71.09	77	2.553	20.0	0.1093	9.2	0.46	9.1457	9	0.1693	17.8	2551	297	1287	146	669	59
NFH	S150 3564 65	106	111	20	1.05	98	1.874	23.9	0.1132	6.9	0.29	8.8306	7	0.1201	22.9	1957	408	1072	158	692	45
NFH	S150 3584 27	396	374	57	0.95	1809	0.927	6.9	0.1002	5.4	0.78	9.9790	5	0.0671	4.4	840	91	666	34	616	32
NFH	S150 3614 34	233	199	33	0.86	524	1.024	8.9	0.1038	5.8	0.66	9.6298	6	0.0715	6.7	972	136	716	46	637	35
NFH	S150 3624 38	337	483	63	1.43	1333	1.268	8.3	0.1177	7.2	0.87	8.4981	7	0.0782	4.0	1151	80	832	47	717	49
NFH	S150 3644 33	285	257	42	0.90	15044	1.035	7.1	0.1056	5.6	0.80	9.4734	6	0.0711	4.2	961	87	721	36	647	35
NFH	S150 3684 24	176	134	100	0.76	9889	8.288	9.6	0.3515	9.3	0.97	2.8450	9	0.1710	2.3	2568	39	2263	87	1942	156
NFH	S150 3714 23	551	911	92	1.66	#DIV/0!	0.866	6.3	0.0967	5.6	0.89	10.3365	6	0.0649	2.9	771	62	633	30	595	32
NFH	S150 3744 41	224	225	29	1.01	207737	0.912	7.3	0.0929	4.6	0.64	10.7670	5	0.0712	5.6	963	114	658	35	573	25
NFH	S150 3764 57	97	182	16	1.88	447	1.259	9.2	0.1006	5.5	0.60	9.9396	6	0.0908	7.3	1441	139	827	52	618	33
NFH	S150 3774 29	49	54	8	1.10	585	1.137	11.3	0.1146	5.9	0.52	8.7235	6	0.0720	9.7	985	197	771	61	700	39
NFH	S150 3784 22	306	375	47	1.23	1375	0.922	5.8	0.1017	4.1	0.72	9.8319	4	0.0657	4.0	798	84	663	28	624	25
NFH	S150 3825 51	192	277	33	1.44	504	1.291	15.3	0.1084	4.2	0.28	9.2273	4	0.0864	14.7	1347	284	842	87	663	27
NFH	S150 3895 55	914	873	134	0.95	11505	0.912	15.3	0.0843	14.0	0.92	11.8557	14	0.0784	6.1	1158	122	658	74	522	70

NFH	S15057	3905	131	762	40	5.82	831	1.386	19.4	0.1065	6.8	0.35	9.3880	7	0.0943	18.2	1515	344	883	115	652	42
NFH	S15026	3915	296	123	106	0.42	3049	3.750	7.9	0.2378	7.0	0.89	4.2056	7	0.1144	3.6	1870	65	1582	63	1375	87

APPENDIX 3B:

BSU LA-ICPMS notes

Isotope ratios and ages are reported without initial common Pb correction; gas blank-corrected mass 204 signals were generally irresolvable from zero.

Trace element concentrations in ppm, calculated using the mean count rate method, internal standardization to 29Si, and calibration to NIST 610 and 612 glass standards.

Ablation using a 213 nm wavelength laser, spot size of 25 microns, repetition rate of 10 Hz, and fluence of ~5 J/cm2.

Trace element concentrations were deleted from analyses known to have intersected inclusions of other minerals based on P and Ti.

65PL09

1

Experiment 2 30July13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.73% (207Pb/206Pb), 2.62% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 4 30July13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.86% (207Pb/206Pb), 3.79% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

66PL09

1

Experiment 1 30July13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.66% (207Pb/206Pb), 1.43% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 2 30July13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.73% (207Pb/206Pb), 2.62% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

3

Experiment 4 30July13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.86% (207Pb/206Pb), 3.79% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

67PL09

1

Experiment 1 20August13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.69% (207Pb/206Pb), 1.79% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 2 20August13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.71% (207Pb/206Pb), 2.37% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

3

Experiment 2 4March15

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.50% (207Pb/206Pb), 1.49% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

4

Experiment 3 4March15

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.68% (207Pb/206Pb), 1.87% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

68PL09

1

Experiment 1 20August13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.69% (207Pb/206Pb), 1.79% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 2 20August13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.71% (207Pb/206Pb), 2.37% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

72PL09

1

Experiment 1 30Dec13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.42% (207Pb/206Pb), 1.37% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 2 30Dec13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.50% (207Pb/206Pb), 1.32% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

73PL09

1

Experiment 1 30Dec13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.42% (207Pb/206Pb), 1.37% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 2 30Dec13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.50% (207Pb/206Pb), 1.32% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

74PL09

1

Experiment 1 30Dec13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.42% (207Pb/206Pb), 1.37% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 2 30Dec13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.50% (207Pb/206Pb), 1.32% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

NFH

1

Experiment 2 August13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.71% (207Pb/206Pb), 2.37% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 1 4March15

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.62% (207Pb/206Pb), 1.38% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

3

Experiment 2 4March15

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.50% (207Pb/206Pb), 1.49% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

4

Experiment 3 4 March15

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 0.68% (207Pb/206Pb), 1.87% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

5

Experiment 4 4March15

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors include systematic calibration errors of 1.70% (207Pb/206Pb), 2.92% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

APPENDIX 3C:

BSU zircon LA-ICPMS concentrations

14DS12
<10% discordant

Analysis	P	Ti	Y	Nb	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	Th	U
65P_L09 S 183	92	2.6	225	0.50	0.09	12.35		0.59	0.47	0.32	4.1	1.19	16.29	6.72	38.4	9.7	117	25.1	10546	0.22	63.5	210.9
65P_L09 S 184	104	1.2	18	0.13		8.37		0.13	0.80	0.02	0.6	0.29	1.56	0.21	1.9	0.3	2	0.8	5160	0.10	15.7	85.6
65P_L09 S 185	171	14.0	404	0.71		9.51	0.09	1.56	1.22	0.41	10.3	3.22	38.16	13.84	65.8	15.4	157	25.1	9532	0.48	66.3	98.7
65P_L09 S 187	332	9.4	980	33.22	0.02	15.28	0.12	0.84	2.78	0.23	14.2	5.73	76.97	30.39	170.5	46.3	478	82.9	10950	17.54	113.2	500.1
65P_L09 S 193	342	9.3	875	1.76	0.03	16.41	0.05	0.95	3.54	0.69	16.3	5.60	71.97	28.13	129.4	33.6	365	54.3	10546	1.56	113.4	250.8
65P_L09 S 198	180	15.1	926	6.10	2.75	18.78	1.02	9.49	9.57	2.28	30.7	9.66	99.60	34.65	132.9	29.6	290	41.9	6742	3.11	65.4	76.6
65P_L09 S 201	227	13.1	680	3.22		36.46	0.09	1.28	3.58	0.79	19.0	6.11	63.17	22.07	97.4	23.4	233	32.0	8227	1.00	149.0	227.6
65P_L09 S 202																						
65P_L09 S 203	134	29.9	338	6.62		8.76	0.16	2.47	3.86	0.56	14.1	3.99	43.27	14.36	56.9	13.1	126	15.6	6520	4.05	43.6	68.2
65P_L09 S 204																						
65P_L09 S 212																						
65P_L09 S 214	189	10.2	689	6.49	0.16	14.78	0.42	7.64	8.61	2.55	21.0	6.47	70.25	22.60	104.9	29.8	318	50.7	10593	2.91	137.1	286.5
65P_L09 S 219	115	9.2	1276	14.87		15.04	0.11	3.59	7.77	0.31	41.4	13.75	150.94	47.93	191.9	39.3	334	44.4	5504	4.06	107.9	207.5
65P_L09 S 220	668	9.1	1587	0.62		4.50	0.02	1.42	2.52	0.41	24.0	10.62	148.90	56.16	268.6	65.4	692	92.6	8870	0.69	44.2	238.8

65P_L09 S 222	179	11.3	667	3.40	0.08	7.90	0.05	0.78	1.38	0.24	14.2	5.27	64.31	25.22	111.8	27.4	260	36.1	7377	1.74	69.0	180.4
65P_L09 S 223	227	9.8	789	7.26	0.24	28.49	1.08	11.03	11.71	3.94	31.2	8.14	83.58	27.05	118.7	29.4	318	46.2	8447	2.05	247.8	265.4
65P_L09 S 224	164	6.2	877	2.40	0.05	7.17	0.04	2.10	3.24	0.29	20.4	6.89	96.51	35.26	152.5	35.8	320	49.4	6726	0.94	41.9	155.4
65P_L09 S 225	168	6.6	607	6.15	0.53	9.06	0.11	1.22	2.40	0.16	15.5	4.98	58.32	21.70	95.5	25.6	248	26.8	7777	3.48	96.8	302.5
65P_L09 S 226	186	3.3	634	0.77		3.76	0.03	0.81	2.63	0.84	13.9	4.66	64.20	23.83	105.4	28.4	355	47.0	6670	0.31	65.0	224.8
65P_L09 S 227	517	7.8	1718	6.82	0.20	15.33	0.54	10.38	22.61	8.83	117.5	38.72	282.24	64.63	214.3	40.6	367	40.2	7558	2.72	130.1	203.8
65P_L09 S 229																						
65P_L09 L 255	157	9.3	373	0.36		9.39	0.02	0.47	1.30	0.26	9.2	3.08	36.81	13.48	57.2	15.1	150	24.2	8255	0.25	50.4	158.1
65P_L09 L 256	163	10.8	827	0.28		10.06	0.21	3.41	7.63	1.38	26.1	6.90	85.19	30.21	131.1	29.3	313	41.5	8214	0.21	78.0	167.2
65P_L09 L 258	134	8.9	276	0.40		6.95	0.02	0.39	0.20	0.54	6.0	2.33	23.09	8.88	38.2	10.2	112	17.1	8454	0.29	24.7	76.5
65P_L09 L 259	197	8.7	535	0.53		7.01	0.09	1.03	2.68	0.93	12.0	3.83	47.08	16.83	81.8	19.0	214	31.9	7832	0.54	23.3	69.9
65P_L09 L 260	229	15.3	587	1.77	0.48	49.08	0.21	2.64	3.53	0.93	18.9	6.12	65.48	20.43	95.0	20.5	198	29.6	9317	0.81	193.3	168.9
65P_L09 L 261																						
65P_L09 L 262	197	4.4	370	0.86	0.10	5.46	0.01	0.33	0.89	0.37	7.3	3.01	33.33	12.91	58.3	13.8	147	24.1	13631	0.72	81.4	290.9
65P_L09 L 263	118	22.7	303	5.76		5.77	0.05	1.60	1.78	0.29	9.4	2.55	35.98	11.28	48.8	10.9	106	16.3	9117	3.37	47.6	77.0
65P_L09 L 265	143	12.0	617	0.92		45.34	0.48	8.02	12.28	3.17	37.0	7.74	67.83	21.03	79.3	16.6	162	26.7	9516	0.18	126.6	67.7
65P_L09 L 266	170	4.7	1154	1.36		8.93	0.16	2.20	6.94	0.24	27.5	9.97	106.38	40.21	182.3	39.7	338	55.5	10746	0.68	200.9	180.7

65P_L09 L 267170	5.5	605	0.98		6.75	0.03	0.86	1.87	0.06	14.5	4.87	52.04	21.37	98.2	21.1	199	32.4	10225	0.60	112.5	123.9
65P_L09 L 268130	6.3	2093	10.61	0.03	15.23	0.52	12.93	21.84	1.88	83.8	25.23	265.15	86.13	320.7	62.7	545	85.0	9277	3.82	141.8	179.1
65P_L09 L 270240	3.9	434	0.99		2.66		0.47	1.43	0.09	10.3	2.76	36.65	14.46	70.1	16.2	157	26.0	14169	0.72	40.8	200.6
65P_L09 L 274223	18.5	1922	1.92	0.09	15.65	0.70	11.45	15.36	0.67	55.5	17.00	198.79	68.01	285.1	60.3	559	79.0	10329	1.10	427.1	247.6
65P_L09 L 275157	8.3	723	3.82		5.89	0.07	0.85	3.48	0.28	14.1	5.68	70.72	25.39	118.8	27.9	285	38.2	10264	2.62	84.1	210.6
65P_L09 L 278160	15.8	299	0.68		6.99		0.01	0.40	0.28	4.9	2.02	26.37	9.98	50.4	12.9	142	20.9	10117	0.28	16.1	30.8
65P_L09 L 27992	5.3	219	0.12		6.29		0.78	1.24	0.35	3.9	1.08	16.40	6.58	34.8	9.8	118	20.2	7728	0.08	40.1	132.8
65P_L09 L 28087	7.1	160	0.13		7.59		0.52	0.55	0.50	4.2	0.99	13.60	5.08	25.9	6.4	84	14.7	7161	0.17	58.1	164.2
65P_L09 S 233216	8.2	564	0.89		13.17	0.05	1.16	2.88	0.97	12.2	4.27	52.85	20.78	97.2	23.8	278	38.4	6826	0.70	74.1	166.0
65P_L09 S 237355	13.9	593	0.83		4.91		0.68	1.89	0.36	11.8	4.40	58.03	22.50	99.4	26.4	265	35.0	7625	0.60	29.2	80.2
65P_L09 S 238327	11.4	973	0.97	0.07	18.07	0.14	2.95	8.12	1.18	30.2	8.81	103.61	35.34	147.9	36.2	364	48.2	6475	0.76	121.0	175.8
65P_L09 S 241215	6.9	1102	3.11	0.22	48.44	0.41	5.91	9.44	1.96	31.1	10.11	104.74	39.13	155.0	36.0	351	49.5	6150	1.04	331.7	392.8
65P_L09 S 243286	7.7	717	3.16	0.07	42.48	0.18	2.42	4.46	1.12	25.3	8.58	86.46	27.85	99.3	24.3	236	30.3	6674	1.17	260.5	295.8
65P_L09 S 244150	11.6	459	1.61		17.71	0.06	0.69	3.15		11.2	3.79	43.06	15.71	69.3	16.8	163	23.7	8703	0.66	199.3	287.3
65P_L09 S 246202	8.0	1084	2.38		7.29	0.13	3.57	5.64	0.49	29.6	9.92	110.08	37.59	149.2	35.3	346	42.4	6873	1.16	90.8	175.8
65P_L09 S 247204	31.1	1608	10.83	0.55	16.61	1.61	17.19	24.41	4.42	79.7	20.36	218.28	67.61	246.3	50.7	491	57.9	5898	6.12	208.1	189.8

65P_L09 S 248193	6.2	231	2.40		9.17		1.36	0.69	0.41	3.0	2.16	20.95	7.33	34.0	8.4	128	21.4	9632	0.50	66.3	540.2
65P_L09 S 249326	7.3	994	6.76	0.12	13.05	0.39	5.38	9.84	5.37	50.2	14.82	143.32	36.94	137.9	28.1	270	40.6	10194	4.04	273.3	323.9
65P_L09 S 253420	1.2	948	0.75	0.11	4.58	0.07	3.32	6.38	0.56	28.4	9.57	113.67	31.90	110.9	23.7	209	30.0	10161	0.58	67.6	198.2
65P_L09 S 182870	17.8	3496	5.61	0.14	12.39	0.67	13.26	45.64	21.28	254.9	86.04	612.17	111.84	304.5	47.2	353	49.5	11823	2.45	204.6	729.1
65P_L09 S 186167	4.0	745	6.76	0.05	19.99	0.11	1.29	2.28	0.94	14.1	5.86	68.71	24.76	113.0	27.4	308	47.5	11074	3.58	327.8	552.1
65P_L09 S 188119		474	3.96		6.02	0.06	1.53	3.07	0.49	10.2	4.00	48.41	15.78	78.2	19.2	196	36.2	12044	2.21	104.5	815.1
65P_L09 S 192487	2.8	1247	4.07		2.88		0.61	2.09	0.36	22.4	8.78	120.98	43.53	196.7	45.2	453	67.2	12357	1.67	129.4	761.9
65P_L09 S 206274	38.6	847	1.56		18.04	0.31	3.88	7.79	2.42	28.3	8.17	97.15	31.49	127.0	30.1	296	40.8	7395	0.72	25.1	41.3
65P_L09 S 216161	8.0	477	8.97	0.20	9.49	0.36	2.02	3.67	1.70	18.3	6.17	62.22	17.13	67.5	17.2	214	30.2	9277	2.06	112.4	456.4
65P_L09 L 271																					
65P_L09 L 272321	11.3	2153	3.81	0.06	36.06	0.22	5.56	12.87	2.21	64.4	20.36	218.82	72.07	304.9	66.4	580	88.4	11394	2.07	748.0	464.1
65P_L09 S 232																					
66P_L09S 103189	7.0	499	0.33		7.24			0.78	0.58	8.4	3.13	41.53	17.00	78.9	21.1	222	39.4	11064	0.49	23.6	40.5
66P_L09S 104204	15.2	851	1.48	0.04	12.86	0.21	4.33	7.14	0.93	30.9	9.27	96.36	32.24	128.2	28.0	243	37.4	9678	0.79	103.4	100.1
66P_L09S 105216	8.7	1071	4.23		13.92	0.14	2.92	5.94	0.52	31.1	10.13	113.18	41.70	162.2	35.8	347	49.5	11340	2.18	144.9	358.9
66P_L09S 106216	19.5	1467	3.34		67.18	0.35	6.63	9.88	3.09	52.4	15.41	161.19	49.48	208.5	44.5	434	63.8	11216	1.14	272.0	216.0

66P_L09S 107	135	10.9	421	2.21	0.10	67.93	0.19	2.62	3.91	0.84	16.1	4.18	42.98	12.58	51.0	12.3	112	16.7	11072	1.14	286.5	276.3
66P_L09S 108	129	37.0	444	5.28		6.28	0.25	4.70	2.73	0.48	13.7	4.63	50.86	15.61	67.0	15.1	142	21.6	8204	4.45	67.0	108.4
66P_L09S 109	78	46.0	211	1.72		3.60	0.01	0.09	0.33	0.17	5.6	1.84	20.61	7.64	31.2	7.6	74	12.1	8959	1.24	31.3	47.7
66P_L09S 110	99	46.6	1306	3.58	0.29	9.52	1.23	15.02	15.39	3.03	49.7	14.68	147.41	49.88	194.8	43.9	411	57.6	7987	2.86	256.3	235.5
66P_L09S 111	255	13.1	1165	4.04		9.35	0.15	1.75	3.33	0.32	26.9	8.75	112.92	38.41	180.8	39.7	375	59.0	10894	2.14	129.6	237.1
66P_L09S 112	131	5.3	248	0.56	0.05	5.60	0.08	0.73	0.81	0.90	8.3	2.96	28.97	7.83	34.3	7.4	82	13.7	9058	0.31	32.0	82.8
66P_L09S 113	111	39.1	430	6.20		6.34	0.11	2.20	2.89	0.67	12.7	4.69	47.08	15.58	64.6	13.8	141	21.2	9087	3.80	62.0	83.5
66P_L09S 115	254	14.3	1272	3.29		9.26	0.16	2.78	5.40	0.54	27.3	9.31	113.10	45.25	193.9	43.2	413	61.7	10943	1.64	130.1	233.4
66P_L09S 117	269	14.7	956	5.90	0.41	65.67	0.54	4.13	7.03	2.09	28.2	8.85	99.49	33.32	146.0	33.8	339	47.5	11246	2.16	404.5	453.7
66P_L09S 118	195	11.5	855	5.03	0.04	7.71	0.18	2.56	3.63	0.64	21.7	7.52	90.66	30.97	129.7	30.0	287	41.4	10851	1.71	72.7	254.8
66P_L09S 119	221	13.7	1766	1.42	0.04	29.93	0.50	8.30	13.66	5.76	51.3	14.67	163.15	59.31	261.3	66.4	776	116.7	7473	0.69	354.8	171.1
66P_L09S 120																						
66P_L09S 121																						
66P_L09S 122	596	14.7	1443	0.63	0.02	3.92	0.05	1.61	3.86	0.14	31.6	11.09	137.86	53.33	229.2	57.7	597	74.1	11029	0.54	58.8	174.9
66P_L09S 123																						
66P_L09S 124	156	27.6	848	5.69		14.68	0.33	5.14	7.94	0.91	34.5	10.13	103.83	32.66	129.9	29.5	288	34.4	8636	2.90	55.4	84.6
66P_L09S 125	77	4.0	175	2.69		14.29	0.53	4.71	3.85	1.48	9.0	1.62	18.77	4.91	25.0	7.7	110	17.9	11076	0.50	108.3	342.4

66P_L09S 127	169	3.7	1153	6.00		33.97	0.15	2.11	4.71	0.71	19.8	7.60	97.96	35.90	175.9	47.7	534	69.7	11717	2.68	261.3	520.0
66P_L09S 128	69	0.2	132	0.75		3.57					1.3	0.48	8.33	4.08	25.0	8.1	113	20.8	9842	0.27	37.0	490.2
66P_L09S 129	117	12.4	316	8.93		11.20	0.04	1.67	1.81	0.31	8.3	3.08	32.21	12.10	48.7	13.7	133	14.8	9585	5.50	70.2	182.3
66P_L09S 131	233	11.2	1285	5.84	0.12	13.12	0.04	2.34	6.90	0.37	38.3	11.41	139.54	47.88	191.0	42.4	413	44.9	9345	2.55	140.1	218.1
66P_L09S 132	198	21.6	1470	10.45	5.84	30.21	1.34	15.19	15.81	3.79	60.5	17.28	176.72	56.79	209.5	44.5	406	52.3	5878	3.56	138.0	151.5
66P_L09S 137	196	7.9	724	3.68		14.23	0.04	0.83	2.08	0.36	11.9	4.12	60.03	24.73	121.2	33.2	325	46.6	9720	1.73	70.2	216.7
66P_L09S 143	136	10.7	407	3.31		5.80		0.57	1.30	0.06	8.0	3.04	39.61	13.48	60.5	16.9	172	19.2	8334	1.44	38.9	149.8
66P_L09S 144	105	14.0	523	8.30		11.98	0.14	2.59	4.49	0.34	16.7	5.64	61.63	19.44	83.6	19.0	200	21.5	7040	4.01	69.6	137.4
66P_L09S 147																						
66P_L09S 148	233	19.9	965	3.22	0.25	59.34	0.88	13.75	17.71	5.46	51.2	14.05	140.61	39.62	149.2	37.5	437	47.4	6273	0.86	272.4	236.8
66P_L09S 149	116	10.1	439	2.84	0.06	4.66	0.02	0.55	1.61	0.13	9.2	3.32	43.39	14.28	73.0	21.8	234	22.3	7791	1.66	38.5	140.7
66P_L09S 150	101	13.9	863	16.94	0.06	18.45	0.28	5.05	7.22	1.49	31.1	8.96	98.74	36.07	128.4	27.4	230	26.1	6975	6.58	87.2	179.4
66P_L09S 151	228	3.3	901	2.57		9.55		1.40	4.61	0.18	23.4	8.38	103.44	36.72	143.2	33.3	331	39.9	8421	1.36	87.3	155.6
66P_L09 L 28	177	31.7	432	4.09	0.04	5.96	0.19	1.85	3.16	0.26	12.4	4.06	47.01	15.95	70.2	16.3	167	21.4	7626	3.18	345.3	342.0
66P_L09 L 282	106	42.1	570	5.87	0.05	6.98	0.22	3.56	5.01	0.85	20.3	6.26	67.49	23.57	90.9	21.3	209	24.5	6372	4.12	1178.9	604.9
66P_L09 L 283	112	44.8	225	1.72		3.78	0.03	1.18	1.19	0.19	7.8	2.03	26.08	8.42	36.0	8.8	93	12.4	6305	1.30	57.9	66.1

66P_L09 L 284112	47.4	268	1.96		3.81	0.06	1.25	2.69	0.42	9.7	2.70	28.26	9.25	43.8	9.4	103	12.9	6318	1.65	53.8	57.2
66P_L09 L 285199	16.8	469	1.49		12.36	0.03	1.14	3.80	0.94	15.1	4.79	56.87	18.57	72.7	16.2	159	20.8	8719	0.65	45.5	53.0
66P_L09 L 286130	17.7	294	1.22		8.34	0.04	1.26	1.94	0.65	7.4	2.55	31.35	10.16	42.2	9.8	104	14.4	7517	0.37	21.9	32.6
66P_L09 L 287274	3.6	797	5.17		26.12	0.09	1.32	2.61	0.11	22.2	5.82	80.97	27.51	119.0	27.6	238	40.2	14350	2.47	164.7	192.1
66P_L09 L 289233	23.8	629	0.95		4.77	0.07	0.87	3.56	0.12	16.2	5.56	61.95	22.32	97.0	21.3	205	31.9	10676	0.40	28.9	36.3
66P_L09 L 290256	25.9	687	1.61		3.59	0.12	1.96	4.64	0.21	19.4	6.47	75.35	24.58	100.4	24.3	224	32.9	9007	0.39	30.8	35.3
66P_L09 L 291145	32.0	223	0.25		0.35	0.04	0.31	1.79	0.34	5.7	1.63	20.12	8.02	31.5	7.3	80	13.8	8134	0.11	3.4	7.1
66P_L09 L 292152	21.1	635	10.82		14.81	0.17	2.56	5.03	0.56	20.3	6.63	68.95	23.46	106.2	22.3	205	33.8	10961	5.95	136.3	212.9
66P_L09 L 293106	13.9	528	15.56		10.79	0.03	2.76	3.91	0.37	15.4	5.38	63.88	19.93	84.2	18.8	179	26.9	9441	7.73	85.2	138.7
66P_L09 L 294135	7.7	381	1.75		22.07		0.54	1.43	0.31	7.2	2.47	32.21	11.69	62.2	16.2	164	31.2	12987	1.45	147.9	236.7
66P_L09 L 29588	0.7	159	2.74		6.25		0.33	0.22	0.02	2.7	1.11	10.10	4.42	24.0	6.8	82	16.8	13029	1.11	99.4	96.6
66P_L09 L 296139	13.6	2066	20.36	0.16	35.35	1.34	18.92	22.38	8.50	69.4	22.70	221.70	76.83	324.0	66.0	562	73.6	7705	9.34	905.4	499.5
66P_L09 L 297136	14.9	1316	20.48		17.00	0.12	2.00	4.99	2.17	24.1	8.59	113.02	43.79	201.3	42.4	373	54.9	7325	9.55	953.1	545.2
66P_L09 L 29868	23.5	336	4.93		6.55	0.12	1.65	1.89	0.61	10.9	3.25	35.52	12.08	51.3	9.9	103	16.4	8604	3.51	36.6	64.6
66P_L09 L 29987	26.3	551	8.61		7.37	0.17	2.76	3.37	0.88	13.8	5.05	56.21	20.22	85.3	18.8	164	27.0	8409	4.43	82.2	128.3
66P_L09 L 300155	28.0	492	9.81	0.04	12.46	0.10	1.23	3.09	0.52	15.0	4.94	54.57	17.66	78.5	15.9	151	22.9	10116	4.82	64.1	87.9

66P_L09 L 301181	37.5	519	5.85		11.24	0.14	2.19	4.26	0.58	18.7	5.20	59.92	19.61	79.6	16.9	153	24.0	9274	3.47	55.7	65.6
66P_L09 L 302228	44.4	714	5.43	0.08	11.30	0.37	6.05	7.53	1.81	31.9	8.22	85.80	26.46	109.0	21.0	195	27.9	8828	3.22	53.5	55.3
66P_L09 L 303126	29.1	713	3.91	0.07	8.14	0.41	6.56	9.82	1.22	28.8	8.70	90.37	27.32	108.2	22.2	195	29.3	8379	1.90	57.1	64.4
66P_L09 L 304304	12.9	1209	6.52		17.95	0.10	2.82	6.98	0.05	29.1	10.24	112.84	41.28	191.4	46.1	432	65.4	12154	1.83	135.7	116.5
66P_L09 L 305294	14.7	1098	7.76	0.09	19.36	0.14	2.54	5.22	0.24	28.5	9.30	105.56	40.29	184.9	42.6	420	62.2	12297	2.89	156.1	128.5
66P_L09 L 30786	34.6	579	2.13	0.24	6.50	0.63	9.20	8.22	2.05	27.6	7.66	77.76	24.14	95.9	21.3	210	26.5	7405	1.52	123.4	137.1
66P_L09 L 308130	49.4	585	3.72	0.17	5.84	0.65	7.08	7.79	2.04	23.9	7.16	72.96	23.76	90.8	20.3	211	28.2	6744	2.09	134.9	151.5
66P_L09 L 309113	29.3	1028	5.06	0.20	14.88	1.24	17.93	18.16	2.35	54.9	14.47	139.90	41.44	158.9	32.3	296	36.9	7349	3.21	100.2	113.7
66P_L09 L 310118	26.2	501	9.38		9.84	0.26	2.85	4.77	0.68	21.7	6.30	61.05	19.07	76.6	16.7	151	20.1	7714	5.00	54.8	73.5
66P_L09S 152206	4.9	602	3.20		6.35		1.05	2.38	0.62	13.0	4.61	58.73	21.04	90.5	20.7	230	27.8	6450	1.45	64.9	151.0
66P_L09S 153202	18.3	796	6.32	0.30	8.38	0.21	1.17	3.48	0.35	16.6	6.39	80.06	28.95	113.8	28.0	269	37.5	6905	1.88	99.5	219.3
66P_L09S 154228	11.1	577	3.14		42.49	0.03	1.96	3.59	0.93	16.6	5.16	64.72	19.05	90.8	22.1	229	26.6	6790	0.95	244.3	268.3
66P_L09S 155283	17.5	842	1.34	0.03	41.83	0.43	9.10	10.71	3.01	42.8	10.79	104.83	32.38	118.7	28.4	284	37.2	5919	0.58	357.8	290.1
66P_L09S 156454	21.9	1461	8.08	0.79	55.09	5.24	49.82	44.69	12.13	77.9	21.22	179.27	52.10	199.8	46.4	489	66.5	6949	1.54	89.6	328.4
66P_L09S 161167	8.5	716	0.93	0.06	22.28	0.16	2.72	8.72	1.82	22.9	6.00	63.41	25.83	103.1	26.0	332	40.5	6627	0.86	128.7	226.7
66P_L09S 162205	6.5	724	1.34	0.39	15.58	0.80	7.17	7.08	2.10	20.2	6.87	73.73	24.57	105.0	25.7	265	42.2	8359	0.72	70.8	247.7

66P_L09S 163139	3.3	459	0.82	0.10	8.91	0.39	4.25	4.60	1.73	11.0	4.38	41.18	14.27	61.8	15.5	197	27.0	7448	0.42	42.8	194.1
66P_L09S 164197	10.9	525	0.73		16.50	0.04	1.48	2.93	1.08	13.4	4.46	55.09	18.44	85.5	19.8	192	24.5	7377	0.64	55.6	109.9
66P_L09S 165296	22.1	987	2.95		31.06	0.05	1.01	5.02	1.18	28.6	9.46	96.69	37.45	150.3	32.0	335	45.5	8280	2.11	129.3	148.8
66P_L09S 166171	7.3	350	1.35		8.62	0.07	4.13	4.55	1.87	12.5	3.05	34.00	11.86	47.6	13.1	164	24.4	10252	0.73	51.2	274.2
66P_L09S 167220	4.8	662	0.94		12.93	0.23	4.66	5.40	2.17	23.0	5.87	62.48	25.20	103.7	25.1	274	42.1	7854	0.42	78.6	151.6
66P_L09S 170230	13.8	806	2.03		5.14		1.16	3.19	0.23	16.8	5.41	80.03	29.01	120.9	27.0	279	40.0	7197	0.96	65.5	129.5
66P_L09S 171115		104	4.80		2.14		0.28	0.32		2.8	1.32	18.48	8.54	39.3	12.0	132	18.5	10001	1.83	17.8	133.5
66P_L09S 172233	7.0	1244	2.05		25.80	0.29	4.16	10.85	0.88	44.1	11.01	130.58	45.87	189.3	44.0	428	64.1	9822	1.08	487.1	411.5
66P_L09S 173170	6.1	1601	26.04		14.25	0.24	5.29	9.47	0.69	51.1	17.92	208.33	63.90	246.6	48.9	435	55.8	6158	6.76	89.3	242.2
66P_L09S 175240	2.0	562	1.12		18.26	0.06	1.18	3.30	0.73	14.0	4.98	53.50	19.59	84.9	19.7	195	29.2	9504	0.57	146.3	131.2
66P_L09S 176349	3.7	624	0.95		10.21		2.48	3.13	0.46	20.5	6.26	68.97	22.04	94.0	20.0	193	28.7	9611	0.67	137.7	189.3
66P_L09S 177266	99.8	1025	4.65	23.94	39.60	1.74	13.08	12.01	3.57	38.1	14.26	114.74	35.74	135.5	27.0	264	45.9	8472	0.79	192.3	187.9
66P_L09S 178119	8.9	543	13.77	2.24	16.60	0.14	1.79	2.10	0.30	11.2	5.12	52.76	19.44	85.1	18.5	199	26.1	9245	9.31	95.6	206.7
66P_L09S 179266	10.5	893	1.94		20.76	0.10	1.88	7.67	0.79	25.0	9.02	85.92	31.58	129.0	27.6	265	44.3	9429	1.23	99.4	126.4

66P_L09S 134 90	19.0	644	6.27		12.86	0.13	4.13	5.27	0.72	22.9	6.67	69.24	24.25	103.9	23.0	249	30.0	8465	3.85	99.9	171.9

66P_L09S 136	77	10.0	331	9.69	0.06	10.94	0.06	1.31	1.96	0.26	8.5	3.13	32.43	12.03	50.9	12.5	142	15.3	7427	4.47	50.9	120.8
66P_L09 L 288	1013	7.9	1587	3.66		1.44		0.60	1.85	0.27	14.3	8.83	143.94	57.34	313.8	91.7	1116	169.6	11138	5.58	11.5	560.4
66P_L09 L 306	217	7.8	1486	0.88	0.00	43.73	0.46	9.03	14.63	2.53	51.7	14.39	152.64	53.14	222.8	47.6	441	65.9	11275	0.68	1189.8	959.3
66P_L09S 159	105	7.3	176	0.51		2.08					3.1	1.08	13.72	5.63	28.3	9.1	111	16.0	8052	0.94	37.4	572.4
66P_L09S 160	174	25.9	547	3.22		21.51	0.10	1.15	2.38	1.37	23.8	5.71	67.48	23.78	73.3	15.8	158	23.4	8418	0.83	144.5	522.7
66P_L09S 174	136	12.4	507	6.30		10.41	0.13	1.03	2.90	0.41	16.2	4.97	59.46	19.36	82.3	19.0	193	24.3	8435	4.23	100.0	190.7
66P_L09S 180	416	10.1	1146	2.91	0.17	10.37	0.59	7.57	9.96	2.10	31.4	9.29	120.32	42.05	177.8	40.2	411	66.3	11961	1.79	178.8	750.7

67P_L09 S 42	183	21.9	1113	6.17	0.06	16.44	0.76	12.70	21.61	1.94	60.7	17.69	169.19	49.40	166.1	38.6	384	35.0	7770	3.26	104.2	98.4
67P_L09 S 43	230	14.1	896	18.39	0.01	26.51	0.21	5.00	7.74	1.31	30.0	10.02	116.13	37.07	152.4	36.5	407	37.5	7115	9.85	188.5	277.2
67P_L09 S 44	143	8.2	946	19.01		19.48	0.24	3.55	8.40	1.31	30.7	10.64	119.32	39.48	165.8	39.4	425	39.2	5860	8.08	61.0	139.2
67P_L09 S 45																						
67P_L09 S 52																						
67P_L09 S 54	156	8.7	846	19.62	0.05	24.00	0.20	4.33	5.82	1.08	26.0	9.17	100.71	34.31	139.0	36.4	393	34.8	7899	10.86	174.4	294.8
67P_L09 S 55																						
67P_L09 S 56																						
67P_L09 S 57	191	39.3	924	4.54	0.04	14.55	0.66	11.86	16.31	2.15	47.5	14.59	139.56	38.99	146.6	34.2	352	32.2	8126	2.78	107.4	95.3
67P_L09 S 59																						

67P_L09 S 61	169	13.3	660	6.73		13.83	0.22	4.26	6.97	0.69	25.3	8.06	88.10	27.97	98.7	25.9	264	24.0	7044	4.37	111.8	130.4
67P_L09 S 62	128	8.1	851	10.04	0.01	14.96	0.32	7.71	9.13	1.07	39.1	11.21	114.25	37.93	133.6	32.3	334	29.8	6799	5.23	83.9	131.3
67P_L09 S 65	161	8.0	733	17.92		19.84	0.11	2.76	4.66	0.84	20.6	7.38	86.02	29.60	117.5	31.5	341	32.3	7825	10.57	175.8	303.6
67P_L09 S 67																						
67P_L09 S 69	87	27.5	479	16.41	0.04	13.88	0.33	4.72	5.95	1.20	17.6	5.46	62.23	20.42	78.8	20.4	243	21.5	8046	10.21	177.6	163.3
67P_L09 S 70	174	33.2	419	8.24		8.33	0.13	1.77	4.26	0.48	15.5	5.39	52.30	17.88	64.8	16.9	191	17.9	7753	4.51	67.4	94.9
67P_L09 S 74																						
67P_L09 S 75	536	61.5	2581	12.95	0.20	17.18	1.38	26.35	45.87	5.40	147.4	40.55	376.23	104.81	360.1	83.7	852	72.2	6469	8.31	863.2	466.1
67P_L09 S 76	190	32.0	897	12.33	0.16	22.90	0.54	9.06	14.24	1.63	44.0	13.77	130.75	38.90	134.7	31.5	338	29.5	6601	6.25	667.9	305.9
67P_L09 S 77	225	40.9	520	6.59	0.09	9.49	0.27	5.14	6.80	0.88	22.5	7.16	72.87	21.70	82.1	20.0	225	19.7	6514	3.88	99.7	114.2
67P_L09 S 78																						
67P_L09 S 79	287	5.8	1605	1.76		25.64	0.48	10.24	13.00	4.94	59.0	18.37	206.73	67.25	262.4	67.6	781	73.4	7237	0.58	137.1	171.0
67P_L09 S 80	181	23.1	615	27.76		15.78	0.11	2.57	5.18	0.46	23.0	7.27	81.96	26.03	106.0	25.4	286	24.9	8440	16.60	130.1	197.0
67P_L09 S 81	252	22.7	692	1.47		13.76	0.16	3.70	7.32	1.31	29.1	8.00	86.39	28.41	106.1	28.3	313	29.9	7261	0.79	103.2	107.0
67P_L09 S 83																						
67P_L09 S 84																						
67P_L09 S 85	162	23.6	1082	8.67	2.26	19.56	1.00	14.39	14.31	2.07	55.5	15.40	153.66	44.93	168.8	38.5	426	37.1	7007	5.16	138.8	157.7
67P_L09 S 86																						
67P_L09 S 89																						
67P_L09 S 90																						

67P_L09 S 91	104	7.5	618	13.98	0.00	16.60	0.06	1.38	4.46	0.60	17.7	5.93	64.69	23.53	99.0	26.7	296	26.4	7157	8.47	101.9	246.8
67P_L09 S 93																						
67P_L09 S 94	160	18.5	647	11.44		15.49	0.11	2.93	6.96	0.79	22.5	7.68	89.55	25.00	101.9	24.3	268	23.9	6794	6.21	144.1	170.5
67P_L09 S 99																						
67P_L09 S 101	245	12.7	966	2.47		20.61	0.01	2.19	4.30	0.98	23.8	8.35	103.49	35.68	162.2	43.2	515	55.2	8620	1.26	64.8	128.9
67P_L09 S 103																						
67P_L09 S 106																						
67P_L09 S 109																						
67P_L09 S 110	113	3.2	476	1.37		17.66		0.30	2.82	1.11	12.3	3.68	46.70	17.13	77.8	20.7	247	30.3	9351	0.86	84.2	223.7
67P_L09 S 113																						
67P_L09 S 114	209	24.4	902	10.75	0.04	20.34	0.28	6.16	8.66	1.52	32.3	9.53	106.98	36.32	142.1	36.1	365	39.2	8739	6.49	136.0	165.1
67P_L09 S 115																						
67P_L09 L 235	136	34.4	379	3.45	0.03	7.37	0.13	3.01	6.06	0.93	14.7	4.74	49.79	15.46	60.5	13.9	160	15.4	7193	2.14	42.8	45.1
67P_L09 L 237																						
67P_L09 L 239	50	9.5	1965	17.39	0.07	27.40	0.30	3.86	7.88	2.55	33.9	14.49	185.47	67.76	308.5	84.0	874	85.1	8736	4.62	658.7	143.5
67P_L09 L 241	91	8.7	1882	36.22	0.03	43.58	0.60	8.28	16.36	2.52	54.1	21.10	237.73	76.34	305.7	72.2	737	67.4	5505	9.70	235.7	246.0
67P_L09 L 242	203	15.6	816	3.57		6.25	0.06	1.63	3.62	0.41	18.8	6.88	88.67	31.98	134.5	34.4	424	42.8	8984	2.05	82.7	156.2
67P_L09 L 245																						
67P_L09 L 247																						
67P_L09 L 249																						
67P_L09 L 252	91	23.1	511	3.31	0.01	5.67	0.06	1.52	3.66	0.36	14.5	4.98	58.26	20.03	83.3	19.3	197	22.6	9406	2.85	143.9	143.9

67P_L09 L 255195	20.9	876	16.21		16.78	0.18	4.10	8.40	0.57	29.6	8.97	96.43	33.31	134.0	32.0	323	39.1	11205	9.73	155.3	180.3	
67P_L09 L 256126	55.4	509	4.47	0.02	7.20	0.20	4.11	6.24	0.53	17.9	5.90	66.60	20.37	79.3	17.7	179	22.7	10009	2.81	79.1	63.8	
67P_L09 L 257126	32.7	1228	5.67	0.06	12.38	1.13	16.96	18.99	3.35	56.0	16.51	173.04	51.18	193.4	44.2	415	49.4	11426	4.35	88.5	83.5	
67P_L09 L 258150	44.0	508	7.16	0.43	10.07	0.29	3.86	4.25	0.80	16.7	6.00	65.94	21.24	81.9	19.6	189	25.9	10857	4.56	53.9	59.9	
67P_L09 L 259137	7.4	1145	23.01	0.10	22.80	0.26	2.59	7.41	0.79	32.8	10.73	127.44	45.27	197.8	43.5	420	55.9	11697	12.86	197.8	244.4	
67P_L09 L 260																						
67P_L09 L 261189	25.4	3255	22.95	0.48	22.43	1.98	30.86	44.97	3.89	146.7	44.42	445.38	136.77	481.7	101.0	899	109.3	10075	14.10	393.8	275.8	
67P_L09 L 262132	7.3	2175	35.65		43.89	0.35	8.41	16.35	2.25	70.5	25.55	265.83	88.80	339.0	75.7	707	87.3	9598	17.32	698.0	504.0	
67P_L09 L 263148	13.8	3489	14.10	0.28	28.79	1.93	26.98	44.35	5.30	162.9	46.08	462.77	145.05	553.7	112.9	974	130.0	8787	6.45	347.3	224.6	
67P_L09 L 26484	5.5	267	0.20		2.57		0.78	0.98	0.53	6.3	2.13	24.66	9.88	44.0	10.6	127	19.6	9350	0.21	54.0	111.2	
67P_L09 L 265203	32.6	657	4.11		10.80	0.13	2.60	6.46	1.22	23.4	7.35	79.08	26.49	101.9	25.3	243	31.0	10243	2.04	59.5	58.5	
67P_L09 L 26696	19.5	513	3.83		5.92	0.06	2.14	3.88	0.27	15.7	5.85	62.47	20.67	85.5	19.2	199	24.6	10441	3.55	117.8	117.1	
67P_L09 Bulk 189	171	8.5	536	3.15		12.64	0.04	0.59	1.48		13.1	4.09	48.10	18.45	76.6	18.6	192	23.7	9142	2.03	107.9	213.4
67P_L09 Bulk 195	365	13.7	1061	1.44	0.05	21.06	0.35	6.37	8.57	2.15	39.0	11.34	105.89	37.93	155.5	34.5	349	46.3	7526	0.53	113.5	123.0
67P_L09 Bulk 199	107	6.5	550	0.84		9.81	0.13	2.27	3.33	1.45	15.5	5.26	51.21	19.34	78.5	17.6	187	25.4	7201	0.34	31.087.0	
67P_L09 Bulk 200	125	6.6	498	1.82	0.02	13.27	0.08	0.79	2.95	1.11	11.2	3.94	43.91	16.36	71.7	18.7	218	33.2	7053	0.63	73.2195.2	

67P_L09 Bulk 204																						
67P_L09 Bulk 206	217	11.6	1651	26.64	0.07	33.65	0.63	10.65	13.89	2.04	61.3	16.94	175.59	60.38	238.3	52.8	477	57.3	6237	8.73	228.8	303.4
67P_L09 Bulk 207	50	3.6	216	0.65		16.63	0.06	0.55	1.79	0.51	5.5	1.93	20.71	6.82	31.2	8.9	97	13.9	8793	0.27	101.0	151.1
67P_L09 Bulk 211	98	0.1	3608	39.37		30.14	0.23	4.90	13.95	2.60	91.5	34.24	415.34	134.26	519.4	111.8	938	103.2	7076	14.34	278.8	456.6
67P_L09 Bulk 222	648	11.8	1576	1.64	0.15	7.80	0.19	2.97	6.14	1.12	42.9	13.30	155.81	56.97	241.4	56.4	540	74.7	7987	0.84	108.5	187.7
67P_L09 Bulk 227	160	14.0	786	1.22	0.08	37.83	0.39	4.86	7.94	2.29	28.8	7.79	89.55	29.24	113.3	26.5	256	34.7	7319	0.56	158.4	160.6
67P_L09 Bulk 229	113	46.8	322	2.48		6.02	0.07	1.30	2.99	0.29	11.4	3.02	34.43	11.60	43.0	10.9	104	13.0	6453	1.51	59.1	64.6
67P_L09 Bulk 233	149	6.7	633	0.75	0.09	29.00	0.61	6.67	7.77	2.34	22.2	5.80	63.49	19.12	82.9	22.1	245	37.7	6497	0.21	322.1	231.6
67P_L09 Bulk 234	101	5.4	319	0.45		23.63	0.12	2.02	3.86	0.96	12.2	2.58	31.19	10.36	40.9	10.1	108	15.0	7784	0.20	66.7	88.3
67P_L09 Bulk 236	205	13.6	963	18.32	0.05	25.11	0.27	3.53	8.93	0.98	25.4	8.43	102.64	36.02	147.0	31.4	313	37.9	6107	7.87	184.4	241.3
67P_L09 Bulk 240	220	11.1	1083	1.39		6.65	0.15	2.07	4.69	0.45	23.1	8.39	103.12	37.92	160.5	35.6	320	49.5	9524	0.85	82.5	122.9
67P_L09 Bulk 241	700	9.3	2352	8.22	0.11	59.07	0.33	6.18	13.18	4.18	58.1	16.62	201.87	77.20	350.6	86.7	825	131.4	11507	2.25	276.7	224.1
67P_L09 Bulk 243	218	8.6	893	2.73		15.93	0.06	1.98	4.00	0.59	19.8	7.27	89.14	33.58	136.5	31.1	304	47.3	10179	1.37	90.3	270.3
67P_L09 Bulk 246	192	38.3	520	7.54		8.69	0.16	3.23	4.14	0.51	19.7	5.55	58.00	19.22	75.3	16.7	156	19.6	7573	4.11	78.0	89.2
67P_L09 Bulk 247	40	22.3	706	2.22		7.83	0.45	7.59	9.04	0.83	28.3	8.50	87.21	25.71	106.0	22.0	201	25.7	6845	1.76	105.9	118.2
67P_L09 Bulk 249	154	31.0	414	2.73		8.86	0.08	2.49	4.34	0.63	17.4	4.88	49.84	15.30	59.3	13.2	117	15.1	6314	1.72	37.4	38.5

67P_L09 Bulk 254	225	24.9	1152	8.87	0.12	15.31	0.50	8.30	12.94	2.30	45.7	12.80	143.00	45.02	169.2	38.3	345	43.5	6631	3.76	215.0	171.7
67P_L09 Bulk 256	128	22.9	281	2.04		4.25	0.03	0.49	1.33	0.31	6.9	2.55	28.76	10.57	41.2	10.7	101	12.9	7173	1.31	11.2	28.3
67P_L09 Bulk 260	120	8.4	303	0.90		8.09	0.06	1.20	1.92	0.87	11.0	3.03	33.77	10.02	45.4	9.5	100	12.3	6881	0.27	63.2	66.7
67P_L09 Bulk 266	144	10.5	506	2.70		5.27	0.03	0.47	1.90	0.09	9.1	3.17	46.28	17.07	82.7	20.1	204	27.2	8265	1.60	47.9	124.5
67P_L09 Bulk 267	201	12.5	1573	19.34	0.03	35.25	0.52	8.45	13.62	1.94	52.0	16.34	182.15	57.00	223.8	53.8	519	58.4	6810	9.42	350.3	370.8
67P_L09 Bulk 270	115	6.2	1461	31.53		40.79	0.36	5.26	10.81	0.86	45.8	15.25	174.45	56.69	216.9	48.0	435	52.0	6147	12.46	384.9	444.2
67P_L09 Bulk 273	205	11.0	1043	2.05		41.77	0.29	6.19	9.98	1.84	39.5	11.05	112.65	37.50	147.5	34.1	321	41.4	7333	0.89	351.9	245.2
67P_L09 Bulk 275	141	9.0	348	0.89		33.39	0.07	1.59	2.75	0.87	14.8	3.51	35.45	12.58	50.9	12.6	128	16.7	7391	0.46	121.1	135.4
67P_L09 Bulk 280																						
67P_L09 Bulk 284	611	13.4	1350	0.77		4.48	0.05	0.50	3.34	0.12	25.5	9.78	124.37	47.55	198.6	49.4	470	64.9	10186	0.45	63.6	158.8
67P_L09 Bulk 286	57	7.8	1778	19.41	0.04	43.92	0.44	6.06	15.46	5.33	53.9	17.06	203.92	73.12	318.3	81.5	901	128.5	8444	4.83	1100.9	588.8
67P_L09 S 40																						
67P_L09 S 41																						
67P_L09 S 50																						
67P_L09 S 51																						
67P_L09 S 53																						
67P_L09 S 63																						
67P_L09 S 64	231	10.6	916	6.01	0.05	12.00	0.08	1.19	3.06	0.16	22.0	8.14	95.58	36.85	156.3	41.3	468	46.7	9902	4.14	163.0	410.5

67P_L09 S 72	163	10.8	745	20.11		18.06	0.11	2.67	5.13	1.07	20.6	7.66	87.93	29.94	121.2	34.2	384	35.5	7903	12.67	150.2	373.6	
67P_L09 S 73	312	17.9	940	2.52		60.28	0.21	4.96	9.43	1.63	32.2	10.55	112.39	36.39	150.7	37.6	418	40.6	7754	1.20	565.0	371.3	
67P_L09 S 87																							
67P_L09 S 98	131	3.4	716	6.28		7.26	0.04	0.45	3.19	0.34	14.9	5.93	72.83	28.15	125.0	34.7	412	40.1	9880	4.22	174.8	580.6	
67P_L09 S 100																							
67P_L09 S 102																							
67P_L09 S 108																							
67P_L09 L 234																							
67P_L09 L 24053		6.6	2013	5.52	0.10	7.35	0.30	5.58	10.09	3.52	38.0	15.37	198.01	74.68	332.2	84.9	993	92.9	9928	1.55	544.3	105.4	
67P_L09 L 251																							
67P_L09 Bulk 190		350	18.0	4560	45.96	0.28	92.66	2.51	37.99	56.51	8.85	196.0	56.94	572.93	168.73	628.8	142.1	1298	144.4	5780	13.19	884.8	687.0
67P_L09 Bulk 193		425	11.9	798	1.22	0.17	3.10	0.13	1.11	2.00	0.28	14.8	5.43	71.65	25.40	126.9	32.3	348	48.1	8762	1.36	47.5279.2	
67P_L09 Bulk 196																							
67P_L09 Bulk 198		422	6.5	1401	2.50	0.06	10.03	0.26	3.14	10.31	4.85	56.5	17.17	170.81	50.04	190.5	43.1	446	57.0	8657	0.62	149.5	455.2
67P_L09 Bulk 201		185	8.1	1130	7.34	0.13	22.19	0.33	3.66	4.77	2.37	31.1	9.79	103.60	37.10	169.2	38.3	384	53.3	9284	2.34	404.5	606.6
67P_L09 Bulk 202		147	9.0	1257	10.97	1.34	22.04	0.51	6.40	11.05	1.30	42.0	12.82	143.65	47.20	178.2	37.8	386	44.7	6459	4.89	142.0	205.9
67P_L09 Bulk 209																							
67P_L09 Bulk 212																							
67P_L09 Bulk 213																							

67P_L09 Bulk 215	703	3.2	1346	3.23		10.38	0.02	1.73	3.19	0.47	20.9	8.90	125.95	46.09	195.1	49.3	515	67.3	8495	1.62	129.3	298.8
67P_L09 Bulk 217																						
67P_L09 Bulk 225	296	17.7	956	2.65		79.61	0.42	6.18	10.67	2.63	30.2	9.76	98.13	31.79	135.3	32.3	327	43.6	6513	1.33	382.7	293.2
67P_L09 Bulk 230	247	25.5	957	3.57	0.34	63.67	0.58	7.54	11.97	3.77	43.1	10.30	102.11	33.19	119.9	27.4	296	37.0	6836	1.52	634.4	557.9
67P_L09 Bulk 235																						
67P_L09 Bulk 237	195	4.2	943	6.16	0.02	7.70	0.05	1.50	1.44	0.61	14.9	6.29	83.53	28.52	140.4	39.0	374	48.2	9649	4.37	180.2	804.3
67P_L09 Bulk 238																						
67P_L09 Bulk 242																						
67P_L09 Bulk 252																						
67P_L09 Bulk 253	114	17.7	593	6.92	0.06	16.10	0.13	3.22	5.35	0.31	23.6	6.76	68.36	21.60	80.6	18.0	162	21.6	6713	2.48	64.6	84.3
67P_L09 Bulk 255	359	22.1	997	1.68	0.54	26.36	0.30	2.52	6.92	1.91	27.1	8.73	100.02	38.57	166.5	38.2	393	56.7	7499	0.67	45.5	78.5
67P_L09 Bulk 259	252	11.0	948	4.61	0.40	36.48	0.88	6.50	11.11	3.78	36.6	10.14	111.49	33.99	120.5	28.9	285	34.4	9047	1.50	506.2	680.9
67P_L09 Bulk 262																						
67P_L09 Bulk 263																						
67P_L09 Bulk 265	385	270.9	2710	3.08	1.15	43.96	2.85	28.65	25.71	8.73	85.7	25.33	266.65	89.91	371.7	89.9	878	114.0	6838	0.92	309.0	395.8
67P_L09 Bulk 268	105	2.5	384	1.80		9.21	0.05	0.69	3.00	0.97	7.3	2.96	25.56	10.05	52.3	17.2	201	32.8	11289	1.31	101.8	799.6

67P_L09 Bulk	269	209	6.5	899	8.91		14.05	0.08	0.97	2.80	0.27	17.2	7.01	83.24	30.91	145.6	36.2	367	49.5	8992	5.04	232.1	537.6
67P_L09 Bulk	272																						
67P_L09 Bulk	274																						
67P_L09 Bulk	278	37	12.8	436	2.56		4.97	0.06	1.26	4.30	0.31	11.8	3.80	44.87	15.24	59.6	15.0	141	19.8	6666	1.93	125.5	174.7
67P_L09 Bulk	279	163	3.9	722	4.74		12.51	0.04	1.50	2.64	0.37	17.1	4.71	64.80	23.20	102.0	27.5	301	40.3	9573	1.92	391.9	460.1
68P_L09 S	118	191	9.9	882	12.54	0.15	18.70	0.17	4.03	7.71	1.36	28.3	9.87	110.31	37.59	153.2	37.0	398	36.9	7882	8.26	109.2	209.7
68P_L09 S	120																						
68P_L09 S	122																						
68P_L09 S	124	195	13.3	1355	23.65	0.03	23.70	0.55	7.95	11.10	2.07	55.4	16.67	178.01	57.25	230.9	54.0	601	56.7	7236	10.90	166.8	311.0
68P_L09 S	125																						
68P_L09 S	129																						
68P_L09 S	130	170	2.4	2161	108.88		50.39	0.12	2.51	11.42	1.59	65.0	24.98	281.97	92.31	347.2	77.3	786	63.3	6553	35.18	333.9	821.6
68P_L09 S	132																						
68P_L09 S	134																						
68P_L09 S	135	227	14.7	1080	22.79	0.04	24.78	0.48	5.43	9.52	1.83	35.3	11.62	131.55	43.47	175.9	43.4	468	44.4	7730	11.00	232.0	318.7
68P_L09 S	138																						
68P_L09 S	140																						
68P_L09 S	116																						
68P_L09 S	117																						

68P_L09 S 119	260	5.9	907	5.08	0.17	35.56	0.63	7.66	10.56	3.23	28.6	8.34	86.11	32.83	156.3	45.9	569	58.4	8379	1.41	488.9	614.6
68P_L09 S 121	326	12.6	1010	2.54		40.22	0.23	3.72	7.17	2.12	28.4	10.37	110.28	37.25	155.9	44.6	519	49.4	10333	1.57	442.9	597.1
68P_L09 S 123																						
68P_L09 S 127																						
68P_L09 S 128																						
68P_L09 S 133																						
68P_L09 S 137																						
68P_L09 S 141																						
68P_L09 S 144																						
68P_L09 S 145	212	12.4	2066	61.29		69.66	0.75	12.52	20.81	2.72	77.0	24.78	267.35	83.20	313.7	74.6	833	68.2	6227	21.86	602.6	720.9
68P_L09 S 147	237	2.3	861	1.92	0.16	12.50	0.19	2.89	4.03	0.89	23.5	7.16	87.16	31.27	143.5	39.1	495	48.5	7227	1.35	194.4	474.7
68P_L09 S 148	176	4.8	740	1.15	0.44	17.85	0.53	4.24	5.59	2.09	21.4	6.92	73.53	25.37	110.0	27.9	329	30.6	6249	0.87	263.4	478.8
72P_L09 M_1	168	8.3	978	1.05		6.16	0.19	3.45	6.23	1.34	28.8	9.36	108.70	36.98	146.4	33.0	348	45.3	8227	0.35	48.3	58.1
72P_L09 M_2	158	8.0	506	2.04		11.96		0.27	1.49	0.11	9.0	3.43	45.32	17.19	84.0	23.1	256	33.6	11698	1.47	62.2	128.3
72P_L09 M_3	188	27.6	567	1.55		5.27	0.05	1.17	3.03	0.29	14.0	4.89	58.95	20.88	92.9	24.0	260	32.7	9768	0.74	24.8	34.0
72P_L09 M_4																						
72P_L09 M_5	140	12.7	407	1.44		9.87	0.03	0.99	3.08	0.32	12.1	3.53	42.19	15.02	64.6	15.8	173	21.8	10547	0.77	78.1	109.7
72P_L09 M_6	369	8.2	1443	3.23	0.03	15.09	0.18	3.91	8.98	3.01	43.7	14.98	162.90	52.32	214.8	54.5	574	70.7	8930	1.42	143.3	182.7
72P_L09 M_7	180	11.7	517	1.23		5.23	0.02	0.74	2.69	0.12	10.6	3.81	53.42	19.86	82.7	20.4	215	25.1	9686	0.98	58.5	121.6
72P_L09 M_8																						

72P_L09 M_11																					
72P_L09 M_12151	15.9	384	1.16	0.08	28.72	0.14	2.75	3.85	1.25	13.9	4.40	43.96	14.38	52.3	12.1	138	17.1	9445	0.59	90.2	122.2
72P_L09 M_13264	8.3	780	1.54		4.34	0.00	1.06	4.94	0.51	25.2	7.47	87.99	29.37	116.0	25.5	268	33.3	11560	0.92	85.2	306.0
72P_L09 M_14167	16.2	1098	0.42	0.01	1.95	0.16	3.06	6.04	2.58	32.2	10.22	120.41	42.19	175.6	39.1	389	51.0	7408	0.41	37.0	55.5
72P_L09 M_16226	8.5	942	6.83	0.11	8.96	0.09	2.18	4.32	0.25	23.3	8.19	103.28	37.62	152.1	36.9	376	47.7	10319	2.93	52.9	85.0
72P_L09 M_18252	17.3	1324	5.96	0.04	10.87	0.11	2.65	8.68	0.09	39.5	13.27	160.58	53.32	201.9	46.0	475	47.9	10386	3.18	144.0	256.9
72P_L09 M_19																					
72P_L09 M_20																					
72P_L09 M_23233	5.2	727	1.09	0.03	13.78	0.09	2.41	4.74	0.98	18.0	5.03	66.88	25.13	114.0	32.3	396	42.9	6465	0.56	138.3	221.7
72P_L09 M_24																					
72P_L09 M_26																					
72P_L09 M_28																					
72P_L09 M_30																					
72P_L09 M_31236	39.1	621	1.47	0.05	29.36	0.28	4.20	8.14	2.24	25.3	6.91	72.54	23.63	90.5	23.8	275	28.5	5780	0.89	31.1	33.8
72P_L09 M_32																					
72P_L09 M_36238	5.7	1559	3.00	0.04	16.59	0.51	10.09	16.15	1.80	64.9	18.52	193.43	61.71	238.4	55.1	573	62.3	6757	1.28	178.2	242.0
72P_L09 M_38																					
72P_L09 M_40																					
72P_L09 M_41																					
72P_L09 M_44																					
72P_L09 M_45																					
72P_L09 M_46113	1.8	259	4.22		5.59	0.03	0.48	1.29	0.10	5.4	1.89	28.20	9.62	44.8	12.1	148	15.0	6859	1.58	9.3	34.7
72P_L09 M_50																					

72P_L09 L_161	82	29.9	867	3.58	0.15	9.13	0.84	13.68	14.94	2.22	42.6	10.95	120.80	36.45	128.4	31.2	322	32.9	7308	3.31	150.2	172.1
72P_L09 L_162																						
72P_L09 L_163	109	46.4	330	3.92	0.03	4.37	0.13	2.65	3.58	0.67	14.1	4.36	46.68	13.92	51.3	13.0	143	12.7	5771	2.96	90.9	112.3
72P_L09 L_164																						
72P_L09 L_165																						
72P_L09 L_166																						
72P_L09 L_168																						
72P_L09 L_169																						
72P_L09 L_170																						
72P_L09 L_171																						
72P_L09 L_172																						
72P_L09 L_173																						
72P_L09 L_174																						
72P_L09 L_175																						
72P_L09 L_176																						
72P_L09 L_177	150	29.8	423	6.37		9.58	0.18	2.94	4.79	0.44	15.6	5.26	52.93	17.34	66.5	17.0	180	17.6	6369	3.14	72.5	102.1
72P_L09 L_178	139	36.6	396	5.95		8.65	0.15	3.28	4.37	0.57	15.1	4.55	49.80	15.20	58.8	16.2	169	16.7	5918	3.03	69.7	98.2
72P_L09 L_179	114	18.7	345	2.67		3.10	0.11	1.00	2.66	0.59	8.9	3.46	41.38	13.40	52.6	13.8	156	16.7	5242	1.82	25.8	39.2
72P_L09 L_180	70	16.9	458	11.47		9.36	0.30	4.00	5.56	0.29	17.0	5.75	60.90	19.74	79.8	20.0	220	21.2	6625	8.35	92.1	216.1
72P_L09 L_181	303	16.0	744	1.47		7.19	0.08	1.45	4.85	0.14	20.0	6.90	78.84	28.10	118.5	28.8	318	30.6	8121	0.77	149.1	156.6
72P_L09 L_182	149	17.2	472	1.55		14.00	0.16	3.12	5.19	0.63	17.6	5.09	51.85	17.46	70.3	17.7	208	21.6	7662	0.86	125.7	162.4
72P_L09 L_183																						
72P_L09 L_184	47	18.1	656	1.62	0.16	4.19	0.61	5.79	6.98	1.51	23.1	7.18	78.90	26.26	111.9	29.4	320	29.2	6024	1.80	148.6	185.5

72P_L09 L_18541	19.0	534	1.55	0.12	3.72	0.53	6.40	7.64	1.07	21.6	6.48	69.44	22.21	87.7	23.2	256	23.4	5661	1.22	103.6	127.5
72P_L09 L_188																					
72P_L09 L_189194	26.3	420	1.09		7.07	0.04	1.47	2.34	0.38	12.6	3.91	47.46	16.02	64.4	16.3	181	18.3	7522	0.37	34.5	71.6
72P_L09 L_190																					
72P_L09 L_19194	23.9	727	18.88	0.02	7.54	0.27	4.20	6.25	0.70	21.3	7.67	87.06	29.30	121.0	30.2	334	29.6	6467	10.44	233.5	499.9
72P_L09 L_19251	17.0	949	9.48	0.01	6.94	0.19	2.45	3.81	0.53	21.9	7.59	100.10	35.67	152.8	42.2	442	40.6	5129	4.42	411.6	394.2
72P_L09 L_19348	11.9	295	2.39	0.03	3.53	0.09	1.34	1.68	0.27	6.9	2.55	32.05	11.01	48.9	13.4	147	13.1	6132	1.69	78.7	122.5
72P_L09 L_194345	6.9	760	2.20		6.06	0.01	1.01	3.04	0.29	14.8	6.00	73.91	28.47	123.9	33.4	377	40.5	8570	0.85	62.7	136.8
72P_L09 L_195293	6.2	585	1.65		6.13	0.04	0.65	1.98	0.06	11.9	4.74	56.25	21.69	93.8	25.6	291	30.6	8577	1.10	51.1	109.6
72P_L09 L_197134	13.0	627	14.36		18.55	0.17	4.33	5.91	1.04	22.7	6.73	75.03	23.90	98.4	24.4	243	24.6	6918	9.03	236.4	236.3
72P_L09 L_198158	12.6	275	1.07		6.23	0.06	1.06	2.03	0.15	8.6	2.62	28.88	9.64	38.2	10.6	115	13.4	8369	0.58	42.5	71.9
72P_L09 L_199209	14.3	509	2.45		7.34	0.15	2.67	6.35	0.58	25.2	6.72	60.92	18.82	71.0	16.8	191	20.5	7491	0.50	91.8	93.2
72P_L09 L_20093	3.7	66	0.72		0.20	0.02	0.18	0.25	0.13	1.0	0.44	6.22	2.38	10.6	3.0	33	4.7	8479	0.16	6.8	21.7
72P_L09 L_201																					
72P_L09 L_203																					
72P_L09 L_20491	30.7	507	10.86		5.38	0.16	3.16	4.60	0.52	15.9	4.60	57.70	20.21	88.0	22.7	253	26.6	5703	5.28	118.6	210.9
72P_L09 L_20576	16.9	1158	15.28		13.71	0.26	4.38	7.83	1.04	31.9	11.78	141.53	46.31	178.4	45.3	444	37.6	7084	8.47	379.4	493.2
72P_L09 L_20694	22.7	348	3.42		7.86	0.11	2.30	3.73	0.53	12.0	3.87	37.64	13.64	53.0	14.5	159	15.2	6729	2.13	118.7	154.6

72P_L09 L_207																						
72P_L09 L_208																						
72P_L09 L_209	179	10.2	544	1.42		14.43	0.04	0.95	2.25	0.36	12.1	4.19	53.75	19.18	88.4	25.6	310	30.8	8361	0.73	58.9	187.4
72P_L09 L_210																						
72P_L09 L_211	61	18.9	687	5.46	0.09	7.43	0.15	3.05	5.30	0.71	20.4	6.97	78.73	26.53	115.4	30.4	325	31.0	5489	4.01	284.6	303.4
72P_L09 L_212																						
72P_L09 L_213	91	28.3	325	4.86		5.03	0.10	2.67	3.76	0.47	12.3	3.87	44.19	13.53	53.4	13.7	149	14.8	5740	3.46	129.5	159.6
72P_L09 L_214																						
72P_L09 L_215	408	18.6	870	1.73	0.02	4.97	0.06	1.68	4.18	0.42	20.7	7.47	94.41	31.45	135.5	33.3	380	39.2	8574	0.82	57.7	125.2
72P_L09 L_216	474	12.7	1144	0.84		4.27	0.05	1.22	4.27	0.25	25.2	9.08	119.87	44.31	177.8	44.4	497	51.3	8433	0.61	70.6	170.2
72P_L09 L_217	174	8.5	339	0.56		6.47	0.09	0.93	1.88	0.85	6.1	2.45	25.12	10.95	52.2	16.9	197	29.3	7793	0.35	44.4	118.8
72P_L09 L_218	138	6.0	392	0.25		6.99	0.18	2.74	4.60	1.56	13.1	3.38	40.28	13.61	56.7	15.6	181	24.5	8429	0.25	74.7	114.4
72P_L09 L_219	167	7.3	401	1.41		4.05		0.53	0.97	0.22	7.0	2.66	34.01	13.51	63.3	17.9	207	28.1	9972	0.85	22.2	83.0
72P_L09 L_220																						
72P_L09 L_221	170	3.6	619	3.50		29.79		0.60	1.49	0.41	11.1	4.54	55.44	21.07	94.3	24.9	247	31.2	10810	1.64	113.9	128.3
72P_L09 L_222																						
72P_L09 L_223																						
72P_L09 L_224	256	17.2	803	2.08		7.37		0.68	2.57	0.55	17.4	5.69	78.98	29.32	126.8	31.5	350	45.4	9838	1.11	23.8	41.4
72P_L09 L_225																						
72P_L09 L_226	55	19.7	628	1.77	0.16	3.57	0.40	6.30	8.21	1.21	23.6	7.51	77.04	25.13	102.2	26.1	274	29.2	6228	1.66	120.0	128.5

72P_L09 L_22759	18.3	733	2.11	0.14	4.16	0.55	5.62	9.24	1.27	25.0	8.33	84.68	29.00	116.3	30.8	342	34.1	6586	1.63	157.5	172.8
72P_L09 M_17210	6.5	812	8.75		13.36	0.05	0.86	3.14	0.33	16.5	6.14	78.23	27.66	129.8	33.4	359	45.8	11293	5.70	191.1	372.6
72P_L09 M_21																					
72P_L09 M_27																					
72P_L09 M_33																					
72P_L09 M_34																					
72P_L09 M_35																					
72P_L09 M_37																					
72P_L09 M_43300	32.5	2591	4.69	0.16	15.79	0.56	7.69	17.13	1.11	78.6	25.07	299.15	102.52	396.1	90.8	943	83.9	6308	1.96	299.6	517.1
72P_L09 L_186																					
72P_L09 L_187																					
72P_L09 L_196127	12.3	604	16.66	0.03	13.42	0.16	3.55	5.85	0.73	19.0	6.55	74.75	24.22	94.0	22.4	240	25.3	6020	9.69	102.4	167.9
72P_L09 L_202222	2.9	504	1.14	0.02	3.35	0.03	0.73	3.20	0.48	18.7	5.17	52.84	18.04	77.3	21.2	237	26.3	8218	1.13	123.6	481.6
73P_L09 M_51172	5.5	696	4.58	0.02	7.08	0.07	1.04	1.90	0.15	13.1	4.78	62.32	24.64	109.3	27.3	283	37.0	9653	2.79	85.5	172.1
73P_L09 M_52169	9.7	668	3.72		5.90	0.03	0.58	1.72	0.23	11.5	4.31	62.90	23.86	102.8	26.2	258	34.2	9732	2.34	64.4	126.9
73P_L09 M_53608	12.9	1654	1.24		5.66	0.11	1.11	5.56	0.24	35.7	12.41	159.39	59.02	259.0	61.7	619	79.2	11747	0.88	88.1	182.3
73P_L09 M_54																					
73P_L09 M_55190	4.1	998	0.95		4.95	0.10	2.73	5.82	0.94	29.8	8.65	106.03	37.35	154.4	36.1	376	49.0	9562	0.64	66.4	128.1

73P_L09 M_58172	5.6	675	2.30		16.39	0.04	0.76	3.26	0.33	16.4	5.18	66.21	24.10	104.4	26.7	279	34.2	10243	1.66	136.8	205.2
73P_L09 M_62299	10.9	914	3.34	0.10	31.53	0.58	6.13	9.40	3.34	33.5	9.61	107.54	33.77	137.6	36.8	427	49.0	9689	1.38	193.1	205.6
73P_L09 M_63448	4.3	1020	4.12		16.30	0.03	0.76	2.30	0.44	14.0	6.15	87.16	34.52	169.0	50.7	636	75.3	10375	2.63	82.2	253.9
73P_L09 M_65105	30.5	470	2.95	0.06	3.71	0.13	1.51	3.38	0.42	11.7	4.43	49.42	16.81	72.3	19.2	212	23.1	7692	2.14	492.4	332.5
73P_L09 M_66117	3.9	249	0.41		4.29	0.04	0.34	1.19	0.57	5.6	1.63	21.24	8.17	40.9	11.9	152	25.0	9672	0.50	72.8	215.8
73P_L09 M_68157	4.7	366	0.98		18.00	0.04	0.92	1.58	0.25	8.3	2.76	32.96	12.13	53.7	14.2	156	20.3	10391	0.79	100.3	183.5
73P_L09 M_69																					
73P_L09 M_71251	8.9	1219	7.09		12.74	0.07	1.89	4.42	0.07	23.7	8.27	111.05	44.04	193.4	47.4	491	60.9	12075	4.51	200.1	406.4
73P_L09 M_72109	17.8	3056	14.78	0.70	24.06	2.36	31.63	38.50	11.77	126.1	37.78	400.16	125.82	483.1	108.3	993	103.1	7584	5.26	840.5	483.6
73P_L09 M_76																					
73P_L09 M_77																					
73P_L09 M_78224	13.8	922	3.89		7.87	0.03	1.19	3.17	0.33	20.5	6.41	88.82	33.93	141.5	34.6	374	45.9	10262	2.17	98.2	171.2
73P_L09 M_79215	5.7	1385	2.69	0.07	8.27	0.20	4.60	10.28	1.32	37.6	13.62	152.30	54.95	208.0	49.4	484	59.5	9808	1.48	117.8	176.3
73P_L09 M_82226	8.5	914	6.88		27.00	0.09	1.99	3.55	0.20	18.5	6.74	87.79	32.43	146.7	37.9	407	48.5	11292	3.61	194.4	154.2
73P_L09 M_83																					
73P_L09 M_84224	8.0	2830	6.19	0.02	9.56	0.19	5.31	11.86	2.10	69.5	25.20	315.01	113.05	460.8	108.5	1108	122.6	8867	2.88	125.5	161.2
73P_L09 M_85																					
73P_L09 M_86174	3.5	920	1.13		11.94	0.07	1.37	4.80	1.00	20.8	7.16	90.55	32.47	148.9	40.3	475	56.9	8605	0.67	94.2	156.0
73P_L09 M_87																					

73P_L09 M_88137	4.0	368	2.44		16.18	0.02	0.80	1.41	0.26	7.4	2.71	36.96	12.77	58.9	16.8	211	23.2	8658	1.38	116.0	320.6	
73P_L09 M_89177	13.4	831	23.16	13.61	39.14	2.86	14.82	8.83	1.10	28.8	8.94	107.47	35.61	139.7	33.8	347	32.5	5415	9.70	67.8	155.6	
73P_L09 M_91																						
73P_L09 M_92259	14.9	656	2.58		47.67	0.13	2.92	6.60	1.50	22.3	6.73	75.00	23.58	97.7	24.2	277	27.8	7051	1.08	219.3	212.4	
73P_L09 M_94																						
73P_L09 M_96321	10.0	747	2.76		15.12	0.15	2.72	6.87	0.14	24.5	8.06	90.49	28.73	115.2	27.7	304	28.7	8366	1.14	332.5	310.3	
73P_L09 M_97305	29.2	800	2.06	0.10	8.82	0.14	2.68	5.71	1.01	26.3	7.89	93.01	30.77	120.3	29.4	322	31.9	7164	0.87	67.3	108.6	
73P_L09 M_100																						
73P_L09 M_101	182	9.1	534	5.61		29.64	0.05	0.94	2.15	0.25	12.1	4.00	50.39	18.40	85.4	22.0	263	29.3	8541	2.02	141.7	246.9
73P_L09 M_105																						
73P_L09 M_107	482	12.4	1074	0.78		2.84	0.05	1.49	3.13	0.18	22.7	8.20	110.99	40.22	169.6	43.4	489	51.2	9099	0.72	61.2191.8	
73P_L09 M_108	377	15.3	1917	1.21		9.07	0.18	4.35	10.45	1.39	52.2	17.74	205.27	71.46	287.7	71.8	810	79.3	7792	0.89	123.4	235.4
73P_L09 M_110																						
73P_L09 M_111																						
73P_L09 M_112	227	18.2	745	4.50		4.53	0.08	1.97	5.01	0.36	22.4	6.76	86.02	28.68	114.9	29.6	315	30.5	7433	1.93	25.142.5	
73P_L09 M_113																						
73P_L09 M_114	131	10.5	3333	24.79	0.21	29.87	2.22	38.16	58.23	6.91	182.5	51.12	512.02	140.88	507.7	108.1	1095	94.6	5028	7.79	329.7	566.6

73P_L09 M_115																						
73P_L09 M_116	252	40.5	2066	18.51	0.35	16.61	1.91	29.35	39.03	6.93	107.5	29.13	305.58	86.69	315.7	72.5	742	64.9	5517	9.81	247.3	255.5
73P_L09 M_117																						
73P_L09 M_119	552	13.3	1001	1.81		3.91	0.07	1.33	4.75	0.65	22.7	8.84	106.18	37.98	153.0	39.0	463	43.3	7564	0.85	63.6	175.4
73P_L09 M_120	89	2.8	517	16.59		16.01	0.06	1.04	3.00	0.30	19.1	6.09	70.35	22.10	80.7	18.7	200	17.2	4661	6.36	36.7	143.5
73P_L09 M_121	180	8.2	349	1.03		17.92	0.04	0.94	2.90	0.57	13.4	3.38	37.09	13.09	53.9	14.1	164	16.1	7713	0.46	61.5	174.7
73P_L09 M_122	185	24.0	290	0.91		7.79	0.04	0.40	2.05	0.26	7.9	2.74	30.01	10.06	45.2	11.1	142	14.3	6927	0.55	31.7	93.6
73P_L09 M_123	255	8.6	602	3.27	0.04	27.96	0.02	0.71	2.01	0.92	12.3	4.17	56.72	23.10	95.7	28.1	379	38.3	7098	1.54	56.5	140.1
73P_L09 M_124	222	9.8	532	3.50		38.57	0.09	1.24	3.04	0.83	12.5	4.33	54.04	18.89	76.8	20.8	263	24.6	7542	1.74	185.8	267.7
73P_L09 M_125	182	15.4	438	2.25		13.40	0.02	1.21	2.62	0.22	10.8	3.96	50.14	16.53	68.4	19.5	229	21.7	7435	1.41	97.1	275.6
73P_L09 L_230																						
73P_L09 L_231																						
73P_L09 L_232	43	2.8	51	0.13		0.75			0.05	0.06	0.9	0.33	4.75	1.56	8.7	2.4	35	4.4	5842	0.06	19.9	67.8
73P_L09 L_233	44	2.9	65	0.13		0.65				0.12	0.3	0.45	5.07	2.18	10.3	3.0	44	5.7	6202	0.11	22.8	110.5
73P_L09 L_234	215	9.1	354	1.04		3.47	0.03	1.02	2.98		11.0	3.98	39.22	12.95	49.6	12.0	120	12.6	10141	0.46	127.4	221.0
73P_L09 L_235	106	7.0	289	0.52		7.19	0.02	0.31	1.19	0.28	6.7	2.06	25.95	10.15	45.3	12.4	156	18.9	8261	0.33	26.6	127.6
73P_L09 L_236	133	8.1	413	0.49		6.46	0.08	0.55	1.50	0.44	10.3	3.61	41.51	14.70	62.4	16.9	206	23.8	7629	0.32	22.5	93.6

73P_L09 L_237322	3.5	808	2.44		6.17	0.04	1.05	3.80	0.25	19.1	7.16	84.73	30.23	122.0	32.2	346	39.1	9352	1.87	123.6	348.4
73P_L09 L_238278	5.0	666	1.82		11.59	0.03	0.91	2.46	0.16	18.1	5.62	69.46	24.43	99.0	25.1	265	27.2	8981	0.96	181.1	227.8
73P_L09 L_239127	7.5	630	4.60	0.04	56.45	0.14	2.52	3.91	1.63	18.6	5.92	64.31	21.66	91.3	24.2	273	27.9	6808	2.18	341.9	487.2
73P_L09 L_24083	4.9	198	0.33		2.23		0.20	0.83	0.22	3.2	1.24	16.51	6.73	35.3	10.2	133	17.5	7568	0.16	18.0	48.1
73P_L09 L_242329	20.8	978	1.66		4.14	0.12	3.14	8.50	0.45	36.1	11.10	115.56	37.18	140.3	33.9	365	36.3	8270	0.85	61.4	86.0
73P_L09 L_243121	6.3	449	0.97		8.31		0.51	1.40	0.17	8.6	3.03	40.79	15.37	69.2	19.5	220	22.8	9596	0.69	93.5	316.8
73P_L09 L_244																					
73P_L09 L_246146	10.0	586	8.26		8.47	0.04	2.17	5.08	0.85	17.0	6.17	68.46	21.45	87.6	23.9	256	25.0	6322	4.63	88.1	148.1
73P_L09 L_247201	12.8	1091	1.02		27.02	0.07	2.33	6.02	0.63	32.9	10.09	116.36	38.71	157.7	38.8	407	40.2	8619	0.68	187.4	218.6
73P_L09 L_248																					
73P_L09 L_249																					
73P_L09 L_250																					
73P_L09 L_25190	27.0	1297	6.56	0.22	8.39	0.98	14.05	21.24	2.73	55.0	16.85	176.38	54.91	198.7	49.0	485	45.9	6299	4.58	365.3	360.5
73P_L09 L_253																					
73P_L09 L_254184	19.7	800	0.85	0.05	39.09	0.42	7.83	12.02	3.09	42.6	9.64	100.17	30.08	111.9	28.2	285	29.5	6974	0.34	210.1	95.2
73P_L09 L_255236	18.6	650	1.40		51.93	0.23	4.25	7.88	1.44	25.8	7.32	73.93	24.13	94.8	22.7	237	26.2	7914	0.83	293.3	137.4
73P_L09 L_256103	32.6	1084	5.15	0.19	12.90	1.15	18.16	18.66	1.70	51.4	14.80	148.77	44.09	168.0	40.8	409	41.4	8132	3.65	142.2	160.9
73P_L09 L_257112	30.0	1091	4.89	0.13	11.87	1.08	15.37	18.35	1.40	54.7	15.49	150.03	46.14	166.9	40.5	398	42.7	7986	3.58	130.1	141.6

73P_L09 L_258235	12.2	848	3.94	0.03	48.16	0.10	3.32	5.92	1.26	25.7	7.51	85.71	31.35	128.9	31.3	315	38.3	9233	1.72	325.0	275.7
73P_L09 M_60																					
73P_L09 M_61																					
73P_L09 M_64100	4.7	2215	4.14	0.07	32.08	0.48	6.52	9.87	0.71	46.6	16.31	204.37	78.36	348.9	90.3	963	111.2	9280	1.80	362.5	556.2
73P_L09 M_67																					
73P_L09 M_701148	10.2	1852	2.81	1.24	47.03	2.09	21.99	19.80	4.80	45.6	15.35	183.25	68.60	298.3	73.2	774	94.8	13055	1.89	118.1	563.4
73P_L09 M_73																					
73P_L09 M_74																					
73P_L09 M_80																					
73P_L09 M_90279	8.7	1024	7.93		25.44	0.18	2.30	6.52	0.75	28.2	9.33	110.37	37.21	148.6	37.1	421	41.8	7573	4.56	395.6	549.9
73P_L09 M_93																					
73P_L09 M_98143	5.8	338	5.31	0.03	7.67	0.13	0.98	2.37	0.86	8.5	3.28	35.07	12.39	49.0	14.7	192	24.2	10076	2.74	113.3	379.0
73P_L09 M_99																					
73P_L09 M_103	511	10.7	1310	4.95	0.79	17.98	2.30	27.13	47.48	19.17	108.0	24.69	202.06	49.31	172.9	39.2	429	44.5	7884	1.30	122.9 258.5
73P_L09 M_106	77	2.5	105	0.90		0.03				0.04	0.4	0.32	6.99	3.30	17.7	5.7	85	11.7	9008	1.29	0.1 15.8
73P_L09 M_109																					
73P_L09 M_118																					
73P_L09 L_228360	6.6	1532	7.93	0.03	15.72	0.21	4.64	8.81	0.29	40.7	15.12	171.30	57.38	241.9	57.9	593	57.3	7254	5.20	513.1	488.1
73P_L09 L_229266	8.6	2605	7.87	0.01	15.40	0.50	7.14	16.07	0.83	72.7	25.53	294.82	103.84	400.9	92.6	916	81.2	9079	4.69	364.7	542.5

73P_L09 L_241																						
73P_L09 L_245																						
73P_L09 L_252	129	37.4	982	5.95	0.13	10.72	0.91	15.29	16.64	1.67	48.6	14.20	131.87	40.04	145.5	34.4	346	32.7	7547	3.85	118.9	131.1
74P_L09 M_126	246	12.1	1080	3.32		21.33	0.20	3.54	4.89	2.09	23.5	8.46	102.06	38.40	173.0	46.1	527	74.7	10922	1.85	200.3	219.4
74P_L09 M_127	145	10.5	450	1.58		9.40	0.05	0.67	1.84	0.31	10.5	3.83	48.93	15.67	71.1	18.9	197	25.3	11194	1.17	90.4	245.9
74P_L09 M_128	129	12.9	345	1.41		7.20	0.02	0.64	1.06	0.10	7.1	2.73	33.04	11.75	54.5	14.3	151	20.6	11715	1.18	66.0	205.9
74P_L09 M_129	178	30.5	1110	0.71	0.06	2.78	0.46	6.97	9.47	2.68	42.5	12.24	135.89	42.85	165.9	36.4	365	46.7	8015	0.34	25.0	29.7
74P_L09 M_130	303	40.3	1370	2.48	0.09	45.20	0.59	11.99	19.72	5.53	69.2	17.94	177.31	54.72	187.4	42.8	422	49.8	9561	0.88	47.0	18.5
74P_L09 M_131																						
74P_L09 M_132																						
74P_L09 M_133	123	21.0	835	5.27	0.08	8.14	0.40	7.16	8.73	1.21	35.6	10.37	104.87	33.22	122.5	28.5	274	30.8	8774	2.78	65.9	77.3
74P_L09 M_134	154	20.8	412	0.92		2.59	0.02	0.93	2.80	0.45	14.1	4.25	49.30	15.94	63.7	15.8	173	18.6	7034	0.41	9.8	19.1
74P_L09 M_135	123	21.6	333	0.57		1.72	0.04	1.10	1.34	0.47	10.8	3.24	39.80	12.84	51.2	13.2	139	16.4	6798	0.40	5.2	12.4
74P_L09 M_136																						
74P_L09 M_137	167	4.8	641	4.04		15.34	0.06	0.54	3.25	0.11	15.8	5.63	69.98	23.52	94.5	24.8	265	27.4	9560	2.32	105.2	437.6
74P_L09 M_138	167	9.1	460	4.76		7.16	0.02	0.69	1.24	0.25	8.2	3.46	45.49	16.14	72.7	20.4	236	24.2	9553	2.58	51.7	227.1

74P_L09 M_141																						
74P_L09 M_142	286	14.9	1542	1.88	0.05	25.68	0.24	5.62	9.96	2.42	41.5	13.35	151.40	53.17	240.2	61.5	663	87.0	8645	0.93	135.4	106.3
74P_L09 M_144	474	11.7	1287	0.93		4.45	0.04	1.56	3.49	0.20	24.9	10.10	127.48	48.32	201.6	50.7	507	64.5	11861	0.87	68.5	153.2
74P_L09 M_148																						
74P_L09 M_151	179	9.4	597	3.20		9.35	0.01	1.15	2.86	0.16	14.5	5.01	64.08	22.37	91.1	23.6	272	27.5	8449	1.88	75.9	264.4
74P_L09 M_152																						
74P_L09 M_154	142	11.9	992	2.56	0.03	11.63	0.44	7.51	12.18	0.73	44.3	13.09	128.09	39.52	148.9	36.1	398	36.8	7376	1.67	166.8	321.9
74P_L09 M_155																						
74P_L09 M_156	78	8.7	627	7.99		15.16	0.21	4.28	6.60	2.02	26.4	7.74	84.16	26.40	100.2	25.1	255	20.9	4187	5.92	170.7	267.7
74P_L09 M_157																						
74P_L09 M_158																						
74P_L09 M_159																						
74P_L09 L_259	930	6.9	2899	3.42	0.02	12.19	0.23	4.76	15.72	1.93	79.4	27.31	328.17	112.33	435.9	107.2	1123	112.8	8127	1.42	163.6	207.9
74P_L09 L_260	795	10.3	1957	3.71		10.84	0.11	3.00	7.62	1.14	48.3	17.30	213.81	74.42	299.9	74.4	822	81.4	7900	1.15	113.7	165.4
74P_L09 L_261	327	12.5	678	0.93		4.74	0.05	1.08	2.21	0.23	16.0	5.69	69.05	25.90	107.4	27.4	312	32.6	8586	0.61	46.9	126.2
74P_L09 L_262																						

74P_L09 L_263	298	6.9	670	1.28		7.93	0.13	2.37	5.06	0.73	23.2	6.11	74.29	23.99	95.0	25.4	281	30.6	7051	0.51	123.4	168.4
74P_L09 L_264	201	5.6	516	0.45		6.21	0.11	1.87	5.24	0.61	20.2	5.76	62.00	19.49	77.6	19.5	202	21.4	7629	0.33	105.9	133.3
74P_L09 L_265																						
74P_L09 L_266																						
74P_L09 M_145																						
74P_L09 M_153																						
NFH S 149																						
NFH S 157																						
NFH S 160																						
NFH S 161																						
NFH S 162																						
NFH S 165																						
NFH S 166	201	36.8	1018	9.15	0.20	11.21	0.74	10.50	14.92	1.40	45.1	14.73	142.93	42.15	160.5	35.9	388	34.7	7105	6.83	142.6	142.4
NFH S 167																						
NFH S 171																						
NFH S 172	161	6.5	1070	17.05	0.03	17.12	0.07	3.51	7.32	0.69	41.6	11.99	131.46	43.30	161.6	38.6	398	43.1	6987	6.91	99.1	152.7
NFH S 173	155	11.2	1156	15.80	0.02	19.81	0.50	8.43	12.83	2.16	43.1	14.36	145.22	46.44	180.5	42.7	486	44.6	6536	9.67	114.2	229.7
NFH S 174	135	7.3	806	17.74		20.23	0.17	2.99	6.07	0.84	23.1	8.54	100.10	31.35	136.3	33.0	362	33.9	7028	9.01	182.8	281.8
NFH S 175	189	19.0	667	8.82		17.45	0.14	4.95	6.48	1.18	24.6	8.42	83.75	26.82	109.7	26.5	308	28.3	6423	5.06	156.0	179.7

NFH S 177	214	12.9	613	1.50		3.97		1.18	2.78	0.49	15.5	5.43	65.41	24.52	98.1	24.1	294	28.3	7256	0.73	37.0	115.4
NFH S 178																						
NFH S 179	309	14.7	1732	7.28	0.03	46.23	0.47	7.16	11.76	3.01	55.3	17.79	197.56	67.28	283.6	69.9	731	81.3	8528	3.35	265.9	190.0
NFH S 180																						
NFH S 182																						
NFH S 185	99	7.1	2204	34.92	0.12	29.75	0.65	8.65	18.86	2.78	76.8	26.66	303.05	93.73	383.4	88.5	882	84.7	6754	13.34	230.3	355.8
NFH S 186																						
NFH S 187	158	10.5	665	12.86		17.73	0.03	4.57	6.77	1.08	23.1	7.99	85.06	27.95	117.0	29.3	315	30.3	6233	7.73	105.3	177.4
NFH S 191																						
NFH S 192																						
NFH S 195																						
NFH S 196																						
NFH S 197	151	10.2	1546	13.32	0.06	20.42	0.56	10.13	14.40	2.24	51.3	18.84	199.29	65.94	258.2	61.1	615	64.2	7502	7.30	165.6	209.9
NFH S 198																						
NFH S 199	215	7.4	1862	31.32		31.33	0.40	7.68	14.09	3.44	59.6	18.53	218.55	67.05	283.7	63.5	636	65.7	6872	13.34	285.6	372.4
NFH S 201																						
NFH S 203																						
NFH S 206																						
NFH S 207																						
NFH S 208																						
NFH S 210																						
NFH L 211																						
NFH L 212	81	10.8	439	15.23		8.39	0.15	2.19	4.60	0.71	17.5	5.27	61.40	20.56	74.6	18.6	207	21.4	8044	12.93	51.3	120.7
NFH L 214																						

NFH L 217	198	15.6	1093	18.91	0.15	24.69	0.24	6.49	11.01	1.64	41.0	12.40	133.31	41.57	170.0	41.8	437	47.7	8346	10.33	213.3	216.0
NFH L 219	145	3.2	3524	48.48	0.03	24.55	0.22	6.56	13.34	2.20	67.4	27.31	344.53	134.80	613.4	138.7	1358	149.5	13148	27.78	523.3	855.4
NFH L 222	248	14.4	1238	3.38	2.23	11.48	0.65	5.57	6.37	0.40	29.0	9.99	119.75	43.51	199.2	45.9	471	61.9	11802	2.06	111.4	157.1
NFH L 224																						
NFH L 226	97	5.6	1056	14.65		17.90	0.11	5.06	7.10	0.78	31.1	11.17	128.19	43.20	173.0	38.1	373	45.8	9480	6.95	171.0	206.8
NFH L 228	343	18.8	1168	19.36	41.23	73.04	7.87	38.65	13.64	1.96	35.7	11.14	128.60	44.24	189.4	45.0	441	60.5	10568	9.92	110.0	170.2
NFH L 229																						
NFH L 232																						
NFH L150 82																						
NFH L150 91	183	12.2	1037	2.19		5.37	0.12	1.77	2.65	0.42	20.0	7.26	92.64	34.14	147.0	33.3	316	52.5	10961	1.05	77.0	133.5
NFH L150 110	198	10.1	415	0.60		13.19	0.19	2.89	3.70	1.10	15.5	3.88	39.85	13.31	60.6	14.9	149	21.1	9655	0.40	58.9	153.8
NFH L150 112	172	11.2	554	2.05		3.77	0.03	0.74	1.46	0.19	11.1	3.58	46.03	17.94	82.7	19.4	198	28.3	8462	1.13	38.5	102.5
NFH L150 114	776	8.3	2047	1.43		3.96	0.02	1.22	2.91	0.37	30.7	13.24	183.32	69.07	310.4	75.7	743	101.4	10512	0.96	75.6	333.9
NFH L150 116	276	6.4	2763	3.90		17.99	0.27	7.19	14.96	1.33	76.2	22.75	280.08	91.13	385.8	81.9	731	104.8	6676	0.95	92.0	115.0
NFH L150 119	98	1.6	344	0.38		2.42			0.71	0.07	4.6	1.84	22.46	9.66	52.1	14.9	191	33.1	10341	0.30	35.7	134.3
NFH L150 124	245	12.4	1374	4.14		61.16	0.22	4.10	8.50	1.47	39.6	12.56	137.88	46.92	196.2	45.2	418	59.1	9340	1.44	199.8	235.7
NFH L150 126	86	5.9	339	0.20	0.17	0.82	0.04	0.52	3.00	1.33	20.4	4.30	39.59	13.18	41.0	8.9	74	11.1	9872		34.0	125.0
NFH L150 130																						
NFH L150 132																						

NFH L150 139	117	8.6	3497	42.84	0.16	58.42	0.82	15.85	25.56	2.96	122.4	38.50	404.28	131.16	508.4	104.5	842	127.4	8021	13.68	759.6	574.4
NFH L150 140	155	14.1	481	1.06		27.93	0.05	2.16	2.60	0.56	14.5	4.28	43.70	14.35	64.0	14.3	140	23.6	11402	0.39	145.3	139.2
NFH L150 141	210	7.7	1097	11.76	6.61	34.98	2.06	11.05	7.97	1.25	29.2	10.54	119.02	41.12	174.7	36.8	331	51.0	9727	6.28	156.5	236.8
NFH L150 142	171	14.2	1172	2.85	0.06	5.84	0.21	1.44	4.80	0.70	31.2	9.65	111.33	42.61	174.7	38.4	345	55.5	10066	1.28	101.7	159.0
NFH L150 143																						
NFH L150 147	1037	14.6	2497	1.63		10.76	0.14	2.57	6.83	1.46	46.8	17.92	230.76	92.32	400.9	95.8	911	143.9	11031	1.01	80.7	157.9
NFH L150 151																						
NFH L150 152	106	2.9	926	5.17		10.99	0.44	6.74	11.93	0.49	40.0	12.36	128.95	40.93	154.7	33.2	310	44.6	7935	1.95	59.0	59.6
NFH L150 157	133	11.7	505	0.99		4.56		0.20	1.19	0.24	10.1	4.16	48.35	18.53	81.1	19.7	218	30.6	8345	0.78	40.2	93.2
NFH L150 158																						
NFH L150 165																						
NFH L150 168	200	22.0	696	2.83		20.89	0.03	0.30	2.61	0.28	11.6	3.90	60.33	22.27	103.9	26.0	260	41.4	10107	1.38	51.8	52.7
NFH L150 176																						
NFH L150 183																						
NFH L150 184	247	12.7	767	2.59		6.74	0.07	1.09	2.41	0.25	15.6	5.84	75.38	26.49	124.5	28.5	290	39.9	7741	1.47	84.1	164.9
NFH L150 186	188	10.4	757	3.64		7.32	0.03		2.31	0.37	14.8	5.55	68.43	25.85	112.5	26.9	279	37.3	8309	1.71	85.6	183.0
NFH L150 187																						
NFH S150 291	127	8.7	441	0.49		12.68		0.76	1.76	0.48	11.5	3.01	42.01	14.18	64.3	15.4	156	27.6	11638	0.29	94.7	139.0
NFH S150 304																						
NFH S150 306	95	2.7	1229	0.65		4.83	0.06	1.61	3.26	0.50	19.9	6.47	92.62	37.66	174.0	44.1	443	99.9	12558	0.55	93.8	168.5

NFH S150 307	383	6.7	2454	1.02		10.50	0.23	8.09	13.15	3.52	73.8	20.64	246.93	88.28	379.2	76.2	675	124.5	11683	0.36	179.3	203.8
NFH S150 308																						
NFH S150 310																						
NFH S150 315																						
NFH S150 318	123	61.4	482	4.49		4.53	0.14	4.04	3.28	0.82	15.9	5.09	51.64	16.97	77.1	18.4	175	29.1	8345	3.44	176.5	265.5
NFH S150 325																						
NFH S150 329	178	9.4	1974	13.36	0.21	23.55	0.61	9.74	11.96	2.19	65.3	18.27	212.39	75.43	293.7	58.1	476	83.4	10402	7.29	173.2	234.4
NFH S150 331	141	6.5	1256	14.96		26.35	0.13	1.84	5.41	0.61	27.5	9.94	121.66	42.63	194.4	44.6	381	67.5	10014	8.40	119.6	162.2
NFH S150 338	545	13.5	3517	1.32		41.68	0.45	8.33	15.92	6.35	92.0	29.34	334.91	126.61	543.5	119.8	1004	182.2	10348	0.58	122.9	83.5
NFH S150 339																						
NFH S150 340	178	15.0	857	2.58		3.39		0.72	1.99	0.29	16.9	5.85	77.91	30.90	132.7	29.5	257	44.9	10566	1.97	47.2	90.8
NFH S150 343																						
NFH S150 344	302	24.4	720	1.45	0.51	27.30	0.16	2.74	2.92	0.78	18.7	6.53	71.69	26.41	112.8	25.2	238	38.4	11346	0.61	45.7	59.5
NFH S150 345	314	5.8	1922	3.42	0.35	21.37	0.23	3.79	7.33	1.15	39.4	15.32	189.96	70.89	303.8	72.3	665	110.3	10840	1.35	206.7	307.0
NFH S150 347																						
NFH S150 350	264	12.8	1265	3.66	0.02	36.76	0.11	1.70	6.27	1.25	27.3	9.28	116.47	42.78	203.5	50.4	507	87.8	9949	1.13	82.0	184.8
NFH S150 354																						
NFH S150 365	386	14.1	1943	2.36		29.92	0.09	2.83	6.15	1.36	38.5	13.90	185.22	67.72	314.4	66.5	579	106.3	12887	1.41	167.0	151.1
NFH S150 367	227	17.7	1561	1.36		5.69	0.18	2.89	8.53	1.86	44.7	13.97	155.91	54.18	228.9	45.3	396	66.2	10332	1.07	107.5	155.1
NFH S150 369	364	21.2	1068	1.11		22.34	0.10	1.18	4.46	1.85	23.7	8.51	102.15	37.28	165.0	38.5	369	59.0	9197	0.66	70.2	61.7

NFH S150 375	223	16.5	1058	1.64		23.79	0.09	2.10	4.68	1.51	24.5	9.58	105.17	38.52	172.0	38.9	330	60.1	11393	0.60	44.5	57.5
NFH S150 379	175	37.2	631	4.17		10.75	0.26	5.19	8.10	1.06	25.8	7.84	78.68	24.59	91.6	19.0	174	26.1	7796	2.85	70.4	62.0
NFH S150 380	244	12.8	1914	2.75	0.05	6.51	0.58	7.77	12.02	1.25	57.2	19.53	207.00	71.91	289.3	61.1	520	89.4	9334	1.41	84.2	99.6
NFH S150 383																						
NFH S150 384																						
NFH S150 385																						
NFH S150 387																						
NFH S 151																						
NFH S 154																						
NFH S 156	181	9.7	735	16.06		20.81	0.04	3.13	5.43	0.89	25.8	7.99	87.28	28.48	118.8	29.5	329	31.9	7521	9.12	126.2	245.0
NFH S 158																						
NFH S 159																						
NFH S 163	212	14.7	742	2.88		6.60	0.03	1.15	3.31	0.46	18.3	6.43	77.26	28.85	124.2	30.8	354	33.6	8047	1.77	76.7	161.4
NFH S 164																						
NFH S 168	127	11.5	1074	19.92		28.98	0.47	7.18	11.44	1.56	42.1	13.46	143.49	44.58	174.5	39.8	442	40.4	5820	8.16	241.7	255.9
NFH S 169																						
NFH S 170																						
NFH S 176																						
NFH S 184	174	5.3	2682	180.56		290.75	0.36	6.91	15.87	1.06	82.3	29.60	348.55	108.91	404.1	91.8	970	79.1	5400	41.90	635.7	778.3
NFH S 189																						
NFH S 190																						
NFH S 202																						
NFH S 204																						

NFH L 223	102	2.6	2970	14.92	0.79	24.07	0.28	3.58	9.89	1.65	56.3	24.59	313.06	114.97	495.6	121.4	1187	129.0	8178	6.23	551.0	297.9
NFH L 233																						
NFH L150 86	88	2.4	493	3.32	0.03	6.18	0.02	0.61	1.21	0.15	7.7	2.40	35.21	14.85	67.7	15.3	160	30.6	15007	1.74	178.9	462.2
NFH L150 96	186	5.6	834	2.44	0.06	26.78	0.15	2.36	4.65	1.52	21.8	6.94	74.51	28.40	125.3	30.8	308	61.6	12379	1.01	290.5	348.0
NFH L150 101																						
NFH L150 106																						
NFH L150 107	91	9.7	2269	34.77	0.38	43.89	0.57	8.04	16.85	2.06	73.7	24.09	268.41	89.62	349.7	75.4	668	89.8	6674	12.26	366.4	389.6
NFH L150 118	117	6.3	4635	42.51	9.18	88.60	3.92	42.19	59.31	5.20	185.8	56.03	590.01	178.31	660.2	142.3	1207	144.1	5475	10.13	472.1	483.1
NFH L150 120	380	9.3	3326	53.20	0.02	27.21	0.36	8.45	16.15	0.42	75.7	28.00	341.14	120.85	488.6	106.4	995	126.3	8193	17.18	516.7	673.0
NFH L150 127																						
NFH L150 128	278	17.5	1200	1.49	0.03	2.94	0.47	7.62	11.74	4.02	53.6	16.23	135.05	42.09	162.2	34.3	339	50.3	6179	0.43	69.7	73.3
NFH L150 136																						
NFH L150 138																						
NFH L150 144																						
NFH L150 155																						
NFH L150 159	425	12.8	1249	5.56	2.19	25.85	1.42	12.29	10.50	3.45	30.1	10.96	125.65	45.31	210.7	53.9	552	79.6	11705	5.11	366.1	1274.6
NFH L150 162	169	5.3	950	4.92	0.07	36.72	0.42	7.42	10.56	1.78	32.9	10.12	103.58	35.50	141.2	34.6	356	50.1	10762	3.86	485.1	881.3
NFH L150 163	222	11.2	1607	6.77	0.08	12.24	0.22	3.88	7.95	0.76	37.3	12.64	159.71	55.40	244.8	56.0	546	78.1	9414	6.30	323.4	690.8
NFH L150 164																						
NFH L150 166	1048	4.8	3297	3.09		2.86	0.03	1.35	4.24	0.06	39.6	18.51	268.37	114.43	538.8	119.7	1096	201.5	15023	2.92	142.9	936.0
NFH L150 169																						

NFH L150 170	283	5.9	1580	13.24	0.48	30.12	0.27	4.36	6.19	1.27	39.4	12.64	150.50	54.61	244.4	58.1	560	88.6	12028	3.47	256.0	213.8
NFH L150 180																						
NFH L150 181	227	4.1	907	4.56	0.02	32.24	0.34	3.47	5.59	1.71	23.3	7.51	89.23	32.03	138.9	35.0	325	50.8	10827	2.84	221.6	412.5
NFH L150 182	430	17.5	2789	8.61	0.53	189.47	1.56	22.17	36.01	9.28	125.0	31.23	310.44	100.21	383.0	85.2	760	102.4	8230	2.12	1835.7	721.4
NFH L150 188	163	10.0	863	14.97	0.07	18.17	0.23	3.00	5.45	1.31	23.0	7.63	96.57	32.38	138.5	31.4	300	39.7	6701	6.72	147.6	300.9
NFH S150 287																						
NFH S150 290																						
NFH S150 292																						
NFH S150 293																						
NFH S150 294																						
NFH S150 296	484	9.2	2382	5.25	0.56	68.33	1.33	19.62	21.72	8.25	75.7	21.22	218.52	76.88	362.0	82.2	801	145.5	12861	2.36	484.7	374.1
NFH S150 297																						
NFH S150 299																						
NFH S150 300	117	49.5	1431	2.91	0.19	9.54	0.77	13.68	17.42	3.16	57.0	16.69	170.49	52.23	198.3	37.6	311	52.0	8617	2.44	172.3	135.7
NFH S150 301																						
NFH S150 305	162	12.5	2010	16.62	0.46	25.52	0.52	9.00	12.72	2.10	58.4	19.84	212.76	71.78	309.3	59.3	506	88.2	9809	7.48	212.2	249.0
NFH S150 311	250	9.9	1037	4.18		9.81	0.10	1.87	2.39	0.13	19.2	7.47	89.63	36.51	161.4	36.8	341	60.7	11908	2.07	137.8	247.7
NFH S150 313	163	44.7	825	7.86	0.97	15.91	0.41	5.32	7.64	1.06	30.1	9.03	96.78	29.65	121.3	26.3	223	34.1	8880	3.60	130.7	101.2
NFH S150 314	253	14.1	1598	13.23	0.61	26.84	0.72	10.74	15.07	3.04	61.9	18.07	186.13	63.24	237.8	50.8	448	67.0	7783	6.15	168.7	220.9
NFH S150 316	206	13.0	1816	14.92	0.10	25.28	0.63	9.34	13.49	2.96	63.2	18.66	212.20	67.82	268.0	59.4	501	74.3	8555	6.12	190.9	239.6
NFH S150 319																						

NFH S150 320	589	17.3	1920	2.16	0.22	9.05	0.22	3.24	6.69	0.87	48.4	15.51	194.71	70.72	308.2	68.4	584	98.9	14120	1.33	222.2	310.9
NFH S150 327	197	14.4	1060	0.63		13.83	0.12	2.51	4.70	1.19	23.2	7.77	94.35	36.05	162.0	34.2	314	61.7	10371	0.27	105.9	134.7
NFH S150 328	162	16.8	861	7.00		16.93	0.23	3.21	4.81	0.94	23.6	7.52	88.06	30.55	131.7	28.6	237	43.9	10487	4.09	126.0	143.8
NFH S150 332																						
NFH S150 333																						
NFH S150 335	245	11.5	1640	20.17	0.76	28.81	0.63	7.41	10.25	1.59	44.4	15.26	165.00	58.21	245.1	50.7	436	73.8	9292	9.39	206.5	274.8
NFH S150 336																						
NFH S150 342																						
NFH S150 346																						
NFH S150 348	309	53.7	1063	72.05	11.54	34.50	4.04	27.11	20.26	4.86	59.5	16.28	145.27	39.81	148.4	31.5	270	36.4	8157	5.32	267.6	252.6
NFH S150 349	287	13.8	2353	19.39	0.14	32.75	0.82	12.37	23.09	4.45	90.6	26.65	288.25	91.60	350.6	72.0	643	88.3	7910	8.67	291.0	320.8
NFH S150 351																						
NFH S150 352																						
NFH S150 353	85	4.0	3730	22.71	0.31	39.16	0.82	18.00	35.85	2.78	152.5	47.55	497.77	160.93	590.6	115.8	939	118.9	6188	7.63	204.5	326.8
NFH S150 355																						
NFH S150 356																						
NFH S150 358	216	10.6	1356	22.92	0.08	32.79	0.25	6.33	8.87	1.14	37.3	13.29	154.55	50.30	205.0	43.8	400	62.1	9481	11.29	374.3	395.9
NFH S150 361																						
NFH S150 362																						
NFH S150 364	213	13.9	1371	23.73	2.01	37.33	0.51	5.14	8.03	0.99	39.8	12.64	142.26	49.80	213.5	44.3	363	61.5	8990	8.96	257.4	285.0
NFH S150 368	241	14.1	1611	1.89		7.15	0.30	5.28	9.04	2.09	53.5	15.94	173.04	58.56	241.7	50.5	437	70.3	10677	1.09	134.3	176.0
NFH S150 371																						

NFH S150 374	52	5.1	2878	10.18	0.04	17.18	0.84	12.83	28.32	1.07	126.1	34.51	386.29	117.36	446.9	87.5	698	110.1	7175	4.53	225.2	223.7
NFH S150 376	254	34.2	1139	3.81	0.12	11.21	0.70	8.28	10.87	1.93	38.4	12.01	130.20	41.83	164.2	35.1	300	53.2	9486	2.32	181.9	96.9
NFH S150 377	173	31.9	482	3.21		9.23	0.06	2.69	5.29	0.91	13.8	4.98	54.12	17.85	70.1	14.7	136	21.9	8965	1.36	54.3	49.3
NFH S150 378																						
NFH S150 382																						
NFH S150 389	227	10.0	3125	90.92	13.92	140.96	4.17	20.30	24.56	5.23	122.4	37.17	411.85	126.57	463.0	97.0	834	106.4	5757	26.93	872.9	914.4
NFH S150 390																						
NFH S150 391																						

APPENDIX 3D:

BSU zircon CA-IDTIMS U-Pb geochronology

	Compositional Parameters						Radiogenic Isotope Ratios									Isotopic Ages					
Sample	Th U	^{206}Pb* x10^{-13} mol	mol % ^{206}Pb*	Pb* Pbc	Pbc (pg)	^{206}Pb/^{204}Pb	^{208}Pb/^{206}Pb	^{207}Pb/^{206}Pb	% err	^{207}Pb/^{235}U	% err	^{206}Pb/^{238}U	% err	corr. coef.	^{207}Pb/^{206}Pb	±	^{207}Pb/^{235}U	±	^{206}Pb/^{238}U	±
(a)	(b)	(c)	(c)	(c)	(c)	(d)	(e)	(e)	(f)	(e)	(f)	(e)	(f)		(g)	(f)	(g)	(f)	(g)	(f)
67PL09																				
z2a	0.470	0.1531	96.70	9	0.43	546	0.146	0.061989	0.653	0.941938	0.736	0.110206	0.172	0.572	673.74	13.97	673.90	3.62	673.94	1.10
z2b	0.427	0.0453	93.05	4	0.28	260	0.132	0.060722	2.151	0.923623	2.301	0.110319	0.504	0.398	629.39	46.33	664.27	11.22	674.60	3.23
z3	0.833	0.4219	98.80	27	0.43	1502	0.258	0.062198	0.235	0.960085	0.285	0.111953	0.084	0.698	680.91	5.02	683.34	1.42	684.08	0.54
z5	0.482	0.2862	96.70	9	0.81	546	0.149	0.061740	0.599	0.938577	0.669	0.110256	0.122	0.631	665.12	12.83	672.14	3.29	674.23	0.78
z6	0.434	0.4515	98.15	16	0.70	978	0.134	0.061918	0.333	0.943856	0.386	0.110557	0.084	0.694	671.29	7.13	674.90	1.91	675.98	0.54
z7a	0.463	0.2850	98.61	21	0.33	1301	0.143	0.062190	0.290	0.946930	0.345	0.110433	0.102	0.641	680.65	6.20	676.50	1.70	675.26	0.66
z7b	0.375	0.2091	98.52	20	0.26	1222	0.116	0.062003	0.319	0.944177	0.379	0.110444	0.120	0.617	674.20	6.82	675.07	1.87	675.32	0.77
z8	0.629	0.7756	99.35	48	0.42	2769	0.195	0.062102	0.142	0.945231	0.193	0.110390	0.070	0.804	677.64	3.04	675.62	0.95	675.01	0.45
z9	0.751	0.1308	93.91	5	0.70	296	0.233	0.062242	1.228	0.955820	1.372	0.111376	0.343	0.523	682.43	26.23	681.13	6.81	680.74	2.21

z10a	0.660	0.0649	92.89	4	0.41	254	0.204	0.063465	1.429	0.966827	1.595	0.110488	0.410	0.512	723.84	30.31	686.83	7.96	675.58	2.63
z10b	0.701	0.0685	90.43	3	0.60	189	0.217	0.061437	1.929	0.933648	2.105	0.110217	0.344	0.572	654.58	41.39	669.55	10.32	674.01	2.20
z11a	0.885	0.4189	96.84	10	1.13	572	0.274	0.062486	0.493	0.967806	0.554	0.112332	0.095	0.698	690.80	10.51	687.33	2.77	686.27	0.62
z11b	0.904	0.2820	99.00	33	0.24	1801	0.280	0.062436	0.222	0.966864	0.280	0.112312	0.104	0.682	689.08	4.74	686.85	1.40	686.16	0.67
z12	1.098	0.0373	88.75	3	0.39	160	0.340	0.062873	2.976	0.969184	3.171	0.111799	0.609	0.406	703.94	63.32	688.04	15.84	683.19	3.95
z13a	4.026	1.5432	99.86	419	0.18	13139	1.247	0.062362	0.090	0.965916	0.142	0.112335	0.067	0.869	686.56	1.92	686.36	0.71	686.30	0.44
z13b	3.468	0.2197	98.38	32	0.30	1111	1.074	0.061887	0.368	0.960218	0.430	0.112530	0.130	0.595	670.20	7.88	683.41	2.14	687.43	0.85
z14a	0.705	0.3373	99.08	34	0.26	1969	0.219	0.062198	0.207	0.959046	0.259	0.111830	0.094	0.682	680.93	4.42	682.80	1.29	683.37	0.61
z15	0.832	0.3590	99.47	62	0.16	3416	0.258	0.062060	0.166	0.945372	0.217	0.110482	0.088	0.715	676.17	3.54	675.69	1.07	675.54	0.57
z16	0.538	0.3747	98.56	21	0.45	1252	0.167	0.062037	0.293	0.944483	0.345	0.110419	0.091	0.666	675.38	6.25	675.23	1.70	675.18	0.58
z17	1.580	0.6581	99.40	64	0.33	2999	0.489	0.062250	0.155	0.965580	0.210	0.112499	0.096	0.731	682.71	3.30	686.18	1.05	687.24	0.62
67PL09 Bulk Mount																				
z1	0.389	0.2335	93.04	4	1.46	256	0.121	0.061755	0.550	0.941567	0.613	0.110581	0.133	0.558	665.62	11.79	673.70	3.02	676.12	0.85
z5	0.652	0.4020	99.10	35	0.30	2007	0.202	0.062240	0.220	0.963540	0.268	0.112280	0.087	0.666	682.35	4.69	685.13	1.33	685.97	0.56
z6	0.833	0.0554	93.56	5	0.32	280	0.258	0.062504	1.541	0.965366	1.678	0.112016	0.380	0.458	691.41	32.87	686.07	8.37	684.44	2.47
z7	0.709	0.4794	99.34	48	0.26	2730	0.220	0.062284	0.164	0.960764	0.213	0.111877	0.079	0.740	683.87	3.49	683.69	1.06	683.64	0.51

z8	0.357	0.0346	92.61	4	0.23	244	0.111	0.060142	2.249	0.909323	2.417	0.109658	0.568	0.402	608.68	48.63	656.70	11.69	670.76	3.62
z9	0.670	0.9967	99.61	81	0.32	4648	0.208	0.062130	0.108	0.945498	0.161	0.110372	0.069	0.855	678.59	2.31	675.76	0.79	674.91	0.44
z10	1.205	0.0728	96.91	11	0.19	585	0.373	0.061677	0.844	0.939935	0.950	0.110529	0.293	0.497	662.92	18.07	672.85	4.67	675.82	1.88
z11a	3.220	0.0399	91.87	6	0.29	222	0.997	0.062243	1.851	0.959832	2.025	0.111842	0.552	0.438	682.47	39.54	683.21	10.07	683.43	3.58
z11b	1.708	0.0778	94.27	7	0.39	315	0.529	0.062495	1.144	0.965925	1.254	0.112098	0.284	0.484	691.08	24.40	686.36	6.26	684.92	1.84
68PL09																				
z1a	0.531	0.1819	96.39	8	0.56	500	0.165	0.061369	0.689	0.935793	0.763	0.110594	0.175	0.518	652.19	14.79	670.68	3.75	676.20	1.12
z2	0.553	0.0313	83.96	2	0.50	112	0.172	0.054885	9.745	0.824170	9.995	0.108908	0.821	0.342	407.56	218.05	610.37	45.85	666.40	5.20
z1b	0.494	0.0765	89.07	2	0.78	165	0.153	0.062512	2.358	0.953433	2.520	0.110617	0.383	0.485	691.68	50.28	679.89	12.49	676.33	2.46
z5	0.586	0.0580	94.69	6	0.27	340	0.182	0.062330	1.261	0.950314	1.390	0.110577	0.383	0.460	685.46	26.91	678.27	6.88	676.10	2.46
z6	0.798	0.0686	91.67	4	0.52	217	0.247	0.063194	1.586	0.963770	1.720	0.110611	0.337	0.479	714.77	33.70	685.25	8.57	676.29	2.17
z7	0.526	0.3284	91.03	3	2.71	198	0.163	0.062218	0.739	0.949727	0.808	0.110709	0.144	0.553	681.60	15.78	677.96	4.00	676.87	0.92
z8	0.486	0.1847	94.75	5	0.85	344	0.151	0.061985	0.927	0.943964	1.008	0.110450	0.160	0.561	673.60	19.83	674.95	4.97	675.36	1.03
z9	0.445	0.1670	90.64	3	1.44	191	0.138	0.062991	1.320	0.962467	1.427	0.110817	0.201	0.586	707.93	28.06	684.57	7.11	677.49	1.29
z10	0.442	0.2341	97.38	11	0.52	689	0.137	0.061916	0.493	0.943125	0.551	0.110475	0.122	0.565	671.22	10.54	674.52	2.72	675.50	0.79
z12	0.584	0.2411	97.49	12	0.52	719	0.181	0.061673	0.470	0.939069	0.527	0.110434	0.119	0.569	662.79	10.07	672.39	2.59	675.26	0.76

z13	0.788	0.4088	98.22	18	0.61	1016	0.244	0.062250	0.330	0.949528	0.377	0.110628	0.085	0.632	682.71	7.04	677.86	1.87	676.40	0.55
66PL09																				
z1a	0.464	0.6061	97.43	11	1.33	704	0.144	0.063055	0.350	0.994867	0.405	0.114431	0.084	0.711	710.09	7.44	701.20	2.05	698.43	0.55
z1b	0.490	0.1953	95.83	7	0.71	433	0.152	0.063286	0.800	1.000055	0.889	0.114608	0.169	0.594	717.86	16.98	703.84	4.51	699.45	1.12
z2a	0.888	0.2595	97.14	11	0.63	631	0.275	0.062743	0.537	0.990468	0.604	0.114491	0.123	0.616	699.54	11.43	698.96	3.05	698.78	0.81
z2b	0.966	0.2980	96.66	10	0.86	539	0.299	0.063175	0.607	0.996695	0.680	0.114423	0.119	0.662	714.13	12.90	702.13	3.45	698.39	0.79
z2c	0.925	1.0639	98.71	26	1.15	1403	0.286	0.062774	0.212	0.990455	0.259	0.114434	0.072	0.740	700.57	4.51	698.95	1.31	698.45	0.48
z3	0.868	1.6046	99.76	138	0.32	7511	0.268	0.062987	0.078	1.004368	0.138	0.115649	0.066	0.945	707.78	1.66	706.02	0.70	705.47	0.44
z4a	0.760	1.2922	99.49	63	0.55	3516	0.235	0.062417	0.115	0.966570	0.168	0.112313	0.068	0.857	688.43	2.45	686.69	0.84	686.16	0.44
z4b	0.683	1.3752	99.74	122	0.30	6948	0.212	0.062403	0.090	0.966127	0.145	0.112287	0.067	0.899	687.95	1.91	686.47	0.72	686.01	0.43
z5	0.869	12.9285	99.89	310	1.15	16923	0.269	0.062759	0.067	0.990632	0.128	0.114482	0.065	0.961	700.07	1.44	699.04	0.65	698.72	0.43
z6a	0.560	0.7675	99.49	60	0.32	3559	0.173	0.062854	0.119	0.993695	0.172	0.114662	0.071	0.841	703.28	2.52	700.60	0.87	699.77	0.47
z6b	0.486	1.3280	99.73	109	0.30	6562	0.150	0.062810	0.084	0.993528	0.141	0.114722	0.066	0.929	701.82	1.79	700.52	0.72	700.11	0.44
z7	0.773	0.5539	99.07	34	0.43	1939	0.240	0.062012	0.187	0.943532	0.238	0.110353	0.078	0.742	674.51	4.00	674.73	1.17	674.80	0.50
z8	0.620	0.3403	98.80	26	0.34	1508	0.192	0.062336	0.237	0.949536	0.291	0.110476	0.094	0.682	685.67	5.05	677.86	1.44	675.51	0.60
z9	0.281	0.2550	88.12	2	2.85	153	0.087	0.063081	0.967	0.998267	1.060	0.114776	0.186	0.563	710.95	20.55	702.93	5.37	700.42	1.24

z11	0.411	0.0931	93.04	4	0.58	259	0.127	0.063009	1.399	0.998529	1.536	0.114937	0.283	0.553	708.53	29.76	703.06	7.79	701.35	1.88
z12	0.893	0.8520	99.11	37	0.64	2023	0.276	0.062796	0.173	0.988926	0.221	0.114216	0.072	0.759	701.34	3.69	698.17	1.12	697.19	0.47
z13	0.964	0.1623	98.43	21	0.21	1153	0.298	0.062742	0.338	1.000754	0.410	0.115683	0.150	0.623	699.49	7.20	704.19	2.08	705.67	1.00
z14a	1.659	14.5536	99.98	2135	0.22	98159	0.513	0.062903	0.061	0.999758	0.122	0.115272	0.064	0.984	704.95	1.29	703.69	0.62	703.29	0.42
z14b	1.334	20.0045	99.99	3340	0.18	164068	0.413	0.062910	0.040	1.000468	0.082	0.115341	0.045	0.978	705.19	0.85	704.05	0.42	703.69	0.30
FH-DZ2																				
z29	0.910	0.1050	91.82	4	0.78	221	0.282	0.061581	1.591	0.923256	1.749	0.108737	0.315	0.570	659.57	34.10	664.08	8.52	665.41	1.99
z30B	0.741	0.3384	97.22	11	0.80	649	0.230	0.062157	0.484	0.955047	0.551	0.111437	0.128	0.610	679.53	10.33	680.73	2.73	681.09	0.83
z31	0.577	0.6687	99.11	34	0.50	2031	0.179	0.062253	0.170	0.959085	0.227	0.111737	0.091	0.748	682.80	3.63	682.82	1.13	682.83	0.59
z97B	0.572	0.7700	98.66	23	0.87	1341	0.177	0.061983	0.248	0.944561	0.311	0.110523	0.121	0.662	673.54	5.30	675.27	1.53	675.79	0.78
NFH																				
z1	0.572	0.1009	96.84	9	0.27	571	0.177	0.062054	0.660	0.960679	0.752	0.112281	0.222	0.538	675.97	14.10	683.65	3.74	685.98	1.44
z3	0.827	0.4353	98.84	28	0.43	1549	0.256	0.061827	0.240	0.924039	0.290	0.108395	0.085	0.692	668.15	5.13	664.49	1.42	663.42	0.53
z4	0.480	0.5979	99.21	38	0.40	2282	0.149	0.061904	0.175	0.941980	0.223	0.110362	0.074	0.752	670.81	3.73	673.92	1.10	674.85	0.48
z5a	1.899	0.2628	98.39	25	0.36	1123	0.589	0.062058	0.341	0.943596	0.398	0.110278	0.106	0.629	676.10	7.30	674.76	1.96	674.36	0.68
z5b	0.685	0.0492	92.91	4	0.31	255	0.212	0.062269	1.920	0.949928	2.054	0.110641	0.405	0.419	683.36	40.99	678.07	10.16	676.47	2.60

z6a	0.616	0.5186	99.29	43	0.31	2530	0.191	0.062003	0.160	0.944151	0.212	0.110440	0.079	0.769	674.21	3.41	675.05	1.05	675.30	0.51
z6b	0.438	0.4885	99.30	42	0.29	2569	0.136	0.061998	0.158	0.944150	0.211	0.110449	0.080	0.766	674.05	3.38	675.05	1.04	675.35	0.51
z7	0.447	0.2245	98.43	19	0.30	1147	0.139	0.061992	0.346	0.944061	0.404	0.110450	0.117	0.606	673.83	7.40	675.01	1.99	675.36	0.75
z8	0.411	0.1240	97.82	13	0.23	827	0.128	0.061938	0.551	0.943289	0.630	0.110456	0.181	0.553	671.95	11.79	674.60	3.10	675.39	1.16
z9	0.640	0.6781	99.44	56	0.32	3228	0.198	0.062038	0.142	0.944871	0.195	0.110462	0.074	0.800	675.42	3.04	675.43	0.96	675.43	0.48
z10	0.446	0.2621	98.95	28	0.23	1721	0.138	0.061904	0.233	0.942305	0.288	0.110401	0.102	0.664	670.79	4.98	674.09	1.42	675.08	0.65
z11	0.550	0.1382	97.87	14	0.25	849	0.170	0.061476	0.630	0.936475	0.705	0.110482	0.188	0.512	655.92	13.51	671.04	3.46	675.55	1.21
z12	0.513	0.2282	97.03	10	0.58	608	0.159	0.062181	0.544	0.947310	0.616	0.110492	0.112	0.701	680.36	11.61	676.70	3.04	675.60	0.72
z13	0.415	0.1884	98.40	18	0.25	1130	0.129	0.061805	0.335	0.940455	0.397	0.110360	0.124	0.618	667.38	7.16	673.12	1.95	674.84	0.79
NFH Bulk Mount																				
z1	0.669	0.0418	93.90	5	0.23	296	0.207	0.059958	2.090	0.912890	2.227	0.110426	0.480	0.385	602.05	45.23	658.59	10.79	675.22	3.08
z2	0.736	0.0218	88.19	2	0.24	153	0.228	0.058691	6.860	0.908634	7.081	0.112283	1.084	0.277	555.65	149.63	656.33	34.23	686.00	7.05
z3	0.495	0.3934	99.33	44	0.22	2674	0.154	0.062188	0.156	0.948829	0.208	0.110657	0.083	0.749	680.58	3.33	677.49	1.03	676.56	0.53
z4	0.959	0.0796	96.70	10	0.23	547	0.297	0.061624	0.727	0.955187	0.829	0.112419	0.274	0.514	661.07	15.58	680.80	4.11	686.78	1.79
z8	0.491	0.0614	94.29	5	0.31	316	0.152	0.061175	1.346	0.924719	1.476	0.109632	0.375	0.456	645.38	28.93	664.85	7.20	670.61	2.39
z9	0.606	0.0462	93.68	5	0.26	285	0.187	0.062127	1.556	0.981888	1.701	0.114625	0.466	0.435	678.50	33.26	694.57	8.56	699.55	3.09

z11	0.593	0.1232	97.66	13	0.24	771	0.184	0.061842	0.530	0.941671	0.601	0.110437	0.176	0.529	668.64	11.34	673.76	2.96	675.29	1.13
z12	0.361	0.1661	97.32	11	0.38	673	0.112	0.060514	0.554	0.833683	0.622	0.099918	0.137	0.574	622.00	11.96	615.65	2.87	613.93	0.80
z14a	0.526	0.2208	98.46	19	0.29	1169	0.163	0.061519	0.349	0.935528	0.402	0.110293	0.112	0.582	657.42	7.48	670.54	1.97	674.45	0.72
z14b	0.512	0.3584	99.20	37	0.24	2247	0.159	0.061994	0.204	0.943187	0.252	0.110343	0.087	0.673	673.92	4.36	674.55	1.24	674.74	0.56
z15	0.538	0.0665	95.75	7	0.24	424	0.167	0.061668	1.167	0.938785	1.275	0.110410	0.339	0.438	662.60	25.00	672.25	6.27	675.13	2.18
z18	0.892	0.0959	97.32	12	0.22	673	0.276	0.061449	0.661	0.946585	0.750	0.111723	0.253	0.502	655.00	14.17	676.32	3.70	682.75	1.64
z19	6.213	0.0133	84.38	4	0.20	116	1.922	0.058703	11.809	0.928317	11.979	0.114692	1.474	0.176	556.10	257.60	666.75	58.56	699.94	9.78
z20	0.607	0.0767	95.12	6	0.33	370	0.188	0.061433	1.091	0.953102	1.196	0.112522	0.287	0.470	654.42	23.40	679.72	5.92	687.38	1.87
z21	0.636	0.0880	96.76	9	0.24	558	0.197	0.061922	0.834	0.943007	0.923	0.110450	0.249	0.474	671.43	17.85	674.45	4.55	675.36	1.60
z22	0.456	0.0492	96.01	7	0.17	453	0.141	0.061317	1.136	0.935227	1.260	0.110620	0.401	0.454	650.38	24.39	670.38	6.18	676.35	2.58
65PL09																				
z1a	0.719	0.1315	97.28	11	0.31	662	0.223	0.062692	0.548	0.986190	0.628	0.114090	0.176	0.568	697.79	11.67	696.77	3.17	696.46	1.16
z1b	0.669	0.6789	98.96	30	0.59	1730	0.207	0.062709	0.202	0.985076	0.250	0.113930	0.076	0.731	698.38	4.30	696.20	1.26	695.53	0.50
z2	0.471	1.1013	99.42	51	0.54	3090	0.146	0.062770	0.132	0.990347	0.182	0.114429	0.070	0.809	700.44	2.81	698.90	0.92	698.42	0.46
z3a	0.516	0.8290	99.22	39	0.54	2324	0.160	0.062787	0.151	0.990820	0.201	0.114453	0.071	0.798	701.01	3.21	699.14	1.02	698.56	0.47
z3b	0.413	0.0750	89.97	3	0.69	180	0.128	0.062463	2.308	0.983687	2.474	0.114218	0.339	0.541	689.99	49.23	695.49	12.46	697.20	2.24

z4	0.697	0.0550	89.18	3	0.55	167	0.216	0.061520	2.661	0.969323	2.867	0.114276	0.562	0.452	657.45	57.06	688.11	14.33	697.53	3.71
z5	0.909	0.0877	94.25	5	0.44	314	0.281	0.063007	1.362	1.010086	1.488	0.116269	0.313	0.490	708.48	28.97	708.92	7.59	709.06	2.10
z6	0.568	0.0681	73.58	1	2.03	69	0.176	0.063056	3.821	0.981045	4.058	0.112839	0.496	0.525	710.13	81.22	694.14	20.40	689.21	3.24
z8	1.065	0.2751	96.35	9	0.87	494	0.330	0.062968	0.636	0.995151	0.709	0.114623	0.116	0.679	707.13	13.52	701.35	3.59	699.54	0.77
z9	1.590	0.1883	96.90	12	0.50	581	0.492	0.062377	0.577	0.961656	0.654	0.111814	0.153	0.588	687.04	12.31	684.15	3.25	683.28	0.99
72PL09																				
z1a	0.555	10.7468	99.94	520	0.53	30598	0.172	0.062255	0.057	0.959621	0.123	0.111795	0.066	1.000	682.88	1.21	683.10	0.61	683.17	0.43
z1b	0.835	28.6773	99.98	1463	0.53	80365	0.259	0.062737	0.037	0.988976	0.083	0.114330	0.048	0.987	699.32	0.78	698.20	0.42	697.85	0.32
z1b	0.835	28.7599	99.98	1518	0.52	83382	0.258	0.062686	0.060	0.991010	0.122	0.114659	0.064	0.987	697.58	1.28	699.24	0.62	699.75	0.42
z2a	0.804	3.6118	99.68	102	0.96	5649	0.249	0.062957	0.085	1.003425	0.142	0.115595	0.065	0.934	706.79	1.81	705.55	0.72	705.16	0.43
z2b	0.802	2.4140	99.74	126	0.52	6989	0.248	0.063001	0.085	1.003157	0.143	0.115484	0.067	0.918	708.25	1.81	705.41	0.73	704.52	0.45
z3	0.652	26.1005	99.98	1766	0.39	101372	0.202	0.062375	0.041	0.965074	0.084	0.112214	0.046	0.966	687.00	0.88	685.92	0.42	685.59	0.30
z4a	0.834	7.6169	99.93	474	0.44	26058	0.258	0.062676	0.063	0.990133	0.124	0.114575	0.063	0.983	697.26	1.34	698.79	0.63	699.26	0.42
z4b	0.507	7.7878	99.93	459	0.43	27323	0.157	0.062288	0.064	0.961388	0.125	0.111942	0.064	0.975	684.01	1.36	684.02	0.62	684.02	0.42
z4c	0.537	7.5484	99.91	353	0.54	20897	0.166	0.062276	0.064	0.961061	0.125	0.111925	0.064	0.979	683.60	1.37	683.85	0.62	683.92	0.41
z5	0.729	1.0493	99.03	33	0.85	1869	0.226	0.061577	0.184	0.912532	0.232	0.107481	0.071	0.756	659.44	3.95	658.40	1.13	658.10	0.45

z6a	0.669	0.8105	99.37	50	0.43	2856	0.207	0.062779	0.137	0.992335	0.191	0.114641	0.072	0.828	700.77	2.92	699.91	0.97	699.65	0.48
z6b	0.625	0.4033	98.81	26	0.40	1514	0.193	0.062598	0.246	0.988761	0.297	0.114558	0.089	0.674	694.62	5.24	698.09	1.50	699.17	0.59
z8	1.178	1.0981	99.72	126	0.26	6405	0.365	0.062902	0.086	1.001565	0.144	0.115482	0.067	0.926	704.91	1.82	704.60	0.73	704.51	0.45
z9	0.907	0.7266	99.55	74	0.27	4001	0.281	0.062845	0.108	0.998140	0.165	0.115191	0.073	0.866	703.00	2.29	702.87	0.84	702.82	0.49
z10	1.008	0.5330	99.33	51	0.30	2697	0.312	0.062590	0.157	0.987456	0.208	0.114422	0.081	0.749	694.34	3.34	697.42	1.05	698.38	0.54
73PL09																				
z2a	0.668	1.9726	99.78	146	0.35	8352	0.207	0.062889	0.080	0.997127	0.138	0.114993	0.066	0.929	704.49	1.71	702.35	0.70	701.68	0.44
z2b	0.790	2.6058	99.83	195	0.36	10833	0.245	0.062416	0.073	0.966522	0.132	0.112309	0.065	0.954	688.39	1.55	686.67	0.66	686.14	0.42
z3	0.811	1.2813	98.30	19	1.85	1048	0.251	0.062416	0.153	0.962572	0.206	0.111850	0.071	0.814	688.39	3.27	684.63	1.02	683.48	0.46
z4a	0.620	23.8710	99.98	1476	0.42	85380	0.192	0.062844	0.061	0.997436	0.123	0.115113	0.064	0.982	702.94	1.30	702.51	0.62	702.37	0.43
z4b	0.637	22.1603	99.98	1544	0.37	88970	0.197	0.062861	0.043	0.996655	0.085	0.114991	0.046	0.954	703.52	0.91	702.11	0.43	701.67	0.31
z5a	0.777	1.8317	99.69	104	0.48	5785	0.241	0.062453	0.089	0.967920	0.145	0.112405	0.066	0.912	689.65	1.90	687.39	0.72	686.70	0.43
z5b	0.343	1.1066	99.55	64	0.42	4005	0.106	0.062386	0.106	0.966265	0.159	0.112332	0.067	0.873	687.38	2.26	686.54	0.80	686.28	0.44
z5c	0.376	0.6914	99.39	47	0.35	2941	0.116	0.062431	0.134	0.966497	0.185	0.112279	0.074	0.794	688.90	2.86	686.66	0.92	685.97	0.48
z6a	1.321	0.7422	99.48	70	0.32	3485	0.409	0.062365	0.117	0.963760	0.170	0.112080	0.071	0.848	686.65	2.49	685.24	0.85	684.81	0.46
z6b	1.226	1.0986	99.50	72	0.46	3628	0.380	0.062391	0.145	0.963927	0.191	0.112052	0.070	0.771	687.55	3.09	685.33	0.95	684.65	0.45

z7	0.784	5.4644	99.76	132	1.11	7336	0.243	0.062747	0.070	0.990017	0.130	0.114433	0.064	0.971	699.66	1.49	698.73	0.66	698.44 0.42
z8	0.761	3.0486	99.81	170	0.48	9507	0.236	0.062700	0.096	0.989356	0.145	0.114441	0.066	0.849	698.08	2.04	698.39	0.73	698.49 0.44
z9a	0.592	0.4328	99.00	31	0.36	1812	0.183	0.062360	0.198	0.966607	0.247	0.112420	0.083	0.699	686.47	4.23	686.71	1.23	686.79 0.54
z9b	0.623	4.6901	99.92	385	0.32	22275	0.193	0.062412	0.043	0.966730	0.085	0.112339	0.045	0.972	688.27	0.91	686.78	0.42	686.32 0.29
z9b	0.624	4.6983	99.92	390	0.31	22572	0.193	0.062475	0.063	0.969379	0.125	0.112534	0.064	0.984	690.42	1.34	688.14	0.62	687.45 0.42
z10b	1.411	3.3493	99.77	159	0.65	7685	0.437	0.062653	0.071	0.983292	0.132	0.113825	0.064	0.972	696.47	1.51	695.29	0.66	694.93 0.42
74PL09																			
z1	1.306	21.9681	99.98	2138	0.31	105645	0.404	0.062779	0.040	0.990762	0.084	0.114460	0.048	0.964	700.75	0.86	699.11	0.43	698.60 0.32
FH-DZ1																			
z16	0.567	1.0472	99.08	33	0.81	1957	0.176	0.062612	0.195	0.987196	0.240	0.114351	0.076	0.689	695.09	4.16	697.29	1.21	697.97 0.50
z41	1.156	1.9124	97.74	15	3.65	808	0.358	0.062381	0.172	0.966575	0.230	0.112379	0.084	0.781	687.19	3.67	686.70	1.15	686.55 0.55
z43	0.892	3.4113	99.46	62	1.52	3389	0.276	0.062434	0.096	0.967494	0.152	0.112390	0.065	0.911	689.00	2.05	687.17	0.76	686.61 0.43
z76	0.643	0.8957	98.69	24	0.99	1379	0.199	0.062217	0.236	0.955397	0.284	0.111371	0.073	0.730	681.57	5.04	680.91	1.41	680.71 0.47
z81	0.885	5.6459	99.69	108	1.45	5876	0.274	0.062346	0.075	0.957693	0.135	0.111408	0.066	0.957	685.99	1.60	682.10	0.67	680.92 0.42
z96	0.805	1.1059	98.85	28	1.07	1571	0.249	0.062343	0.198	0.961147	0.246	0.111816	0.072	0.752	685.89	4.22	683.89	1.23	683.28 0.47
z98	0.673	0.8040	98.45	20	1.05	1163	0.208	0.062603	0.266	0.990342	0.324	0.114733	0.069	0.874	694.78	5.66	698.89	1.64	700.17 0.46

70PL09

z2	0.280	0.0411	92.44	3	0.28	239	0.087	0.061088	2.194	0.928228	2.348	0.110205	0.486	0.410	642.32	47.16	666.70	11.48	673.94	3.11
z3	0.279	0.0472	93.50	4	0.27	277	0.086	0.062399	1.875	0.978057	2.037	0.113680	0.445	0.459	687.83	40.00	692.61	10.23	694.08	2.93
z4	0.590	0.0946	96.07	8	0.32	459	0.183	0.062297	0.917	0.961729	1.025	0.111966	0.272	0.509	684.31	19.57	684.19	5.10	684.15	1.77
z5	0.755	0.0479	93.45	5	0.28	275	0.234	0.062935	1.712	1.004528	1.866	0.115763	0.460	0.444	706.03	36.42	706.11	9.49	706.13	3.08
z6	0.435	0.0804	94.89	6	0.36	353	0.135	0.062734	1.026	0.997737	1.140	0.115348	0.266	0.522	699.23	21.86	702.66	5.78	703.73	1.77
z7	0.465	0.2511	98.41	19	0.34	1134	0.144	0.062008	0.309	0.944093	0.365	0.110424	0.104	0.638	674.39	6.62	675.02	1.80	675.21	0.67
z8	0.516	1.4926	99.77	135	0.28	8016	0.160	0.062062	0.077	0.946030	0.137	0.110554	0.065	0.954	676.26	1.64	676.03	0.67	675.96	0.42
z9	0.500	0.0737	95.80	7	0.27	429	0.155	0.062809	0.967	0.998279	1.077	0.115273	0.287	0.495	701.78	20.59	702.94	5.46	703.30	1.91
z10	0.382	0.1696	97.61	12	0.34	756	0.118	0.062196	0.497	0.947672	0.569	0.110508	0.153	0.577	680.85	10.61	676.89	2.81	675.70	0.98
z11	0.409	0.3019	99.17	35	0.21	2181	0.127	0.062245	0.210	0.974534	0.267	0.113552	0.097	0.709	682.53	4.48	690.80	1.34	693.34	0.64
z12	0.404	0.7243	99.65	84	0.21	5137	0.125	0.062022	0.105	0.944430	0.162	0.110439	0.074	0.863	674.86	2.24	675.20	0.80	675.30	0.47
z13	1.184	0.2003	98.86	31	0.19	1586	0.366	0.062877	0.236	1.001754	0.301	0.115549	0.120	0.683	704.09	5.03	704.70	1.53	704.89	0.80
z14	0.865	0.2322	98.76	26	0.24	1456	0.268	0.062819	0.260	0.999755	0.320	0.115425	0.113	0.656	702.11	5.54	703.69	1.62	704.18	0.76

69PL09

z2	0.777	0.1016	93.98	5	0.54	300	0.240	0.062083	1.314	0.986161	1.434	0.115205	0.300	0.486	676.98	28.09	696.76	7.23	702.91	2.00

z3	0.719	0.0932	94.72	6	0.43	341	0.222	0.062241	1.139	0.987496	1.246	0.115069	0.280	0.477	682.40	24.32	697.44	6.28	702.12 1.86
z4	1.038	0.0182	87.38	2	0.22	143	0.321	0.051014	11.446	0.801085	11.657	0.113891	1.180	0.228	241.46	263.79	597.44	52.64	695.30 7.78
z5	0.843	0.1641	98.38	20	0.22	1117	0.261	0.062738	0.314	1.000259	0.382	0.115633	0.147	0.613	699.36	6.68	703.94	1.94	705.38 0.98
z6	0.790	0.0655	96.35	9	0.21	495	0.244	0.062568	0.961	0.995859	1.069	0.115437	0.319	0.470	693.57	20.49	701.71	5.42	704.25 2.13
z7	0.827	0.2551	98.76	26	0.27	1457	0.256	0.062622	0.276	0.997809	0.348	0.115564	0.154	0.640	695.41	5.88	702.70	1.76	704.98 1.03
z8	0.768	1.3898	96.64	9	4.05	527	0.238	0.063604	1.511	1.014863	1.607	0.115724	0.230	0.474	728.47	32.04	711.33	8.22	705.91 1.54
z9a	1.005	1.6599	99.83	200	0.24	10557	0.311	0.062840	0.081	1.000831	0.138	0.115511	0.067	0.925	702.82	1.71	704.23	0.70	704.68 0.45
z9b	1.040	0.5086	99.46	64	0.23	3348	0.322	0.062892	0.144	0.998587	0.196	0.115157	0.078	0.772	704.57	3.07	703.09	0.99	702.63 0.52
z10a	1.014	0.3341	99.08	37	0.26	1954	0.314	0.062717	0.210	0.999111	0.263	0.115539	0.092	0.695	698.64	4.47	703.36	1.33	704.84 0.61
z10b	0.994	0.3855	98.66	25	0.43	1346	0.308	0.062515	0.268	0.995519	0.316	0.115495	0.089	0.642	691.79	5.71	701.53	1.60	704.58 0.59
z11	0.646	0.1849	98.67	23	0.21	1358	0.200	0.062774	0.309	1.000319	0.369	0.115573	0.128	0.607	700.60	6.58	703.97	1.88	705.03 0.86
z12a	0.561	0.0572	95.97	7	0.20	447	0.174	0.062011	1.079	0.977679	1.205	0.114347	0.395	0.465	674.49	23.08	692.41	6.05	697.95 2.62
z12b	0.597	0.3221	98.87	27	0.31	1594	0.185	0.062515	0.193	0.983860	0.259	0.114142	0.086	0.828	691.79	4.13	695.58	1.30	696.76 0.57
z13	0.771	0.7600	99.59	79	0.26	4447	0.239	0.062766	0.115	0.999478	0.168	0.115490	0.073	0.829	700.32	2.45	703.54	0.85	704.55 0.49
z14	0.700	0.6542	99.60	79	0.22	4516	0.217	0.062866	0.107	1.001911	0.162	0.115587	0.073	0.853	703.71	2.28	704.78	0.83	705.11 0.49
z15a	0.824	2.4711	99.89	288	0.23	15892	0.255	0.062930	0.069	1.002169	0.129	0.115499	0.065	0.962	705.88	1.47	704.91	0.66	704.61 0.43

z15b	0.753	1.0824	99.70	107	0.27	5986	0.233	0.062918	0.100	1.000841	0.154	0.115368	0.069	0.873	705.47	2.13	704.24	0.78	703.85	0.46
z18a	0.875	0.1291	97.00	11	0.33	601	0.271	0.063237	0.572	1.010552	0.646	0.115901	0.183	0.521	716.21	12.15	709.15	3.30	706.93	1.22
z18b	0.834	0.1060	97.53	13	0.22	730	0.258	0.062869	0.543	1.005029	0.621	0.115942	0.202	0.524	703.81	11.57	706.36	3.16	707.16	1.36
z19	0.770	1.2916	99.77	142	0.24	7912	0.238	0.062947	0.085	1.002210	0.144	0.115473	0.073	0.900	706.45	1.80	704.93	0.73	704.45	0.49
z20	0.701	0.5979	99.52	66	0.24	3732	0.217	0.063650	0.120	1.024185	0.174	0.116702	0.075	0.819	730.03	2.55	716.01	0.89	711.55	0.51
z21	0.740	0.3910	99.23	41	0.25	2341	0.229	0.062934	0.190	1.003111	0.237	0.115601	0.087	0.674	706.00	4.04	705.39	1.21	705.20	0.58
z22	0.946	2.1410	99.91	358	0.17	19150	0.293	0.062977	0.065	1.002981	0.127	0.115508	0.064	0.978	707.45	1.39	705.32	0.64	704.65	0.43

(a) z1, z2 etc. are labels for single zircon grains or fragments annealed and chemically abraded after Mattinson (2005).

(b) Model Th/U ratio iteratively calculated from the radiogenic 208Pb/206Pb ratio and 206Pb/238U age.

(c) Pb* and Pbc represent radiogenic and common Pb, respectively; mol % 206Pb* with respect to radiogenic, blank and initial common Pb.

(d) Measured ratio corrected for spike and fractionation only. Fractionation estimated at 0.18 +/- 0.03 %/a.m.u. for Daly analyses, based on analysis of NBS-981 and NBS-982.

(e) Corrected for fractionation, spike, and common Pb; up to 1 pg of common Pb was assumed to be procedural blank: 206Pb/204Pb = 18.042 ± 0.61%; 207Pb/204Pb = 15.537 ± 0.52%; 208Pb/204Pb = 37.686 ± 0.63% (all uncertainties 1-sigma).

Excess over blank was assigned to initial common Pb, using the Stacey and Kramers (1975) two-stage Pb isotope evolution model at the nominal sample age.

(f) Errors are 2-sigma, propagated using the algorithms of Schmitz and Schoene (2007).

(g) Calculations are based on the decay constants of Jaffey et al. (1971). 206Pb/238U and 207Pb/206Pb ages corrected for initial disequilibrium in 230Th/238U using Th/U [magma] = 3.

APPENDIX 4A

BSU zircon LA-ICPMS U-Pb geochronology

Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{235}U$	±2s (%)	$^{206}Pb/^{238}U$	±2s (%)	error corr.	$^{238}U/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$ (Ma)	±2s (abs)	$^{207}Pb/^{235}U$ (Ma)	±2s (abs)	$^{206}Pb/^{238}U$ (Ma)	±2s (abs)	% disc.
		Composition					Corrected isotope ratios									Apparent ages (Ma)						
01DS-05																						
<10% discordant																						
01DS-05 L 619	1	203	50	23	0.25	1361	0.884	7.6	0.1032	6.5	0.85	9.6942	6.5	0.0622	4.0	680	85	643	36	633	39	7
01DS-05 L 622	1	78	7	9	0.09	982	1.015	9.3	0.1155	7.1	0.76	8.6562	7.1	0.0637	6.1	732	129	711	48	705	47	4
01DS-05 L 626	1	518	161	61	0.31	4713	0.777	9.3	0.0932	7.6	0.82	10.7306	7.6	0.0604	5.4	620	117	584	41	574	42	7
01DS-05 L 639	1	266	133	37	0.50	1924	0.984	8.5	0.1157	7.8	0.93	8.6406	7.8	0.0617	3.2	662	68	696	43	706	52	-7
01DS-05 L 644	1	370	106	44	0.29	1780	0.861	7.7	0.1020	5.8	0.76	9.8026	5.8	0.0612	5.1	646	109	630	36	626	35	3
01DS-05 L 657	1	105	19	12	0.18	716	0.941	10.0	0.1112	5.8	0.58	8.9912	5.8	0.0614	8.2	653	175	674	49	680	37	-4
01DS-05 L 698	1	988	628	116	0.64	1249	0.515	24.4	0.0666	5.3	0.22	15.0239	5.3	0.0561	23.8	457	528	422	84	415	21	9
>10% discordant																						
01DS-05 L 611	1	244	55	35	0.22	624	1.547	8.1	0.1097	5.1	0.63	9.1157	5.1	0.1023	6.3	1665	116	949	50	671	33	60
01DS-05 L 613	1	923	435	108	0.47	11534	0.624	6.5	0.0717	6.0	0.92	13.9420	6.0	0.0631	2.5	712	54	492	25	447	26	37
01DS-05 L 615	1	774	338	95	0.44	5591	0.691	7.5	0.0813	7.0	0.93	12.2976	7.0	0.0616	2.7	661	58	533	31	504	34	24
01DS-05 L 616	1	1152	609	141	0.53	30048	0.527	7.9	0.0627	7.6	0.96	15.9463	7.6	0.0610	2.3	638	49	430	28	392	29	39

01DS-05 L 618	1	268	117	36	0.44	2364	1.015	11.2	0.1092	9.4	0.84	9.1536	9.4	0.0674	6.1	850	126	712	57	668	60	21
01DS-05 L 620	1	768	309	91	0.40	18557	0.677	6.8	0.0794	6.2	0.92	12.5903	6.2	0.0618	2.7	668	58	525	28	493	30	26
01DS-05 L 623	1	100	69	7	0.69	254	0.552	9.7	0.0665	5.7	0.59	15.0382	5.7	0.0603	7.8	613	168	447	35	415	23	32
01DS-05 L 624	1	609	177	69	0.29	1929	0.917	10.0	0.0838	6.7	0.66	11.9358	6.7	0.0794	7.5	1181	148	661	49	519	33	56
01DS-05 L 625	1	472	142	53	0.30	7483	0.786	8.2	0.0901	6.7	0.82	11.1017	6.7	0.0633	4.7	717	100	589	37	556	36	22
01DS-05 L 627	1	412	123	43	0.30	3645	0.754	10.1	0.0862	8.5	0.84	11.6021	8.5	0.0635	5.5	724	117	571	44	533	43	26
01DS-05 L 628	1	220	54	25	0.25	5901	0.909	10.6	0.1041	7.8	0.74	9.6071	7.8	0.0634	7.1	721	151	657	51	638	48	11
01DS-05 L 629	1	431	143	54	0.33	6490	0.893	8.2	0.1008	6.3	0.76	9.9165	6.3	0.0642	5.4	749	113	648	39	619	37	17
01DS-05 L 630	1	461	42	51	0.09	236	1.199	13.9	0.0816	9.5	0.69	12.2474	9.5	0.1065	10.1	1740	185	800	77	506	46	71
01DS-05 L 631	1	238	67	33	0.28	392	1.501	13.4	0.1073	4.3	0.32	9.3230	4.3	0.1015	12.7	1652	235	931	82	657	27	60
01DS-05 L 632	1	299	49	33	0.16	628	0.909	8.6	0.0961	7.1	0.82	10.4055	7.1	0.0686	5.0	886	103	656	42	592	40	33
01DS-05 L 633	1	479	137	57	0.29	1777	0.819	6.6	0.0950	5.3	0.81	10.5271	5.3	0.0625	3.9	691	83	607	30	585	30	15
01DS-05 L 634	1	343	87	39	0.25	2322	0.849	9.0	0.0972	7.9	0.88	10.2915	7.9	0.0634	4.2	722	89	624	42	598	45	17
01DS-05 L 635	1	827	283	95	0.34	3077	0.676	7.1	0.0781	6.1	0.86	12.8068	6.1	0.0628	3.6	703	76	525	29	485	29	31
01DS-05 L 636	1	750	240	88	0.32	2758	0.722	8.1	0.0840	7.4	0.90	11.9073	7.4	0.0623	3.5	685	74	552	35	520	37	24
01DS-05 L 637	1	595	197	70	0.33	5276	0.827	9.4	0.0878	8.2	0.87	11.3850	8.2	0.0683	4.7	877	98	612	43	543	43	38

01DS-05 L 638	1	442	198	52	0.45	7095	0.874	7.4	0.0907	6.1	0.83	11.0257	6.1	0.0699	4.2	925	85	638	35	560	33	39
01DS-05 L 640	1	447	144	54	0.32	1419	0.859	5.9	0.0964	4.5	0.77	10.3708	4.5	0.0646	3.7	763	78	630	28	593	26	22
01DS-05 L 641	1	444	142	54	0.32	1805	0.878	7.5	0.0970	6.8	0.91	10.3140	6.8	0.0657	3.2	796	66	640	35	597	39	25
01DS-05 L 642	1	645	339	81	0.53	16792	0.739	5.8	0.0884	5.1	0.89	11.3147	5.1	0.0607	2.7	627	57	562	25	546	27	13
01DS-05 L 643	1	656	328	80	0.50	2500	0.755	6.9	0.0864	5.4	0.78	11.5768	5.4	0.0634	4.3	722	92	571	30	534	28	26
01DS-05 L 645	1	975	411	120	0.42	2959	0.650	8.3	0.0767	7.9	0.95	13.0297	7.9	0.0614	2.5	653	54	508	33	477	36	27
01DS-05 L 646	1	652	283	70	0.43	17336	0.710	7.1	0.0816	6.2	0.88	12.2620	6.2	0.0632	3.4	714	73	545	30	505	30	29
01DS-05 L 647	1	603	196	71	0.33	1976	0.783	7.5	0.0908	7.0	0.93	11.0172	7.0	0.0626	2.8	694	61	587	34	560	38	19
01DS-05 L 648	1	529	394	67	0.74	2452	0.761	6.4	0.0895	5.9	0.92	11.1766	5.9	0.0617	2.5	663	54	575	28	552	31	17
01DS-05 L 649	1	839	380	100	0.45	20583	0.682	9.0	0.0778	8.4	0.93	12.8498	8.4	0.0636	3.2	728	69	528	37	483	39	34
01DS-05 L 652	1	160	67	21	0.42	351	1.205	17.0	0.1050	5.7	0.34	9.5214	5.7	0.0832	16.0	1275	312	803	94	644	35	49
01DS-05 L 653	1	132	36	15	0.27	1104	1.009	8.1	0.1050	5.5	0.67	9.5208	5.5	0.0697	6.0	919	123	708	41	644	34	30
01DS-05 L 655	1	263	100	31	0.38	2520	0.894	6.8	0.1018	4.9	0.73	9.8191	4.9	0.0637	4.6	730	98	648	32	625	29	14
01DS-05 L 656	1	1014	624	126	0.62	52352	0.654	7.4	0.0734	6.8	0.92	13.6332	6.8	0.0646	2.9	763	61	511	30	456	30	40
01DS-05 L 658	1	186	63	21	0.34	822	0.854	6.5	0.0992	5.2	0.79	10.0771	5.2	0.0624	4.0	689	86	627	31	610	30	12
01DS-05 L 660	1	420	136	52	0.32	676	1.059	11.2	0.0974	3.8	0.34	10.2664	3.8	0.0789	10.6	1169	209	733	59	599	22	49

01DS-05 L 662	1	333	129	40	0.39	2259	0.879	5.4	0.0994	3.8	0.70	10.0571	3.8	0.0641	3.9	746	82	641	26	611	22	18
01DS-05 L 663	1	187	73	22	0.39	952	1.061	5.3	0.1002	3.9	0.73	9.9779	3.9	0.0768	3.6	1116	73	734	28	616	23	45
01DS-05 L 664	1	171	65	43	0.38	99	3.875	16.1	0.1336	9.6	0.59	7.4874	9.6	0.2104	13.0	2909	210	1609	130	808	73	72
01DS-05 L 665	1	601	231	70	0.38	8812	0.754	6.3	0.0875	5.7	0.90	11.4229	5.7	0.0625	2.8	690	60	571	28	541	29	22
01DS-05 L 666	1	604	163	65	0.27	3934	0.728	6.8	0.0819	6.2	0.92	12.2068	6.2	0.0644	2.7	755	57	555	29	508	30	33
01DS-05 L 667	1	919	289	100	0.31	11873	0.632	8.8	0.0703	8.5	0.96	14.2298	8.5	0.0652	2.4	780	51	497	35	438	36	44
01DS-05 L 668	1	803	467	94	0.58	4959	0.651	6.2	0.0736	5.6	0.90	13.5844	5.6	0.0641	2.7	746	57	509	25	458	25	39
01DS-05 L 669	1	433	113	45	0.26	4557	0.759	5.8	0.0864	4.6	0.79	11.5802	4.6	0.0637	3.5	732	75	573	25	534	23	27
01DS-05 L 670	1	253	51	27	0.20	4933	0.882	6.1	0.0976	5.2	0.85	10.2448	5.2	0.0655	3.2	790	67	642	29	600	30	24
01DS-05 L 671	1	527	142	56	0.27	6032	0.723	7.8	0.0835	6.6	0.84	11.9795	6.6	0.0628	4.2	702	89	552	33	517	33	26
01DS-05 L 672	1	888	339	105	0.38	6185	0.716	10.4	0.0730	8.6	0.83	13.6914	8.6	0.0711	5.8	961	119	549	44	454	38	53
01DS-05 L 673	1	477	144	53	0.30	700	0.818	7.4	0.0878	6.1	0.83	11.3846	6.1	0.0676	4.1	855	86	607	34	543	32	37
01DS-05 L 674	1	696	314	80	0.45	2495	0.697	8.2	0.0798	7.9	0.96	12.5306	7.9	0.0633	2.2	718	46	537	34	495	38	31
01DS-05 L 675	1	760	215	86	0.28	5652	0.708	7.3	0.0805	5.9	0.81	12.4165	5.9	0.0638	4.3	735	91	544	31	499	28	32
01DS-05 L 676	1	881	387	105	0.44	11449	0.668	10.3	0.0763	9.1	0.89	13.1052	9.1	0.0635	4.8	725	101	519	42	474	42	35
01DS-05 L 677	1	1057	465	117	0.44	2084	0.599	10.9	0.0645	9.4	0.87	15.4941	9.4	0.0674	5.5	849	114	477	42	403	37	53

01DS-05 L 678	1	1009	388	125	0.38	6245	0.656	9.9	0.0747	8.3	0.84	13.3914	8.3	0.0637	5.4	731	113	512	40	464	37 37
01DS-05 L 679	1	417	86	45	0.21	2885	0.826	9.2	0.0910	7.9	0.86	10.9878	7.9	0.0658	4.7	800	99	611	42	562	42 30
01DS-05 L 680	1	397	89	44	0.23	1997	0.843	9.8	0.0940	9.2	0.94	10.6426	9.2	0.0650	3.3	776	68	621	45	579	51 25
01DS-05 L 681	1	131	28	14	0.21	2173	0.930	8.7	0.1002	7.0	0.81	9.9788	7.0	0.0673	5.1	847	106	668	42	616	41 27
01DS-05 L 682	1	742	245	82	0.33	1167	0.699	8.1	0.0795	6.8	0.84	12.5805	6.8	0.0638	4.4	734	94	538	34	493	32 33
01DS-05 L 683	1	756	311	83	0.41	12112	0.682	7.7	0.0755	6.3	0.82	13.2538	6.3	0.0655	4.4	791	93	528	32	469	29 41
01DS-05 L 684	1	38	6	5	0.16	1405	1.168	12.1	0.1228	7.8	0.65	8.1424	7.8	0.0690	9.2	897	189	786	66	747	55 17
01DS-05 L 685	1	448	136	48	0.30	1005	0.805	8.4	0.0865	6.2	0.74	11.5567	6.2	0.0675	5.6	852	117	600	38	535	32 37
01DS-05 L 686	1	892	377	103	0.42	4236	0.656	6.8	0.0738	6.2	0.91	13.5426	6.2	0.0644	2.8	755	59	512	27	459	27 39
01DS-05 L 687	1	819	358	96	0.44	4493	0.688	8.1	0.0771	7.2	0.88	12.9646	7.2	0.0647	3.8	766	80	532	34	479	33 37
01DS-05 L 688	1	51	14	6	0.28	223	1.074	7.7	0.1117	4.2	0.55	8.9493	4.2	0.0697	6.4	919	132	740	40	683	27 26
01DS-05 L 689	1	461	158	51	0.34	2211	0.793	9.4	0.0891	8.3	0.88	11.2270	8.3	0.0646	4.4	762	93	593	42	550	44 28
01DS-05 L 690	1	868	480	98	0.55	7297	0.675	8.9	0.0728	7.8	0.88	13.7445	7.8	0.0673	4.2	848	88	524	36	453	34 47
01DS-05 L 691	1	1008	417	118	0.41	87322	0.645	7.8	0.0730	7.1	0.91	13.6976	7.1	0.0640	3.2	743	67	505	31	454	31 39
01DS-05 L 692	1	891	367	101	0.41	1216	0.652	11.7	0.0747	11.3	0.97	13.3952	11.3	0.0633	2.9	718	62	509	47	464	51 35
01DS-05 L 693	1	873	360	100	0.41	5082	0.632	8.1	0.0732	7.5	0.92	13.6563	7.5	0.0626	3.1	696	67	498	32	456	33 35

01DS-05 L 694	1	432	132	47	0.30	2220	0.796	6.4	0.0899	5.3	0.83	11.1215	5.3	0.0642	3.6	748	75	594	29	555	28	26
01DS-05 L 695	1	570	247	67	0.43	5657	0.754	7.3	0.0878	6.6	0.91	11.3850	6.6	0.0623	3.0	684	65	571	32	543	35	21
01DS-05 L 696	1	366	92	40	0.25	3143	0.840	8.4	0.0942	7.1	0.84	10.6170	7.1	0.0647	4.5	764	95	619	39	580	39	24
01DS-05 L 697	1	874	467	102	0.53	11891	0.658	9.3	0.0729	9.0	0.97	13.7114	9.0	0.0654	2.4	788	51	513	37	454	39	42
01DS-05 L 699	1	629	228	81	0.36	1761	0.879	11.6	0.0904	11.2	0.97	11.0575	11.2	0.0705	3.0	942	62	640	55	558	60	41
01DS-05 L 700	1	518	177	65	0.34	3718	0.836	15.6	0.0978	15.1	0.97	10.2296	15.1	0.0620	3.7	674	79	617	72	601	87	11
01DS-05 L 701	1	125	33	23	0.26	235	2.307	22.2	0.1313	9.1	0.41	7.6142	9.1	0.1274	20.3	2062	357	1214	157	795	68	61
01DS-05 L 702	1	817	460	103	0.56	9843	0.680	9.2	0.0788	8.1	0.89	12.6824	8.1	0.0626	4.3	693	91	527	38	489	38	29
01DS-05 L 703	1	558	199	62	0.36	11390	0.781	7.6	0.0862	6.8	0.90	11.5988	6.8	0.0657	3.3	798	69	586	34	533	35	33
01DS-05 L 704	1	97	29	17	0.30	88	2.563	9.3	0.1221	6.8	0.73	8.1881	6.8	0.1522	6.4	2371	109	1290	68	743	48	69
01DS-05 L 706	1	575	307	67	0.53	1375	0.795	7.6	0.0883	7.1	0.93	11.3257	7.1	0.0653	2.8	783	58	594	34	545	37	30
01DS-05 L 707	1	1263	523	106	0.41	4095	0.484	21.0	0.0553	20.9	0.99	18.0796	20.9	0.0635	2.6	725	56	401	70	347	70	52
01DS-05 L 708	1	492	159	55	0.32	5355	0.818	6.8	0.0872	4.9	0.73	11.4614	4.9	0.0680	4.7	869	97	607	31	539	26	38
01DS-05 L 709	1	609	270	70	0.44	8395	0.767	5.6	0.0858	5.1	0.91	11.6618	5.1	0.0649	2.4	770	50	578	25	530	26	31
01DS-05 L 710	2	673	250	77	0.37	1545	0.714	7.3	0.0790	6.4	0.87	12.6558	6.4	0.0655	3.6	791	75	547	31	490	30	38
01DS-05 L 711	2	716	274	80	0.38	51046	0.653	6.6	0.0769	5.4	0.81	13.0031	5.4	0.0616	3.9	660	83	510	27	478	25	28

01DS-05 L 712	2	927	664	115	0.72	5638	0.585	6.8	0.0661	6.5	0.95	15.1328	6.5	0.0642	2.2	750	46	468	26	413	26	45
01DS-05 L 713	2	494	166	52	0.34	1894	0.765	6.6	0.0828	5.1	0.78	12.0838	5.1	0.0670	4.1	838	86	577	29	513	25	39
01DS-05 L 714	2	542	205	64	0.38	8224	0.772	6.6	0.0888	6.0	0.92	11.2584	6.0	0.0630	2.6	708	56	581	29	549	32	23
01DS-05 L 715	2	1144	728	139	0.64	13600	0.496	10.2	0.0558	9.7	0.96	17.9182	9.7	0.0644	2.9	755	61	409	34	350	33	54
01DS-05 L 716	2	1193	510	135	0.43	8979	0.475	10.2	0.0533	9.9	0.97	18.7497	9.9	0.0647	2.6	763	56	395	33	335	32	56

Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	^{206}Pb/^{204}Pb	^{207}Pb/^{235}U	±2s (%)	^{206}Pb/^{238}U	±2s (%)	error corr.	^{238}U/^{206}Pb	±2s (%)	^{207}Pb/^{206}Pb	±2s (%)	^{207}Pb/^{206}Pb	±2s (abs)	^{207}Pb/^{235}U	±2s (abs)	^{206}Pb/^{238}U	±2s (abs)	% disc.
2KE085A																						
<10% discordant																						
2KE085A L 149	1	254	298	38	1.17	1661	0.913	4.6	0.1065	3.9	0.84	9.3895	3.9	0.0622	2.4	681	52	659	22	652	24	4
2KE085A L 150	1	374	503	57	1.35	898	0.884	5.0	0.1057	4.1	0.82	9.4642	4.1	0.0606	2.9	627	62	643	24	648	25	-3
2KE085A L 151	1	542	697	81	1.29	82475	0.867	4.3	0.1035	3.9	0.91	9.6597	3.9	0.0608	1.7	631	36	634	20	635	24	-1
2KE085A L 152	1	388	470	58	1.21	1310	0.899	4.3	0.1062	3.1	0.70	9.4163	3.1	0.0614	3.0	654	65	651	21	651	19	0
2KE085A L 153	1	443	576	66	1.30	2639	0.886	5.0	0.1037	4.3	0.86	9.6399	4.3	0.0619	2.5	672	54	644	24	636	26	5
2KE085A L 154	1	139	120	19	0.86	480	0.921	6.1	0.1087	5.0	0.81	9.2035	5.0	0.0615	3.5	657	75	663	30	665	32	-1
2KE085A L 156	1	219	233	32	1.07	6547	0.894	5.9	0.1035	5.3	0.89	9.6585	5.3	0.0626	2.7	695	57	648	28	635	32	9

2KE085A L 157	1	425	557	64	1.31	5880	0.866	4.5	0.1017	4.2	0.92	9.8283	4.2	0.0617	1.7	664	36	633	21	625	25	6
2KE085A L 158	1	116	97	16	0.83	815	0.911	6.5	0.1050	4.8	0.74	9.5279	4.8	0.0630	4.4	707	93	658	31	643	29	9
2KE085A L 160	1	631	855	98	1.36	16992	0.850	4.2	0.1004	3.4	0.81	9.9627	3.4	0.0614	2.4	655	52	625	20	617	20	6
2KE085A L 162	1	409	563	64	1.37	3382	0.853	5.7	0.0999	4.8	0.84	10.0084	4.8	0.0619	3.1	671	66	626	27	614	28	9
2KE085A L 164	1	499	534	76	1.07	944	0.857	5.1	0.1036	4.5	0.86	9.6527	4.5	0.0600	2.6	603	55	628	24	635	27	-5
2KE085A L 165	1	434	467	67	1.07	1257	0.864	4.9	0.1034	4.4	0.89	9.6697	4.4	0.0606	2.2	625	47	632	23	634	27	-2
2KE085A L 167	1	467	432	71	0.93	25092	0.895	4.1	0.1057	3.2	0.78	9.4634	3.2	0.0614	2.5	653	54	649	19	648	20	1
2KE085A L 168	1	256	205	38	0.80	514	0.931	5.3	0.1082	3.6	0.68	9.2412	3.6	0.0624	3.8	688	82	668	26	662	23	4
2KE085A L 169	1	779	724	119	0.93	2305	0.864	4.3	0.1035	3.6	0.84	9.6630	3.6	0.0605	2.3	623	49	632	20	635	22	-2
2KE085A L 170	1	872	759	134	0.87	3632	0.872	3.2	0.1053	2.4	0.75	9.5004	2.4	0.0601	2.1	606	45	636	15	645	15	-7
2KE085A L 172	1	551	1002	92	1.82	2313	0.873	4.3	0.1035	3.5	0.81	9.6607	3.5	0.0612	2.4	645	52	637	20	635	21	2
2KE085A L 173	1	324	411	48	1.27	1362	0.885	3.9	0.1040	3.3	0.84	9.6159	3.3	0.0617	2.1	664	44	644	19	638	20	4
2KE085A L 174	1	214	259	32	1.21	571	0.914	5.6	0.1067	3.9	0.68	9.3707	3.9	0.0621	4.1	679	87	659	27	654	24	4
2KE085A L 175	1	517	902	84	1.75	6408	0.897	4.6	0.1044	4.0	0.88	9.5820	4.0	0.0623	2.1	686	46	650	22	640	24	7
2KE085A L 176	1	662	1271	110	1.92	2742	0.859	6.0	0.1006	5.8	0.96	9.9417	5.8	0.0619	1.6	671	34	629	28	618	34	8
2KE085A L 177	1	692	1035	108	1.50	1530	0.848	5.7	0.1003	5.4	0.93	9.9679	5.4	0.0613	2.0	650	43	624	27	616	31	5

2KE085A L 178	1	388	457	56	1.18	3527	0.832	5.5	0.1011	4.9	0.87	9.8887	4.9	0.0596	2.7	590	58	614	26	621	29 -5
2KE085A L 179	1	544	539	79	0.99	3332	0.839	5.2	0.1026	4.5	0.87	9.7471	4.5	0.0593	2.5	578	55	618	24	630	27 -9
2KE085A L 180	1	276	272	39	0.98	1765	0.870	5.2	0.1048	4.0	0.77	9.5428	4.0	0.0602	3.3	612	71	636	25	642	25 -5
2KE085A L 181	1	429	381	59	0.89	17804	0.867	4.5	0.1008	4.2	0.91	9.9250	4.2	0.0624	1.8	687	38	634	21	619	25 10
2KE085A L 182	1	592	731	89	1.24	10582	0.835	4.5	0.0999	3.9	0.86	10.0067	3.9	0.0606	2.3	625	49	616	21	614	23 2
2KE085A L 183	1	229	180	32	0.79	4645	0.884	5.1	0.1040	4.5	0.88	9.6146	4.5	0.0616	2.3	661	50	643	24	638	28 4
2KE085A L 184	1	470	514	72	1.09	1099	0.882	5.3	0.1041	4.6	0.86	9.6058	4.6	0.0615	2.7	655	57	642	25	638	28 3
2KE085A L 185	1	494	541	75	1.10	1654	0.870	4.6	0.1032	4.3	0.92	9.6902	4.3	0.0611	1.7	643	37	635	22	633	26 2
2KE085A L 186	1	308	298	46	0.97	1356	0.882	5.2	0.1054	4.1	0.78	9.4839	4.1	0.0607	3.3	628	70	642	25	646	25 -3
2KE085A L 187	1	457	435	66	0.95	5313	0.867	5.3	0.1016	4.7	0.88	9.8416	4.7	0.0619	2.5	670	53	634	25	624	28 7
2KE085A L 188	1	240	210	34	0.87	3719	0.900	5.0	0.1055	4.0	0.80	9.4801	4.0	0.0619	3.0	669	64	652	24	646	25 3
2KE085A L 189	1	483	557	75	1.15	1925	0.860	5.0	0.1013	4.0	0.79	9.8699	4.0	0.0616	3.0	660	65	630	24	622	24 6
2KE085A L 190	1	404	440	62	1.09	7703	0.857	5.3	0.1035	4.1	0.78	9.6605	4.1	0.0600	3.3	604	71	628	25	635	25 -5
2KE085A L 191	1	280	240	41	0.86	1785	0.907	5.7	0.1053	4.6	0.80	9.4944	4.6	0.0625	3.4	691	72	656	28	646	28 7
2KE085A L 192	1	374	361	56	0.96	2338	0.869	4.3	0.1029	3.4	0.79	9.7160	3.4	0.0612	2.6	647	57	635	20	632	21 2
2KE085A L 194	1	265	206	38	0.77	1251	0.895	5.1	0.1071	4.4	0.85	9.3401	4.4	0.0606	2.6	626	56	649	24	656	27 -5

2KE085A L 195	1	466	424	71	0.91	813	0.882	4.4	0.1052	3.7	0.84	9.5034	3.7	0.0608	2.3	631	50	642	21	645	23	-2
2KE085A L 196	1	228	174	32	0.76	1846	0.862	5.2	0.1038	4.6	0.87	9.6348	4.6	0.0602	2.5	612	54	631	25	637	28	-4
2KE085A L 197	1	423	380	63	0.90	2251	0.850	4.3	0.1029	3.5	0.82	9.7210	3.5	0.0599	2.4	600	52	624	20	631	21	-5
2KE085A L 198	1	371	380	59	1.03	719	0.931	4.3	0.1079	3.3	0.76	9.2671	3.3	0.0626	2.8	695	59	668	21	661	21	5
2KE085A L 199	1	492	438	74	0.89	920	0.880	3.9	0.1050	3.2	0.83	9.5211	3.2	0.0608	2.1	631	46	641	18	644	20	-2
2KE085A L 200	1	354	265	52	0.75	1107	0.909	4.7	0.1083	4.1	0.86	9.2360	4.1	0.0609	2.4	635	51	656	23	663	26	-4
2KE085A L 202	1	461	475	71	1.03	1214	0.876	4.6	0.1017	4.2	0.92	9.8287	4.2	0.0624	1.8	689	38	639	22	625	25	9
2KE085A L 204	1	195	124	26	0.64	1208	0.880	5.7	0.1028	5.3	0.92	9.7321	5.3	0.0621	2.2	677	47	641	27	631	32	7
2KE085A L 205	1	685	864	111	1.26	2365	0.864	5.3	0.1019	5.0	0.94	9.8093	5.0	0.0615	1.8	655	38	632	25	626	30	4
2KE085A L 206	1	864	1359	148	1.57	4826	0.817	5.8	0.0982	5.4	0.93	10.1839	5.4	0.0603	2.0	616	44	606	26	604	31	2
>10% discordant																						
2KE085A L 155	1	451	637	70	1.41	594	0.893	6.3	0.1029	5.5	0.88	9.7192	5.5	0.0630	3.0	707	63	648	30	631	33	11
2KE085A L 159	1	460	560	68	1.22	1616	0.856	4.3	0.0993	3.2	0.74	10.0739	3.2	0.0626	2.8	694	60	628	20	610	19	12
2KE085A L 161	1	410	479	62	1.17	1989	0.891	4.7	0.1020	4.1	0.88	9.8019	4.1	0.0633	2.2	719	47	647	22	626	25	13
2KE085A L 163	1	373	362	54	0.97	1948	0.889	5.2	0.1022	4.7	0.89	9.7816	4.7	0.0631	2.3	710	48	646	25	627	28	12
2KE085A L 166	1	314	251	46	0.80	1016	0.936	4.5	0.1063	3.5	0.78	9.4073	3.5	0.0639	2.8	738	58	671	22	651	22	12

2KE085A L 171	1	145	97	21	0.67	1040	0.983	5.6	0.1099	3.1	0.54	9.0965	3.1	0.0648	4.7	769	98	695	28	672	20	13
2KE085A L 193	1	146	97	20	0.67	646	0.926	5.3	0.1050	4.3	0.81	9.5253	4.3	0.0639	3.1	740	65	665	26	644	27	13
2KE085A L 201	1	269	189	39	0.70	3643	0.902	5.3	0.1096	4.2	0.79	9.1204	4.2	0.0597	3.2	592	70	653	25	671	27	-13
2KE085A L 203	1	294	251	43	0.85	784	0.984	6.2	0.1029	4.9	0.79	9.7189	4.9	0.0693	3.7	909	77	696	31	631	30	31

Analysis	notes	U ppm	Th ppm	Pb ppm	^{206}Pb Th/U	^{207}Pb/^{204}Pb	±2s ^{235}U	^{206}Pb (%)	±2s ^{238}U	error (%)	^{238}U corr.	±2s ^{206}Pb	^{207}Pb (%)	±2s ^{206}Pb	^{207}Pb (%)	±2s ^{206}Pb	^{207}Pb (abs)	±2s ^{235}U	^{206}Pb (abs)	±2s ^{238}U	% (abs)	disc.
3KE043																						
<10% discordant																						
3KE043 L 207	1	152	156	22	1.02	6650	0.905	5.8	0.1058	4.4	0.75	9.4475	4.4	0.0620	3.8	675	80	654	28	649	27	4
3KE043 L 209	1	78	43	10	0.55	276	0.872	6.9	0.1036	5.2	0.74	9.6516	5.2	0.0611	4.6	641	99	637	33	636	31	1
3KE043 L 211	1	139	104	20	0.75	1134	0.947	6.3	0.1125	5.2	0.83	8.8877	5.2	0.0610	3.5	640	75	676	31	687	34	-7
3KE043 L 213	1	69	49	9	0.71	154	0.841	9.5	0.1018	7.1	0.75	9.8240	7.1	0.0599	6.3	601	136	620	44	625	42	-4
3KE043 L 215	1	47	23	6	0.50	98	0.894	7.6	0.1039	4.3	0.56	9.6220	4.3	0.0624	6.3	688	134	649	37	637	26	7
3KE043 L 216	1	37	28	5	0.76	118	0.941	8.8	0.1091	4.7	0.53	9.1653	4.7	0.0626	7.4	694	158	674	43	668	30	4
3KE043 L 217	1	27	16	3	0.59	126	0.909	8.1	0.1048	5.2	0.64	9.5428	5.2	0.0629	6.2	706	132	657	39	642	32	9
3KE043 L 220	1	129	71	17	0.56	454	0.904	5.9	0.1055	4.1	0.69	9.4831	4.1	0.0622	4.3	680	92	654	29	646	25	5

3KE043 L 221	1	78	52	11	0.67	708	0.919	8.0	0.1090	5.6	0.70	9.1737	5.6	0.0611	5.7	643	122	662	39	667	36	-4
3KE043 L 224	1	37	24	5	0.65	566	0.860	10.5	0.1016	5.2	0.49	9.8427	5.2	0.0614	9.1	654	195	630	49	624	31	5
3KE043 L 225	1	44	18	6	0.41	293	0.912	8.0	0.1080	5.8	0.72	9.2587	5.8	0.0612	5.6	0	#DIV/0!	658	39	661	36	0
3KE043 L 226	1	80	50	11	0.63	367	0.892	7.8	0.1060	5.2	0.66	9.4356	5.2	0.0610	5.8	640	125	647	37	649	32	-1
3KE043 L 231	1	8	4	1	0.47	27	0.879	21.8	0.1059	7.8	0.36	9.4448	7.8	0.0602	20.4	610	440	640	104	649	48	-6
3KE043 L 233	1	47	17	6	0.37	279	0.901	9.0	0.1051	3.7	0.41	9.5129	3.7	0.0622	8.2	680	175	652	43	644	23	5
3KE043 L 235	1	126	145	18	1.14	293	0.870	7.1	0.1014	4.3	0.60	9.8598	4.3	0.0622	5.7	681	121	636	33	623	25	9
3KE043 L 238	1	156	117	20	0.75	824	0.815	7.2	0.0994	5.8	0.80	10.0652	5.8	0.0595	4.3	586	93	605	33	611	34	-4
3KE043 L 241	1	120	54	16	0.45	1003	0.876	6.1	0.1050	5.1	0.82	9.5279	5.1	0.0606	3.5	624	75	639	29	643	31	-3
3KE043 L 243	1	59	22	7	0.38	551	0.881	7.4	0.1049	4.6	0.61	9.5339	4.6	0.0609	5.8	636	126	641	35	643	28	-1
3KE043 L 244	1	83	53	11	0.63	619	0.920	6.2	0.1072	4.5	0.72	9.3290	4.5	0.0622	4.3	683	92	662	30	656	28	4
3KE043 L 245	1	73	41	10	0.56	785	0.910	7.6	0.1078	4.4	0.58	9.2772	4.4	0.0613	6.1	648	132	657	37	660	28	-2
3KE043 L 246	1	66	39	9	0.58	487	0.906	8.7	0.1052	4.8	0.55	9.5043	4.8	0.0624	7.3	689	155	655	42	645	30	6
3KE043 L 247	1	30	14	4	0.49	84	0.899	10.7	0.1079	5.1	0.47	9.2663	5.1	0.0604	9.4	619	204	651	51	661	32	-7
3KE043 L 248	1	92	52	13	0.57	1653	0.940	5.8	0.1120	4.2	0.72	8.9295	4.2	0.0609	4.0	635	87	673	29	684	27	-8
3KE043 L 250	1	50	26	6	0.52	314	0.842	8.9	0.0992	5.3	0.60	10.0762	5.3	0.0616	7.1	659	151	620	41	610	31	7

3KE043 L 252	1	57	29	7	0.51	199	0.874	8.8	0.1037	5.8	0.65	9.6467	5.8	0.0612	6.7	645	144	638	42	636	35	1
3KE043 L 253	1	173	74	22	0.42	420	0.901	7.8	0.1063	6.8	0.88	9.4030	6.8	0.0614	3.7	654	79	652	37	652	42	0
3KE043 L 254	1	61	23	8	0.39	778	0.859	7.9	0.1041	4.7	0.59	9.6033	4.7	0.0598	6.4	598	138	630	37	639	29	-7
3KE043 L 257	1	116	81	16	0.69	606	0.855	9.9	0.1003	4.9	0.49	9.9737	4.9	0.0618	8.6	668	184	627	46	616	29	8
3KE044 L 259	1	311	530	50	1.70	2579	0.869	4.0	0.1044	2.3	0.58	9.5825	2.3	0.0604	3.2	618	69	635	19	640	14	-4
3KE044 L 260	1	282	253	38	0.90	1137	0.842	5.3	0.0992	3.9	0.73	10.0768	3.9	0.0615	3.6	658	77	620	25	610	23	7

>10% discordant

3KE043 L 208	1	105	102	14	0.97	465	0.883	6.4	0.0991	5.0	0.77	10.0865	5.0	0.0646	4.1	760	86	642	31	609	29	20
3KE043 L 210	1	23	11	3	0.49	208	0.835	10.1	0.1070	4.8	0.47	9.3497	4.8	0.0566	9.0	477	198	616	47	655	30	-37
3KE043 L 212	1	148	108	19	0.73	187	0.839	5.1	0.1032	3.5	0.68	9.6861	3.5	0.0590	3.7	566	82	619	24	633	21	-12
3KE043 L 214	1	186	179	25	0.96	1571	0.832	5.8	0.1038	4.7	0.80	9.6318	4.7	0.0582	3.5	536	76	615	27	637	28	-19
3KE043 L 218	1	92	66	12	0.72	438	0.865	7.6	0.0996	5.0	0.65	10.0383	5.0	0.0630	5.7	708	122	633	36	612	29	14
3KE043 L 219	1	38	25	5	0.67	460	0.918	10.4	0.1048	4.8	0.46	9.5457	4.8	0.0635	9.2	726	196	661	50	642	29	12
3KE043 L 222	1	9	3	1	0.33	39	0.748	20.6	0.1038	9.5	0.46	9.6295	9.5	0.0522	18.3	295	417	567	90	637	58	-116
3KE043 L 223	1	143	91	19	0.63	248	0.907	6.4	0.1038	4.6	0.71	9.6337	4.6	0.0634	4.5	722	95	656	31	637	28	12
3KE043 L 227	1	71	57	10	0.80	367	0.884	8.3	0.1081	4.3	0.51	9.2528	4.3	0.0593	7.1	580	155	643	40	662	27	-14

3KE043 L 228	1	36	18	6	0.49	115	1.523	21.5	0.1173	7.9	0.36	8.5223	7.9	0.0941	20.0	1511	378	940	132	715	53	53
3KE043 L 229	1	106	69	14	0.65	1191	0.894	6.7	0.1090	4.7	0.71	9.1738	4.7	0.0595	4.7	586	102	649	32	667	30	-14
3KE043 L 230	1	88	47	12	0.53	949	0.884	6.4	0.1096	3.9	0.60	9.1209	3.9	0.0584	5.1	547	112	643	31	671	25	-23
3KE043 L 232	1	111	101	15	0.91	142	0.866	6.4	0.1067	4.9	0.76	9.3734	4.9	0.0589	4.1	563	90	634	30	653	31	-16
3KE043 L 234	1	32	13	4	0.40	123	1.382	8.6	0.1068	6.5	0.76	9.3613	6.5	0.0938	5.6	1504	106	881	51	654	41	57
3KE043 L 236	1	138	83	18	0.60	1418	0.879	8.0	0.1076	5.9	0.74	9.2947	5.9	0.0592	5.4	576	117	640	38	659	37	-14
3KE043 L 237	1	18	7	2	0.38	39	0.927	11.9	0.1003	5.8	0.49	9.9701	5.8	0.0670	10.3	839	215	666	58	616	34	27
3KE043 L 239	1	22	11	3	0.50	507	0.953	9.8	0.1144	4.4	0.44	8.7425	4.4	0.0605	8.8	620	190	680	49	698	29	-13
3KE043 L 240	1	40	16	5	0.39	213	0.811	9.1	0.1036	4.3	0.47	9.6539	4.3	0.0568	8.0	483	177	603	41	635	26	-32
3KE043 L 242	1	8	2	1	0.29	353	0.858	16.1	0.1114	5.6	0.34	8.9784	5.6	0.0559	15.1	448	335	629	75	681	36	-52
3KE043 L 249	1	20	7	3	0.36	54	0.971	12.1	0.1067	6.0	0.49	9.3716	6.0	0.0660	10.5	807	221	689	61	654	37	19
3KE043 L 251	1	63	42	9	0.67	10597	0.862	7.9	0.1087	4.4	0.56	9.1984	4.4	0.0575	6.6	510	144	631	37	665	28	-30
3KE043 L 255	1	17	8	2	0.47	82	0.967	11.5	0.1073	5.7	0.50	9.3209	5.7	0.0654	10.0	787	210	687	57	657	36	17
3KE043 L 256	1	39	29	6	0.75	46	0.849	8.0	0.1055	4.9	0.61	9.4753	4.9	0.0584	6.3	544	139	624	37	647	30	-19
3KE043 L 258	1	14	5	2	0.38	121	0.956	14.9	0.1020	7.7	0.51	9.8020	7.7	0.0679	12.8	867	265	681	74	626	46	28

U Th Pb ^{206}Pb ^{207}Pb ±2s ^{206}Pb ±2s error ^{238}U ±2s ^{207}Pb ±2s ^{207}Pb ±2s ^{207}Pb ±2s ^{206}Pb ±2s %

Analysis	notes	ppm	ppm	ppm	Th/U	^{204}Pb	^{235}U	(%)	^{238}U	(%)	corr.	^{206}Pb	(%)	^{206}Pb	(%)	^{206}Pb	(abs)	^{235}U	(abs)	^{238}U	(abs)	disc.
3KE044																						
<10% discordant																						
3KE044 L 261	1	114	730	35	6.37	807	0.888	6.4	0.1050	4.6	0.70	9.5236	4.6	0.0614	4.4	652	95	645	31	644	28	1
3KE044 L 263	1	92	102	14	1.11	1843	0.959	7.9	0.1108	4.2	0.51	9.0224	4.2	0.0627	6.8	699	144	683	39	678	27	3
3KE044 L 264	1	143	175	22	1.22	708	0.955	5.1	0.1119	3.9	0.74	8.9342	3.9	0.0619	3.2	669	69	681	25	684	25	-2
3KE044 L 265	1	517	931	87	1.80	2118	0.909	3.9	0.1060	3.3	0.79	9.4375	3.3	0.0622	2.1	682	46	657	19	649	20	5
3KE044 L 266	1	223	340	36	1.53	609	0.946	4.4	0.1097	3.2	0.69	9.1198	3.2	0.0626	3.0	693	63	676	22	671	20	3
3KE044 L 267	1	418	691	71	1.65	2670	0.938	4.5	0.1110	3.9	0.83	9.0097	3.9	0.0613	2.3	651	49	672	22	679	25	-4
3KE044 L 268	1	93	106	14	1.13	1109	0.953	7.5	0.1101	5.3	0.69	9.0791	5.3	0.0628	5.3	700	113	680	37	674	34	4
3KE044 L 269	1	110	129	16	1.17	180	0.923	5.9	0.1085	4.2	0.68	9.2159	4.2	0.0617	4.2	664	91	664	29	664	26	0
3KE044 L 270	1	260	329	39	1.26	6074	0.897	5.0	0.1053	4.4	0.86	9.4993	4.4	0.0618	2.3	667	50	650	24	645	27	3
3KE044 L 271	1	253	383	40	1.51	14775	0.892	5.7	0.1067	5.0	0.85	9.3702	5.0	0.0606	2.8	626	60	648	27	654	31	-4
3KE044 L 273	1	318	546	53	1.72	767	0.882	5.5	0.1037	4.5	0.80	9.6432	4.5	0.0617	3.1	663	66	642	26	636	27	4
3KE044 L 277	1	191	264	30	1.38	528	0.874	5.4	0.1034	4.1	0.73	9.6689	4.1	0.0613	3.5	650	75	638	25	634	25	2
3KE044 L 281	1	214	264	34	1.23	458	0.901	5.4	0.1066	4.5	0.80	9.3847	4.5	0.0613	3.0	650	65	652	26	653	28	0

3KE044 L 284	1	243	304	38	1.25	968	0.890	6.8	0.1045	5.3	0.77	9.5665	5.3	0.0617	4.1	665	89	646	32	641	33	4
3KE044 L 286	1	15	28	3	1.81	57	0.838	18.3	0.1020	5.1	0.27	9.8045	5.1	0.0596	17.6	589	382	618	85	626	30	-6
3KE044 L 287	1	215	266	33	1.24	1063	0.945	4.9	0.1103	3.9	0.77	9.0633	3.9	0.0621	2.9	677	62	675	24	675	25	0
3KE044 L 288	1	366	306	52	0.83	8370	0.915	6.0	0.1086	5.4	0.89	9.2054	5.4	0.0611	2.5	643	53	660	29	665	34	-3
3KE044 L 289	1	310	610	52	1.97	1546	0.889	4.6	0.1043	3.7	0.79	9.5867	3.7	0.0618	2.6	667	56	646	22	640	23	4
3KE044 L 290	1	493	1147	91	2.33	1406	0.907	4.1	0.1058	3.7	0.86	9.4562	3.7	0.0622	1.8	682	39	656	20	648	23	5
3KE044 L 291	1	91	109	14	1.20	175	0.933	8.0	0.1117	5.9	0.72	8.9492	5.9	0.0606	5.4	624	117	669	39	683	38	-9
3KE044 L 293	1	334	607	55	1.82	863	0.899	5.5	0.1049	4.9	0.86	9.5338	4.9	0.0622	2.6	680	55	651	26	643	30	5
3KE044 L 295	1	66	82	10	1.24	150	0.894	7.0	0.1038	4.7	0.64	9.6332	4.7	0.0624	5.3	689	113	648	34	637	28	8
3KE044 L 296	1	144	201	25	1.40	518	1.017	10.5	0.1168	9.3	0.88	8.5597	9.3	0.0631	4.9	713	103	712	54	712	62	0
3KE044 L 300	1	195	206	28	1.06	3519	0.891	5.7	0.1028	4.6	0.78	9.7263	4.6	0.0628	3.4	702	72	647	27	631	27	10
3KE044 L 301	1	277	348	45	1.26	831	0.951	5.9	0.1089	4.6	0.75	9.1865	4.6	0.0633	3.8	720	80	678	29	666	29	7
3KE044 L 303	1	258	352	41	1.36	507	0.875	4.8	0.1022	4.1	0.82	9.7831	4.1	0.0621	2.5	676	54	638	23	627	24	7
3KE044 L 304	1	163	192	25	1.18	561	0.893	6.5	0.1049	5.0	0.75	9.5347	5.0	0.0618	4.1	666	88	648	31	643	30	3
3KE044 L 306	1	250	283	39	1.13	3431	0.885	6.5	0.1066	5.6	0.85	9.3852	5.6	0.0602	3.2	613	69	644	31	653	35	-7
3KE044 L 309	1	176	248	31	1.40	8866	0.950	6.4	0.1093	5.3	0.82	9.1518	5.3	0.0630	3.5	709	74	678	32	668	34	6

3KE044 L 310	1	487	899	90	1.85	1146	0.891	4.7	0.1056	4.4	0.91	9.4660	4.4	0.0612	1.6	646	35	647	23	647	27	0
3KE044 L 311	1	269	331	43	1.23	1024	0.895	5.4	0.1058	4.6	0.84	9.4523	4.6	0.0614	2.7	653	58	649	26	648	29	1
3KE044 L 312	1	206	236	33	1.15	717	0.894	5.7	0.1063	4.2	0.71	9.4081	4.2	0.0610	3.9	639	83	649	27	651	26	-2
3KE044 L 313	1	172	171	27	0.99	1715	0.912	4.6	0.1093	3.4	0.70	9.1518	3.4	0.0605	3.1	623	67	658	22	668	21	-7
3KE044 L 314	1	309	466	53	1.51	2768	0.887	4.5	0.1040	3.9	0.84	9.6148	3.9	0.0619	2.1	669	46	645	21	638	24	5
3KE044 L 315	1	568	883	103	1.55	1602	0.910	4.7	0.1063	4.2	0.86	9.4059	4.2	0.0621	2.2	678	47	657	23	651	26	4
3KE044 L 318	1	394	386	61	0.98	1436	0.901	4.7	0.1067	4.0	0.83	9.3761	4.0	0.0613	2.4	649	52	652	23	653	25	-1
3KE044 L 320	1	338	461	57	1.36	2651	0.903	4.9	0.1054	4.4	0.87	9.4905	4.4	0.0622	2.1	680	45	653	24	646	27	5
3KE044 L 321	1	409	323	60	0.79	3022	0.891	5.8	0.1064	4.1	0.69	9.3981	4.1	0.0607	4.0	630	86	647	28	652	26	-3
3KE044 L 322	1	222	233	35	1.05	1095	0.919	4.2	0.1083	3.0	0.66	9.2299	3.0	0.0615	3.0	657	64	662	20	663	19	-1
3KE044 L 323	1	335	323	52	0.96	2219	0.921	5.5	0.1078	4.8	0.85	9.2778	4.8	0.0620	2.6	674	57	663	27	660	30	2
3KE044 L 324	1	383	413	58	1.08	859	0.876	5.9	0.1020	5.3	0.89	9.8029	5.3	0.0622	2.5	683	53	639	28	626	32	8
3KE044 L 325	1	311	389	51	1.25	662	0.897	5.4	0.1048	4.4	0.79	9.5460	4.4	0.0621	3.2	678	67	650	26	642	27	5
3KE044 L 326	1	135	117	19	0.87	1400	0.889	6.3	0.1035	4.7	0.73	9.6628	4.7	0.0623	4.2	683	89	646	30	635	29	7
>10% discordant																						
3KE044 L 262	1	103	557	28	5.43	245	0.912	5.6	0.1030	3.7	0.64	9.7128	3.7	0.0642	4.1	749	87	658	27	632	22	16

3KE044 L 272	1	535	1489	108	2.78	1300	0.901	6.3	0.1017	5.7	0.89	9.8295	5.7	0.0643	2.6	750	56	653	30	625	34	17
3KE044 L 274	1	38	89	7	2.34	315	0.963	7.4	0.1052	3.7	0.47	9.5035	3.7	0.0663	6.4	817	134	685	37	645	22	21
3KE044 L 275	1	133	180	27	1.35	732	1.164	9.0	0.1365	8.2	0.90	7.3239	8.2	0.0618	3.7	668	79	784	49	825	64	-24
3KE044 L 276	1	197	929	54	4.72	1059	0.911	7.4	0.1039	5.8	0.77	9.6291	5.8	0.0636	4.6	729	97	658	36	637	35	13
3KE044 L 279	1	112	183	21	1.63	1427	1.116	11.1	0.1050	4.8	0.42	9.5213	4.8	0.0771	10.0	1123	199	761	59	644	30	43
3KE044 L 280	1	345	345	55	1.00	1817	0.997	7.2	0.1090	4.2	0.55	9.1762	4.2	0.0664	5.9	819	124	703	37	667	26	19
3KE044 L 282	1	328	489	58	1.49	3572	0.887	6.0	0.1100	5.0	0.82	9.0910	5.0	0.0585	3.3	547	72	645	29	673	32	-23
3KE044 L 283	1	193	237	30	1.23	368	0.931	6.1	0.1022	5.3	0.85	9.7874	5.3	0.0661	3.0	810	63	668	30	627	32	23
3KE044 L 285	1	22	35	4	1.58	960	0.898	9.3	0.1110	5.0	0.52	9.0069	5.0	0.0587	7.9	555	172	651	45	679	32	-22
3KE044 L 294	1	55	82	12	1.49	330	1.126	7.3	0.1212	5.8	0.78	8.2493	5.8	0.0674	4.5	849	93	766	39	738	40	13
3KE044 L 297	1	37	62	6	1.69	300	0.841	8.4	0.1044	5.3	0.62	9.5796	5.3	0.0584	6.5	546	142	620	39	640	32	-17
3KE044 L 298	1	78	69	11	0.88	1653	0.853	8.4	0.1055	6.3	0.74	9.4790	6.3	0.0586	5.6	553	121	626	39	647	39	-17
3KE044 L 299	1	172	182	24	1.06	6736	0.892	6.1	0.1016	4.8	0.77	9.8405	4.8	0.0637	3.8	730	81	647	29	624	29	15
3KE044 L 302	1	341	1400	88	4.10	1270	0.901	5.4	0.1031	4.9	0.87	9.7032	4.9	0.0634	2.4	722	51	652	26	632	29	12
3KE044 L 305	1	61	45	8	0.74	324	0.920	8.6	0.1046	5.3	0.61	9.5634	5.3	0.0638	6.7	735	142	662	42	641	33	13
3KE044 L 307	1	501	1306	108	2.61	1646	0.928	6.1	0.1057	5.8	0.94	9.4636	5.8	0.0637	1.7	732	36	667	30	648	36	11

3KE044 L 308	1	424	661	72	1.56	1553	0.900	5.3	0.1020	4.7	0.87	9.8049	4.7	0.0640	2.4	743	51	652	26	626	28	16
3KE044 L 316	1	54	37	8	0.68	198	0.892	8.7	0.1122	5.0	0.56	8.9146	5.0	0.0576	7.2	516	158	647	42	685	32	-33
3KE044 L 317	1	105	77	15	0.74	297	0.914	6.5	0.1116	4.4	0.66	8.9589	4.4	0.0594	4.8	581	103	659	31	682	28	-17
3KE044 L 319	1	146	116	21	0.80	1174	0.951	6.3	0.1073	4.5	0.70	9.3164	4.5	0.0643	4.4	750	92	679	31	657	28	12

Analysis	notes	U ppm	Th ppm	Pb ppm	^{206}Pb / Th/U	^{207}Pb / ^{204}Pb	±2s ^{235}U	^{206}Pb (%)	±2s ^{238}U	error (%)	^{238}U corr.	±2s ^{206}Pb	^{207}Pb (%)	±2s ^{206}Pb	^{207}Pb (%)	±2s ^{206}Pb	^{207}Pb (abs)	±2s ^{235}U	^{206}Pb (abs)	±2s ^{238}U	% (abs)	disc.

09RL762
<10% discordant

09RL762 L 1	1	97	76	13	0.79	229	0.865	8.9	0.1045	3.7	0.41	9.5663	3.7	0.0600	8.1	604	174	633	42	641	23	-6
09RL762 L 2	1	151	44	18	0.29	181	0.897	6.2	0.1037	3.9	0.61	9.6432	3.9	0.0627	4.8	700	103	650	30	636	24	9
09RL762 L 3	1	251	47	30	0.19	1814	0.886	7.5	0.1061	5.1	0.67	9.4289	5.1	0.0606	5.5	625	119	644	36	650	31	-4
09RL762 L 4	1	177	42	22	0.24	268	0.939	6.1	0.1113	4.7	0.76	8.9877	4.7	0.0612	3.9	646	83	672	30	680	30	-5
09RL762 L 5	1	139	102	20	0.73	659	0.967	7.0	0.1131	4.3	0.60	8.8384	4.3	0.0620	5.6	674	119	687	35	691	28	-2
09RL762 L 8	1	147	143	23	0.97	248	0.990	6.9	0.1132	3.1	0.43	8.8321	3.1	0.0634	6.1	722	130	699	35	691	20	4
09RL762 L 11	1	88	178	17	2.03	#DIV/0!	1.041	8.5	0.1216	5.8	0.68	8.2224	5.8	0.0621	6.1	676	131	724	44	740	41	-9
09RL762 L 15	1	141	85	20	0.60	7312	0.965	6.9	0.1137	4.1	0.59	8.7930	4.1	0.0615	5.5	657	118	686	34	694	27	-6

09RL762 L 16	1	398	68	48	0.17	2363	0.939	7.9	0.1078	7.0	0.88	9.2746	7.0	0.0632	3.6	714	77	673	39	660	44	8
09RL762 L 17	1	706	109	80	0.15	4372	0.836	4.9	0.1000	4.1	0.83	9.9975	4.1	0.0606	2.6	626	56	617	23	615	24	2
09RL762 L 18	1	595	111	71	0.19	3186	0.895	5.2	0.1057	4.5	0.85	9.4570	4.5	0.0614	2.7	652	57	649	25	648	28	1
09RL762 L 20	1	270	90	34	0.33	307	0.907	5.6	0.1086	4.4	0.78	9.2088	4.4	0.0606	3.4	624	74	655	27	665	28	-7
09RL762 L 22	1	89	79	13	0.89	1111	0.929	9.1	0.1104	3.6	0.39	9.0595	3.6	0.0610	8.4	640	181	667	45	675	23	-5
09RL762 L 23	1	214	125	29	0.58	713	0.934	6.7	0.1101	4.0	0.58	9.0805	4.0	0.0615	5.4	658	116	670	33	673	25	-2
09RL762 L 27	1	152	50	19	0.33	1581	0.932	8.1	0.1081	4.4	0.53	9.2536	4.4	0.0625	6.9	693	147	669	40	662	27	5
09RL762 L 28	1	171	37	20	0.21	601	0.873	6.4	0.1035	4.7	0.72	9.6580	4.7	0.0611	4.4	643	94	637	30	635	28	1
09RL762 L 29	1	412	319	59	0.77	1490	0.944	4.6	0.1088	3.8	0.81	9.1887	3.8	0.0629	2.5	706	54	675	23	666	24	6
09RL762 L 32	1	483	125	59	0.26	1690	0.880	7.0	0.1054	5.9	0.84	9.4917	5.9	0.0606	3.7	624	81	641	33	646	36	-3
09RL762 L 34	1	153	65	18	0.42	1422	0.825	8.0	0.1008	3.8	0.46	9.9172	3.8	0.0593	7.1	578	153	611	37	619	22	-7
09RL762 L 36	1	355	50	44	0.14	892	0.939	5.7	0.1117	4.4	0.77	8.9547	4.4	0.0610	3.6	639	77	673	28	682	29	-7
09RL762 L 37	1	619	180	76	0.29	7620	0.904	5.0	0.1050	4.2	0.82	9.5224	4.2	0.0624	2.7	689	58	654	24	644	25	7
09RL762 L 40	1	286	71	34	0.25	3690	0.895	4.3	0.1062	2.6	0.59	9.4128	2.6	0.0611	3.4	642	72	649	20	651	16	-1
09RL762 L 41	1	522	61	61	0.12	2244	0.889	6.7	0.1052	5.5	0.81	9.5075	5.5	0.0613	3.9	650	84	646	32	645	34	1
09RL762 L 43	1	337	58	40	0.17	1299	0.911	5.5	0.1065	4.2	0.74	9.3926	4.2	0.0620	3.6	675	76	657	26	652	26	3

09RL762 L 44	1	292	179	39	0.61	555	0.875	7.4	0.1044	6.5	0.87	9.5806	6.5	0.0608	3.6	632	77	638	35	640	40 -1
09RL762 L 45	1	156	141	25	0.91	343	1.047	6.2	0.1176	4.0	0.63	8.5015	4.0	0.0646	4.8	761	101	728	32	717	27 6
09RL762 L 48	1	197	86	26	0.44	2058	0.924	6.5	0.1100	4.0	0.61	9.0924	4.0	0.0610	5.1	638	110	665	32	673	26 -5
09RL762 L 52	1	373	134	48	0.36	300	0.932	5.0	0.1069	3.5	0.68	9.3560	3.5	0.0633	3.6	717	76	669	25	655	22 9
09RL762 L 53	1	541	101	62	0.19	8146	0.871	4.3	0.1012	3.2	0.73	9.8854	3.2	0.0624	2.8	689	61	636	20	621	19 10
09RL762 L 54	1	368	90	46	0.25	661	0.960	5.2	0.1089	3.5	0.67	9.1840	3.5	0.0639	3.8	740	80	683	26	666	22 10
09RL762 L 55	1	526	70	63	0.13	5071	0.924	6.1	0.1081	4.6	0.73	9.2534	4.6	0.0620	4.1	675	88	664	30	662	29 2
09RL762 L 56	1	567	607	84	1.07	1515	0.887	5.0	0.1074	4.3	0.83	9.3089	4.3	0.0599	2.7	600	57	645	24	658	27 -10
09RL762 L 58	1	252	165	32	0.65	3367	0.836	6.3	0.0987	4.0	0.62	10.1289	4.0	0.0614	4.9	653	106	617	29	607	23 7
09RL762 L 59	1	246	81	31	0.33	938	0.927	6.1	0.1074	4.1	0.66	9.3119	4.1	0.0626	4.5	695	95	666	30	658	26 5
09RL762 L 60	1	359	359	53	1.00	1092	0.959	4.8	0.1108	3.8	0.78	9.0278	3.8	0.0628	2.9	701	61	683	24	677	25 3
09RL762 L 61	1	540	104	62	0.19	826	0.854	6.8	0.1014	5.7	0.84	9.8571	5.7	0.0610	3.6	640	78	627	32	623	34 3
09RL762 L 65	1	295	59	36	0.20	1512	0.901	6.2	0.1080	3.8	0.60	9.2593	3.8	0.0605	4.9	623	105	653	30	661	24 -6
09RL762 L 67	1	189	594	41	3.15	197	0.928	7.2	0.1086	4.7	0.65	9.2091	4.7	0.0620	5.4	673	115	667	35	665	30 1
09RL762 L 73	1	149	65	19	0.43	412	0.932	7.8	0.1088	5.7	0.72	9.1878	5.7	0.0621	5.3	677	114	669	38	666	36 2
09RL762 L 75	1	589	101	67	0.17	14788	0.839	4.1	0.1007	3.5	0.83	9.9311	3.5	0.0604	2.2	619	47	619	19	618	21 0

09RL762 L 80	1	457	70	53	0.15	2819	0.863	5.7	0.1051	4.3	0.74	9.5147	4.3	0.0595	3.8	587	81	632	27	644	26	-10
09RL762 L 82	1	110	64	14	0.59	255	0.873	8.2	0.1048	5.2	0.63	9.5396	5.2	0.0604	6.3	618	136	637	39	643	32	-4
09RL762 L 83	1	408	43	46	0.10	11818	0.864	5.1	0.1026	3.5	0.67	9.7473	3.5	0.0611	3.7	642	79	632	24	630	21	2
09RL762 L 84	1	650	72	78	0.11	213969	0.936	4.5	0.1072	3.4	0.75	9.3304	3.4	0.0633	2.9	720	61	671	22	656	21	9
09RL762 L 86	1	263	107	34	0.41	548	0.921	5.7	0.1097	3.8	0.65	9.1158	3.8	0.0609	4.3	635	93	663	28	671	24	-6
09RL762 L 87	1	227	57	29	0.25	4502	0.969	7.7	0.1119	6.4	0.83	8.9365	6.4	0.0628	4.3	702	91	688	39	684	42	3
09RL762 L 89	1	223	161	32	0.72	2470	0.984	6.4	0.1123	4.4	0.67	8.9078	4.4	0.0636	4.7	727	99	696	32	686	28	6
09RL762 s 901	156	71	20	0.45	604	0.895	8.6	0.1036	5.9	0.67	9.6493	5.9	0.0627	6.4	697	135	649	41	636	35	9	
09RL762 s 951	244	254	37	1.04	345	0.868	7.7	0.1050	5.3	0.68	9.5236	5.3	0.0600	5.6	603	122	635	37	644	32	-7	
09RL762 s 101	1	379	136	43	0.36	1121	0.813	5.0	0.0967	3.8	0.76	10.3371	3.8	0.0609	3.1	637	67	604	23	595	22	7
09RL762 s 102	1	348	187	43	0.54	299565	0.812	6.7	0.0996	4.9	0.73	10.0356	4.9	0.0591	4.5	571	98	604	30	612	29	-7
09RL762 s 105	1	440	487	68	1.11	2115	0.903	5.4	0.1064	3.8	0.69	9.3991	3.8	0.0615	3.9	658	83	653	26	652	24	1
09RL762 s 106	1	598	192	73	0.32	3191	0.855	5.5	0.1024	4.8	0.87	9.7659	4.8	0.0605	2.6	623	56	627	26	628	29	-1
09RL762 s 107	1	672	111	73	0.16	1028	0.800	4.4	0.0953	3.5	0.78	10.4923	3.5	0.0609	2.6	634	57	597	20	587	20	8
09RL762 s 108	1	310	257	46	0.83	1871	0.939	6.1	0.1097	4.8	0.77	9.1174	4.8	0.0621	3.8	678	81	673	30	671	31	1
09RL762 s 109	1	459	189	60	0.41	15246	0.904	4.8	0.1079	3.7	0.76	9.2707	3.7	0.0608	3.1	632	66	654	23	660	23	-5

09RL762 s 110	1	580	218	74	0.38	5104	0.896	4.3	0.1064	3.5	0.79	9.4020	3.5	0.0611	2.5	642	55	650	21	652	21	-1
09RL762 s 111	1	586	314	79	0.54	2420	0.897	4.5	0.1066	3.6	0.79	9.3838	3.6	0.0610	2.6	640	57	650	22	653	23	-2
09RL762 s 112	1	618	113	70	0.18	5836	0.843	4.6	0.0989	3.5	0.74	10.1100	3.5	0.0618	3.0	667	65	621	22	608	20	9
09RL762 s 113	1	608	499	87	0.82	10359	0.892	6.1	0.1065	5.5	0.90	9.3913	5.5	0.0608	2.5	631	54	647	29	652	34	-3
09RL762 s 115	1	369	97	46	0.26	477	0.919	4.9	0.1093	3.3	0.66	9.1497	3.3	0.0610	3.6	639	77	662	24	669	21	-5
09RL762 s 116	1	738	639	109	0.87	4819	0.887	5.9	0.1075	5.1	0.85	9.3062	5.1	0.0599	2.9	600	64	645	28	658	32	-10
09RL762 s 119	1	596	151	73	0.25	2878	0.899	5.4	0.1057	4.1	0.74	9.4602	4.1	0.0617	3.6	663	76	651	26	648	25	2
09RL762 s 121	1	630	100	73	0.16	2074	0.841	4.3	0.1020	3.4	0.78	9.7991	3.4	0.0598	2.6	595	55	620	20	626	20	-5
09RL762 s 122	1	479	116	56	0.24	16122	0.840	5.2	0.1003	3.9	0.74	9.9722	3.9	0.0608	3.3	631	72	619	24	616	23	2
09RL762 s 123	1	193	132	26	0.69	576	0.839	7.7	0.1020	4.1	0.52	9.8033	4.1	0.0597	6.5	591	141	619	36	626	24	-6
09RL762 s 125	1	324	117	37	0.36	346	0.800	5.1	0.0960	3.2	0.60	10.4149	3.2	0.0604	4.0	618	86	597	23	591	18	4
09RL762 s 126	1	553	201	66	0.36	58687	0.837	4.9	0.0990	3.9	0.78	10.0969	3.9	0.0613	3.0	650	64	618	23	609	23	6
09RL762 s 128	1	483	478	69	0.99	1478	0.849	5.1	0.1019	4.0	0.77	9.8173	4.0	0.0605	3.2	620	69	624	24	625	24	-1
09RL762 s 129	1	379	494	56	1.30	545	0.824	5.7	0.0985	4.0	0.70	10.1497	4.0	0.0607	4.0	628	86	610	26	606	23	4
09RL762 s 131	2	189	101	24	0.53	832	0.878	5.8	0.1043	4.8	0.82	9.5919	4.8	0.0611	3.3	643	70	640	27	639	29	1
09RL762 s 132	2	331	236	42	0.71	103695	0.791	5.9	0.0970	4.9	0.81	10.3144	4.9	0.0592	3.4	574	74	592	27	597	28	-4

09RL762 s 133	2	272	119	34	0.44	1158	0.879	5.5	0.1053	4.2	0.75	9.4935	4.2	0.0605	3.6	621	77	640	26	646	26	-4
09RL762 s 135	2	289	298	39	1.03	2171	0.831	5.0	0.0985	3.6	0.70	10.1504	3.6	0.0611	3.5	644	76	614	23	606	21	6
09RL762 s 136	2	202	40	22	0.20	1036	0.798	5.1	0.0983	3.3	0.64	10.1697	3.3	0.0588	3.8	561	84	595	23	605	19	-8
09RL762 s 139	2	385	103	46	0.27	548	0.855	6.6	0.1028	5.9	0.89	9.7290	5.9	0.0603	2.9	616	62	628	31	631	36	-2
09RL762 s 140	2	400	95	48	0.24	7349	0.855	6.8	0.1034	5.8	0.85	9.6680	5.8	0.0600	3.6	602	77	627	32	635	35	-5
09RL762 s 142	2	385	85	45	0.22	634	0.848	4.4	0.1028	3.1	0.68	9.7248	3.1	0.0598	3.2	598	69	624	21	631	18	-6
09RL762 s 143	2	91	88	13	0.96	175	0.905	7.2	0.1088	4.4	0.61	9.1911	4.4	0.0603	5.7	615	123	654	35	666	28	-8
09RL762 s 144	2	109	118	15	1.08	421	0.901	6.3	0.1049	4.3	0.67	9.5372	4.3	0.0623	4.6	684	99	652	30	643	26	6
09RL762 s 147	2	188	183	26	0.97	229	0.884	5.6	0.1033	3.5	0.61	9.6760	3.5	0.0620	4.4	675	94	643	27	634	21	6
09RL762 s 148	2	265	119	34	0.45	1458	0.893	5.5	0.1075	4.3	0.77	9.3058	4.3	0.0603	3.4	613	74	648	26	658	27	-7
09RL762 s 149	2	89	84	13	0.94	280	0.953	8.3	0.1117	4.8	0.57	8.9505	4.8	0.0619	6.7	671	144	680	41	683	31	-2
09RL762 s 155	2	299	155	34	0.52	856	0.773	5.4	0.0953	3.2	0.58	10.4973	3.2	0.0589	4.3	563	95	582	24	587	18	-4
<10% discordant																						
09RL762 L 7	1	228	236	35	1.04	426	0.931	7.4	0.1138	5.7	0.77	8.7856	5.7	0.0593	4.6	579	101	668	36	695	38	-20
09RL762 L 12	1	152	211	21	1.39	352	0.797	5.9	0.0911	4.0	0.67	10.9820	4.0	0.0635	4.3	724	92	595	27	562	22	22
09RL762 L 13	1	364	102	40	0.28	644	0.813	5.9	0.0955	4.2	0.69	10.4724	4.2	0.0617	4.2	665	90	604	27	588	23	12

09RL762 L 19	1	280	80	26	0.29	943	0.712	5.6	0.0813	3.9	0.69	12.3013	3.9	0.0636	4.0	727	85	546	24	504	19	31
09RL762 L 21	1	138	61	16	0.44	3402	0.786	10.8	0.0986	5.3	0.49	10.1412	5.3	0.0578	9.4	523	206	589	48	606	31	-16
09RL762 L 26	1	252	158	37	0.63	202	1.025	7.0	0.1207	6.2	0.88	8.2859	6.2	0.0616	3.3	660	70	716	36	735	43	-11
09RL762 L 31	1	201	84	25	0.42	243	0.920	7.3	0.1040	5.9	0.80	9.6191	5.9	0.0642	4.3	748	90	662	35	638	36	15
09RL762 L 33	1	188	38	20	0.20	826	0.831	6.0	0.0949	3.9	0.64	10.5417	3.9	0.0635	4.5	726	95	614	27	584	22	19
09RL762 L 42	1	571	107	63	0.19	1116	0.843	6.0	0.0975	4.8	0.80	10.2583	4.8	0.0627	3.5	698	74	621	28	600	28	14
09RL762 L 47	1	314	82	37	0.26	55591	0.906	4.5	0.1022	3.2	0.68	9.7819	3.2	0.0643	3.2	751	68	655	22	627	19	16
09RL762 L 49	1	200	123	26	0.61	1296	0.937	5.9	0.1044	3.9	0.65	9.5782	3.9	0.0651	4.4	778	92	672	29	640	24	18
09RL762 L 51	1	67	71	10	1.07	300	0.879	11.2	0.1117	6.0	0.53	8.9518	6.0	0.0571	9.4	495	207	641	53	683	39	-38
09RL762 L 63	1	334	49	39	0.15	715	0.844	5.6	0.1042	3.0	0.51	9.5948	3.0	0.0587	4.8	557	104	621	26	639	18	-15
09RL762 L 68	1	320	51	35	0.16	787	0.839	4.8	0.0972	3.7	0.75	10.2914	3.7	0.0626	3.1	694	65	618	22	598	21	14
09RL762 L 74	1	145	67	17	0.46	991	0.815	7.5	0.0954	4.8	0.63	10.4767	4.8	0.0619	5.8	671	123	605	34	588	27	12
09RL762 L 81	1	139	72	19	0.52	6161	0.918	10.4	0.1108	6.2	0.59	9.0248	6.2	0.0601	8.4	606	181	661	51	677	40	-12
09RL762 L 85	1	163	124	24	0.76	443	0.915	6.3	0.1152	3.0	0.46	8.6819	3.0	0.0576	5.5	516	122	660	31	703	20	-36
09RL762 s 91	1	577	111	64	0.19	1093	0.857	4.7	0.0971	3.9	0.80	10.3020	3.9	0.0640	2.7	742	57	628	22	597	22	20
09RL762 s 93	1	387	75	36	0.19	854	0.667	7.1	0.0817	5.5	0.77	12.2415	5.5	0.0593	4.5	577	97	519	29	506	27	12

09RL762 s 96	1	310	54	33	0.17	1019	0.836	6.4	0.0962	4.6	0.71	10.3929	4.6	0.0631	4.5	710	95	617	30	592	26	17
09RL762 s 97	1	424	65	43	0.15	663	0.784	6.0	0.0903	3.7	0.60	11.0792	3.7	0.0630	4.8	707	101	587	27	557	20	21
09RL762 s 98	1	194	131	28	0.67	1499	0.993	9.0	0.1113	6.9	0.76	8.9837	6.9	0.0647	5.7	764	121	700	45	680	44	11
09RL762 s 99	1	254	98	28	0.38	6806	0.816	6.0	0.0935	3.8	0.61	10.6911	3.8	0.0632	4.7	716	99	606	27	576	21	20
09RL762 s 100	1	323	77	37	0.24	831	0.868	5.7	0.1004	3.8	0.65	9.9609	3.8	0.0627	4.3	698	91	634	27	617	22	12
09RL762 s 103	1	185	194	27	1.05	1893	0.922	7.0	0.1038	4.7	0.67	9.6316	4.7	0.0644	5.2	756	109	664	34	637	29	16
09RL762 s 118	1	757	326	95	0.43	1362	0.890	4.1	0.1024	3.6	0.86	9.7641	3.6	0.0630	1.9	708	41	646	20	629	22	11
09RL762 s 120	1	504	437	74	0.87	2672	0.894	5.7	0.1099	4.7	0.81	9.1029	4.7	0.0590	3.2	567	70	648	27	672	30	-19
09RL762 s 124	1	272	115	37	0.42	2161	0.922	6.5	0.1123	4.6	0.70	8.9046	4.6	0.0595	4.5	586	99	663	31	686	30	-17
09RL762 s 127	1	591	403	74	0.68	1233	0.818	4.1	0.0960	3.0	0.71	10.4141	3.0	0.0618	2.8	667	59	607	19	591	17	11
09RL762 s 130	1	468	364	64	0.78	772	0.893	5.2	0.1015	4.1	0.77	9.8536	4.1	0.0638	3.3	735	69	648	25	623	24	15
09RL762 s 138	2	227	69	28	0.30	4155	0.866	6.5	0.1074	4.8	0.73	9.3085	4.8	0.0585	4.4	547	96	633	31	658	30	-20
09RL762 s 145	2	196	145	27	0.74	4054	0.863	4.1	0.1058	2.7	0.65	9.4486	2.7	0.0591	3.0	572	66	632	19	649	17	-13
09RL762 s 151	2	166	148	23	0.89	512	0.888	6.5	0.1080	4.4	0.68	9.2620	4.4	0.0597	4.7	591	102	645	31	661	28	-12
09RL762 s 152	2	380	62	40	0.16	2211	0.816	5.2	0.0954	4.2	0.80	10.4844	4.2	0.0621	3.0	677	65	606	24	587	24	13

U Th Pb ^{206}Pb ^{207}Pb ±2s ^{206}Pb ±2s error ^{238}U ±2s ^{207}Pb ±2s ^{207}Pb ±2s ^{207}Pb ±2s ^{206}Pb ±2s %

Analysis	notes	ppm	ppm	ppm	Th/U	^{204}Pb	^{235}U	(%)	^{238}U	(%)	corr.	^{206}Pb	(%)	^{206}Pb	(%)	^{206}Pb	(abs)	^{235}U	(abs)	^{238}U	(abs)	disc.
15VI003																						
<10% discordant																						
15VI003 M 501	1	309	193	45	0.63	33314	0.958	5.1	0.1111	4.5	0.87	8.9986	4.5	0.0625	2.5	692	53	682	26	679	29	2
15VI003 M 502	1	368	331	58	0.90	1914	0.982	3.7	0.1143	3.3	0.88	8.7489	3.3	0.0623	1.7	685	37	695	18	698	22	-2
15VI003 M 503	1	269	251	44	0.93	2103	0.989	4.3	0.1158	3.6	0.84	8.6331	3.6	0.0619	2.4	671	50	698	22	707	24	-5
15VI003 M 505	1	320	233	47	0.73	1605	0.947	3.5	0.1099	3.1	0.87	9.1029	3.1	0.0626	1.7	693	37	677	17	672	20	3
15VI003 M 506	1	506	483	82	0.95	2763	1.027	4.2	0.1186	3.8	0.91	8.4339	3.8	0.0628	1.8	702	38	717	21	722	26	-3
15VI003 M 510	1	362	233	52	0.65	1844	0.947	4.3	0.1091	3.9	0.89	9.1650	3.9	0.0630	1.9	707	41	677	21	668	25	6
15VI003 M 513	1	659	778	108	1.18	4517	0.985	3.4	0.1149	2.5	0.75	8.7011	2.5	0.0622	2.2	680	48	696	17	701	17	-3
15VI003 M 514	1	425	311	65	0.73	14018	0.990	3.5	0.1154	2.9	0.83	8.6628	2.9	0.0622	2.0	681	42	699	18	704	20	-3
15VI003 M 517	1	448	370	68	0.83	2739	0.976	3.5	0.1125	2.7	0.78	8.8896	2.7	0.0629	2.2	706	46	692	17	687	18	3
15VI003 M 518	1	330	266	55	0.81	1565	1.020	3.8	0.1185	3.4	0.90	8.4422	3.4	0.0625	1.7	690	36	714	20	722	23	-5
15VI003 M 521	2	348	290	56	0.83	2817	0.960	3.7	0.1132	3.1	0.83	8.8337	3.1	0.0615	2.1	658	45	683	19	691	20	-5
15VI003 M 522	2	383	299	60	0.78	7138	0.970	3.7	0.1133	3.3	0.89	8.8279	3.3	0.0621	1.7	678	36	689	18	692	21	-2
15VI003 M 523	2	315	211	47	0.67	409078	0.967	3.8	0.1116	3.3	0.86	8.9596	3.3	0.0628	1.9	702	41	687	19	682	21	3

15VI003 M 524	2	696	809	116	1.16	8311	0.955	4.9	0.1107	4.6	0.95	9.0344	4.6	0.0626	1.6	695	34	681	24	677	30	3
15VI003 M 525	2	467	667	84	1.43	1168	0.951	4.4	0.1123	3.9	0.89	8.9058	3.9	0.0614	2.0	653	44	678	22	686	25	-5
15VI003 M 527	2	384	299	56	0.78	1629	0.938	3.5	0.1075	3.1	0.88	9.3039	3.1	0.0633	1.6	719	35	672	17	658	19	8
15VI003 M 530	2	221	176	34	0.80	5457	0.989	5.7	0.1118	5.0	0.88	8.9407	5.0	0.0641	2.7	746	57	698	29	683	32	8
15VI003 M 531	2	746	756	117	1.01	2115	0.957	4.3	0.1093	4.1	0.96	9.1477	4.1	0.0635	1.2	724	24	682	21	669	26	8
15VI003 M 533	2	451	438	72	0.97	1216	0.960	3.9	0.1125	3.2	0.82	8.8896	3.2	0.0619	2.2	671	48	683	19	687	21	-2
15VI003 M 536	2	238	205	38	0.86	2637	0.998	4.5	0.1142	3.7	0.83	8.7575	3.7	0.0634	2.5	722	53	703	23	697	25	3
15VI003 M 537	2	648	683	107	1.05	2925	0.982	3.8	0.1136	3.4	0.91	8.8039	3.4	0.0627	1.6	699	33	695	19	694	23	1
15VI003 M 540	2	233	159	35	0.68	47122	0.967	3.5	0.1128	2.9	0.83	8.8654	2.9	0.0622	1.9	681	42	687	18	689	19	-1
15VI003 M 543	2	538	537	84	1.00	4400	0.950	2.8	0.1093	2.3	0.81	9.1485	2.3	0.0630	1.6	710	35	678	14	669	14	6
15VI003 M 544	2	411	335	63	0.82	2626	0.949	2.6	0.1118	2.0	0.78	8.9449	2.0	0.0616	1.6	659	35	677	13	683	13	-4
15VI003 M 545	2	247	170	36	0.69	3345	0.952	3.0	0.1104	2.1	0.68	9.0548	2.1	0.0625	2.2	692	47	679	15	675	13	2
15VI003 M 547	2	589	608	97	1.03	4042	1.007	3.2	0.1149	3.0	0.93	8.7062	3.0	0.0636	1.2	728	25	707	17	701	20	4
15VI003 S 559	2	382	325	59	0.85	5128	0.970	5.8	0.1112	5.4	0.94	8.9940	5.4	0.0633	2.0	718	43	689	29	680	35	5
15VI003 S 563	2	493	569	83	1.15	4619	0.974	5.9	0.1119	5.6	0.95	8.9370	5.6	0.0631	1.8	713	39	690	30	684	37	4
15VI003 S 568	2	635	1741	126	2.74	7240	0.990	5.2	0.1117	4.9	0.94	8.9494	4.9	0.0643	1.7	751	37	699	26	683	32	9

15VI003 S 575	2	164	125	24	0.76	3163	0.961	5.0	0.1099	3.7	0.75	9.0958	3.7	0.0634	3.3	720	69	684	25	672	24	7
15VI003 S 576	2	725	1074	127	1.48	21083	1.015	6.7	0.1160	6.4	0.97	8.6209	6.4	0.0635	1.7	725	36	712	34	707	43	2
15VI003 S 580	2	422	576	75	1.36	4847	1.013	5.8	0.1180	5.5	0.94	8.4716	5.5	0.0622	1.9	682	41	710	30	719	37	-5
15VI003 S 591	2	423	415	66	0.98	10994	1.018	3.7	0.1144	3.3	0.88	8.7428	3.3	0.0646	1.7	760	36	713	19	698	22	8
15VI003 S 596	2	523	829	91	1.58	3186	0.963	4.4	0.1139	4.0	0.92	8.7769	4.0	0.0613	1.7	650	37	685	22	696	26	-7
15VI003 S 597	2	389	540	65	1.39	4867	0.986	4.1	0.1124	3.7	0.91	8.8989	3.7	0.0636	1.7	729	37	697	21	687	24	6
15VI003 S 600	2	341	322	55	0.95	5115	1.013	4.4	0.1171	3.9	0.90	8.5425	3.9	0.0628	1.9	700	40	710	22	714	27	-2
15VI003 S 605	2	645	592	104	0.92	21724	0.986	4.8	0.1134	4.6	0.96	8.8152	4.6	0.0630	1.4	709	29	697	24	693	30	2
15VI003 S 606	2	500	808	93	1.62	4453	0.974	5.4	0.1127	5.1	0.94	8.8731	5.1	0.0627	1.8	697	38	690	27	688	33	1
15VI003 S 608	2	959	1646	183	1.72	9454	0.987	4.7	0.1124	4.5	0.95	8.8933	4.5	0.0637	1.4	731	30	697	24	687	29	6
15VI003 S 609	2	393	335	63	0.85	9751	0.986	4.6	0.1147	4.3	0.92	8.7158	4.3	0.0623	1.8	684	39	696	23	700	28	-2
15VI003 S 611	2	152	89	23	0.59	510	1.049	4.9	0.1181	3.9	0.80	8.4699	3.9	0.0644	2.9	756	62	728	25	719	26	5
15VI003 S 613	2	615	511	95	0.83	6976	1.010	5.0	0.1139	4.7	0.93	8.7761	4.7	0.0643	1.9	752	39	709	26	696	31	8
15VI003 S 614	2	276	191	42	0.69	3952	0.989	4.8	0.1145	4.2	0.88	8.7313	4.2	0.0626	2.3	695	49	698	24	699	28	-1
15VI003 S 618	2	317	278	49	0.88	494206	0.977	4.6	0.1126	4.2	0.92	8.8830	4.2	0.0630	1.8	707	38	692	23	688	28	3
15VI003 S 624	2	349	573	61	1.64	1436	0.954	5.0	0.1119	4.5	0.91	8.9329	4.5	0.0618	2.1	667	45	680	25	684	29	-3

Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{235}U$	±2s (%)	$^{206}Pb/^{238}U$	±2s (%)	error corr.	$^{238}U/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (%)	$^{207}Pb/^{235}U$	±2s (abs)	$^{206}Pb/^{238}U$	±2s (abs)	$^{207}Pb/^{206}Pb$	±2s (abs)	% disc.
15VI003 S 626	2	282	308	45	1.09	3641	0.977	5.1	0.1127	4.6	0.89	8.8757	4.6	0.0629	2.3	705	49	692	26	688	30	2
15VI003 S 6a10	2	238	157	36	0.66	10802	0.998	4.9	0.1163	4.5	0.92	8.5951	4.5	0.0622	1.9	682	40	703	25	709	30	-4
>10% discordant																						
15VI003 M 515	1	549	605	93	1.10	2498	0.995	3.9	0.1185	3.5	0.89	8.4423	3.5	0.0609	1.8	637	38	701	20	722	24	-13
15VI003 M 516	1	447	389	71	0.87	60008	1.164	7.1	0.1117	3.6	0.51	8.9487	3.6	0.0755	6.1	1083	123	784	39	683	23	37
15VI003 M 541	2	251	255	43	1.02	543	1.324	6.7	0.1105	2.5	0.37	9.0530	2.5	0.0869	6.2	1358	119	856	38	675	16	50
15VI003 M 542	2	145	68	20	0.47	1334	1.009	4.6	0.1112	3.1	0.69	8.9967	3.1	0.0658	3.3	801	69	708	23	679	20	15
15VI003 S 569	2	242	203	39	0.84	742	1.055	8.2	0.1159	5.4	0.66	8.6289	5.4	0.0660	6.2	807	130	731	43	707	36	12
15VI003 S 571	2	289	227	44	0.79	2578	1.018	4.9	0.1135	4.0	0.82	8.8117	4.0	0.0650	2.9	776	60	713	25	693	26	11
15VI003 S 579	2	298	337	44	1.13	2475	0.937	4.6	0.1060	4.2	0.91	9.4330	4.2	0.0641	1.9	744	41	671	23	650	26	13
15VI003 S 582	2	785	1476	140	1.88	7300	0.975	4.3	0.1097	4.1	0.94	9.1138	4.1	0.0644	1.5	756	32	691	22	671	26	11
15VI003 S 607	2	350	580	62	1.66	3025	0.987	7.3	0.1092	6.3	0.86	9.1571	6.3	0.0655	3.7	792	77	697	37	668	40	16
15VI003 S 622	2	582	429	81	0.74	1788	0.944	3.5	0.1066	2.4	0.67	9.3816	2.4	0.0643	2.6	750	55	675	17	653	15	13
15VI003 S 625	2	222	179	32	0.81	935	1.013	5.3	0.1109	4.3	0.82	9.0145	4.3	0.0662	3.0	814	63	710	27	678	28	17

DG-1
<10% discordant

DG1 L 21	81	76	12	0.94	532	0.952	6.7	0.1098	5.2	0.77	9.1085	5.2	0.0629	4.3	705	91	679	33	672	33	5
DG1 L 31	88	60	12	0.68	1670	0.943	7.1	0.1091	5.7	0.80	9.1637	5.7	0.0626	4.2	696	90	674	35	668	36	4
DG1 L 41	68	66	10	0.98	127	0.914	6.7	0.1073	4.5	0.68	9.3196	4.5	0.0618	4.9	667	105	659	32	657	28	1
DG1 L 61	95	82	14	0.86	196	0.976	7.3	0.1117	6.2	0.84	8.9559	6.2	0.0634	3.9	722	83	692	37	682	40	5
DG1 L 71	71	51	20	0.71	235	2.358	6.3	0.2163	5.1	0.81	4.6236	5.1	0.0791	3.7	1174	72	1230	45	1262	59	-8
DG1 L 81	81	45	18	0.56	343	1.882	5.4	0.1815	4.4	0.83	5.5089	4.4	0.0752	3.0	1074	60	1075	35	1075	44	0
DG1 L 91	62	60	21	0.97	2907	2.967	6.0	0.2346	5.1	0.84	4.2627	5.1	0.0917	3.3	1462	63	1399	46	1359	62	7
DG1 L 10 0	1	42	30	10	0.71	488	1.865	7.6	0.1805	5.8	0.77	5.5387	5.8	0.0749	4.8	1066	97	1069	50	1070	58
DG1 L 11 -4	1	29	18	7	0.61	445	1.948	7.9	0.1880	6.5	0.81	5.3184	6.5	0.0751	4.6	1072	92	1098	53	1111	66
DG1 L 12 2	1	44	24	6	0.56	181	0.970	7.5	0.1121	4.1	0.55	8.9239	4.1	0.0628	6.2	701	132	688	37	685	27
DG1 L 13 -1	1	61	31	18	0.50	2617	2.700	4.3	0.2302	3.6	0.82	4.3434	3.6	0.0851	2.4	1317	47	1329	32	1336	43
DG1 L 14 -6	1	57	25	17	0.44	420	2.676	5.4	0.2333	4.3	0.78	4.2863	4.3	0.0832	3.4	1274	66	1322	40	1352	52
DG1 L 16 -6	1	55	29	16	0.52	1955	2.714	4.9	0.2353	3.7	0.75	4.2499	3.7	0.0837	3.2	1285	63	1332	37	1362	46
DG1 L 18 -5	1	118	119	34	1.01	602	2.105	5.1	0.1991	4.8	0.95	5.0217	4.8	0.0767	1.6	1112	31	1150	35	1171	52
DG1 L 19 -7	1	66	41	10	0.62	197	0.949	6.8	0.1126	3.4	0.49	8.8839	3.4	0.0611	5.9	644	128	678	34	688	22
DG1 L 20 2	1	212	150	30	0.71	396	0.925	4.5	0.1080	3.7	0.82	9.2577	3.7	0.0621	2.5	677	54	665	22	661	23
DG1 L 22 1	1	73	41	10	0.56	537	0.939	7.2	0.1095	4.8	0.66	9.1289	4.8	0.0622	5.4	680	116	672	36	670	30
DG1 L 23 -8	1	124	64	30	0.51	221	1.946	6.1	0.1905	5.5	0.90	5.2507	5.5	0.0741	2.7	1045	54	1097	41	1124	57

DG1 L 24-7	1	255	112	60	0.44	1828	1.896	5.0	0.1870	4.4	0.89	5.3467	4.4	0.0735	2.2	1028	45	1080	33	1105	45
DG1 L 250	1	40	28	5	0.69	256	0.888	8.3	0.1051	4.6	0.55	9.5125	4.6	0.0612	6.9	648	148	645	39	644	28
DG1 L 26-10	1	92	71	13	0.77	8122	0.897	6.7	0.1084	4.4	0.65	9.2270	4.4	0.0600	5.1	603	109	650	32	663	28
DG1 L 27-3	1	71	57	24	0.81	1502	3.048	5.9	0.2495	5.0	0.84	4.0088	5.0	0.0886	3.1	1396	60	1420	45	1436	65
DG1 L 292	1	148	189	74	1.28	7620	4.954	3.9	0.3217	3.6	0.90	3.1083	3.6	0.1117	1.6	1827	30	1812	33	1798	56
DG1 L 304	1	82	56	12	0.69	144	0.969	7.8	0.1114	4.7	0.60	8.9779	4.7	0.0631	6.2	712	132	688	39	681	30
DG1 L 31-3	1	225	223	69	0.99	1835	2.346	3.9	0.2117	3.5	0.89	4.7233	3.5	0.0804	1.7	1206	33	1226	28	1238	39
DG1 L 33-8	1	75	40	11	0.53	389	0.996	7.4	0.1171	5.2	0.69	8.5374	5.2	0.0616	5.4	662	115	702	38	714	35
DG1 L 34-7	1	319	86	78	0.27	6603	2.186	4.3	0.2054	3.9	0.89	4.8688	3.9	0.0772	1.9	1126	37	1176	30	1204	42
DG1 L 352	1	350	84	126	0.24	2951	4.114	4.4	0.2900	4.1	0.92	3.4479	4.1	0.1029	1.6	1677	30	1657	36	1642	59
DG1 L 36-1	1	33	24	14	0.72	8070	4.872	6.9	0.3233	5.9	0.84	3.0933	5.9	0.1093	3.7	1788	67	1797	58	1806	92
DG1 L 370	1	44	34	20	0.79	4809	5.105	5.1	0.3300	3.5	0.69	3.0300	3.5	0.1122	3.6	1835	66	1837	43	1839	56
DG1 L 406	1	20	9	4	0.47	196	1.942	9.2	0.1811	4.5	0.49	5.5223	4.5	0.0778	8.0	1141	159	1096	61	1073	45
DG1 L 41-4	1	54	38	15	0.71	969	2.328	5.6	0.2118	4.8	0.84	4.7208	4.8	0.0797	3.0	1190	59	1221	40	1239	54
DG1 L 42-10	1	112	60	16	0.54	11870	0.934	7.6	0.1119	5.3	0.70	8.9379	5.3	0.0605	5.4	622	117	670	37	684	34
DG1 L 434	1	104	35	27	0.34	900	2.459	4.8	0.2126	4.3	0.88	4.7037	4.3	0.0839	2.2	1290	42	1260	35	1243	48

DG1 L 446	1	224	76	61	0.34	5647	2.656	5.6	0.2206	4.8	0.84	4.5322	4.8	0.0873	3.0	1367	58	1316	42	1285	56
DG1 L 452	1	77	59	12	0.77	197	1.002	6.6	0.1148	4.9	0.74	8.7094	4.9	0.0633	4.4	718	94	705	34	701	33
DG1 S 469	1	392	148	138	0.38	14241	3.930	8.5	0.2720	8.3	0.98	3.6766	8.3	0.1048	1.7	1710	31	1620	68	1551	114
DG1 S 503	1	296	67	65	0.23	330229	2.030	6.0	0.1883	5.5	0.92	5.3105	5.5	0.0782	2.3	1152	46	1126	41	1112	57
DG1 S 529	1	271	195	38	0.72	587	0.907	6.5	0.1045	4.7	0.72	9.5692	4.7	0.0629	4.5	706	95	655	31	641	28
DG1 S 535	1	254	98	56	0.38	1755	1.949	5.7	0.1820	4.9	0.85	5.4940	4.9	0.0777	2.9	1138	58	1098	38	1078	48
DG1 S 553	1	228	222	60	0.97	1030	2.006	3.9	0.1873	2.7	0.67	5.3396	2.7	0.0777	2.9	1139	57	1118	27	1107	27
DG1 S 56-7	1	83	46	18	0.56	916	1.740	6.2	0.1763	5.4	0.86	5.6737	5.4	0.0716	3.1	974	63	1023	40	1046	52
DG1 S 575	1	99	47	21	0.47	45733	1.829	5.3	0.1746	3.5	0.65	5.7265	3.5	0.0759	4.0	1094	81	1056	35	1038	34
DG1 S 59-8	1	40	22	5	0.56	102	0.852	10.5	0.1037	4.4	0.42	9.6457	4.4	0.0596	9.5	590	207	626	49	636	27
DG1 S 601	1	354	203	82	0.57	1328	1.841	3.8	0.1784	3.4	0.87	5.6066	3.4	0.0749	1.8	1065	37	1060	25	1058	33
DG1 S 61-8	1	157	53	21	0.34	506	0.969	7.4	0.1148	6.2	0.83	8.7093	6.2	0.0612	4.1	647	88	688	37	701	41
DG1 S 626	1	177	72	24	0.41	2042	1.004	6.9	0.1138	5.7	0.82	8.7879	5.7	0.0640	3.9	741	83	706	35	695	37
DG1 S 654	1	169	131	53	0.78	1019	2.745	4.6	0.2275	4.2	0.89	4.3959	4.2	0.0875	2.1	1372	40	1341	35	1321	50
DG1 S 670	1	121	95	29	0.78	1099	1.859	6.5	0.1801	5.4	0.82	5.5533	5.4	0.0749	3.7	1065	74	1067	43	1067	53
DG1 S 688	1	193	170	27	0.88	531	0.886	4.6	0.1030	3.1	0.68	9.7060	3.1	0.0624	3.3	687	71	644	22	632	19

DG1 S 702	1	162	92	47	0.57	564	2.656	6.7	0.2251	6.2	0.93	4.4430	6.2	0.0856	2.5	1329	48	1316	49	1309	73
DG1 S 723	1	159	135	23	0.85	598	0.901	7.5	0.1056	6.1	0.81	9.4665	6.1	0.0619	4.3	670	92	652	36	647	37
DG1 S 738	1	353	151	129	0.43	2120	4.109	5.4	0.2814	5.1	0.93	3.5536	5.1	0.1059	1.9	1730	35	1656	44	1598	72
DG1 S 7510	1	110	55	15	0.50	322	0.979	6.0	0.1106	3.8	0.62	9.0376	3.8	0.0642	4.7	748	99	693	30	677	24
DG1 S 76-2	1	191	115	61	0.60	1218	3.086	5.0	0.2499	4.7	0.93	4.0016	4.7	0.0895	1.8	1416	34	1429	39	1438	61
DG1 S 77-5	1	406	6	82	0.01	1766	1.876	4.6	0.1841	4.3	0.93	5.4310	4.3	0.0739	1.6	1038	33	1072	30	1089	43
DG1 S 784	1	376	456	99	1.21	3705	1.842	5.1	0.1763	4.8	0.93	5.6728	4.8	0.0758	1.8	1090	35	1061	33	1047	46
DG1 S 793	1	150	210	38	1.40	593	1.730	4.3	0.1695	3.2	0.72	5.8984	3.2	0.0740	3.0	1042	60	1020	28	1010	30
DG1 S 8010	1	145	125	20	0.86	211	0.908	6.2	0.1045	3.4	0.54	9.5707	3.4	0.0630	5.2	709	111	656	30	641	21
DG1 S 81-1	1	44	28	6	0.64	129	0.959	8.6	0.1120	4.6	0.53	8.9289	4.6	0.0621	7.3	677	156	683	43	684	30
DG1 S 825	1	101	61	31	0.60	441	3.022	5.8	0.2396	5.2	0.90	4.1733	5.2	0.0915	2.5	1456	48	1413	44	1385	65
DG1 S 836	1	151	109	48	0.72	1385	3.036	6.2	0.2387	5.4	0.87	4.1897	5.4	0.0923	3.0	1473	57	1417	47	1380	67
DG1 S 848	1	117	71	37	0.61	2317	3.141	5.8	0.2413	5.3	0.91	4.1434	5.3	0.0944	2.3	1516	43	1443	45	1394	67
DG1 S 850	1	106	61	14	0.58	448	0.923	6.3	0.1085	4.8	0.76	9.2149	4.8	0.0617	4.1	664	87	664	31	664	30
DG1 S 864	1	63	36	8	0.57	167	0.902	7.6	0.1056	4.1	0.53	9.4694	4.1	0.0619	6.5	672	138	653	37	647	25
DG1 S 879	1	536	333	76	0.62	5409	0.958	7.4	0.1089	4.8	0.65	9.1829	4.8	0.0638	5.6	735	118	682	37	666	30

DG1 S 89 4	1	123	54	17	0.44	1362	0.973	7.6	0.1119	4.7	0.62	8.9379	4.7	0.0631	5.9	710	126	690	38	684	31
DG1 S 91 5	1	200	94	58	0.47	2092	2.855	3.5	0.2316	3.0	0.85	4.3170	3.0	0.0894	1.8	1412	34	1370	26	1343	36
DG1 S 93 6	1	359	133	46	0.37	868	0.934	5.4	0.1077	4.8	0.87	9.2824	4.8	0.0629	2.7	703	57	670	27	660	30
DG1 S 94 4	1	376	141	49	0.38	442	0.923	4.6	0.1075	3.8	0.81	9.3053	3.8	0.0623	2.6	685	56	664	22	658	24
DG1 S 95 -3	1	151	111	21	0.74	316	0.903	4.4	0.1075	3.4	0.76	9.3025	3.4	0.0609	2.8	636	61	653	21	658	21
DG1 S 96 1	1	59	28	8	0.47	2891	0.888	7.8	0.1049	4.5	0.58	9.5318	4.5	0.0614	6.4	652	136	645	37	643	28
DG1 S 97 -1	1	207	190	57	0.92	1878	2.116	4.0	0.1970	3.5	0.87	5.0766	3.5	0.0779	1.9	1145	38	1154	28	1159	37
DG1 S 98 3	1	213	142	56	0.66	767	2.208	4.4	0.1989	3.8	0.85	5.0277	3.8	0.0805	2.3	1210	45	1184	31	1169	41
DG1 S 99 3	1	120	112	34	0.94	574	2.308	5.0	0.2050	3.7	0.74	4.8790	3.7	0.0817	3.3	1238	64	1215	35	1202	41
DG1 S 100 2	1	104	62	28	0.60	622	2.352	5.7	0.2081	4.6	0.81	4.8054	4.6	0.0820	3.4	1245	66	1228	41	1219	51
DG1 S 103 3	1	437	88	91	0.20	1761	1.854	5.5	0.1777	5.2	0.93	5.6271	5.2	0.0757	1.9	1086	38	1065	37	1054	51
DG1 S 106 -3	1	51	41	15	0.80	720	2.574	6.3	0.2251	4.8	0.77	4.4415	4.8	0.0829	4.0	1267	78	1293	46	1309	57
DG1 S 109 4	1	273	189	110	0.69	1908	4.430	5.8	0.2986	5.5	0.95	3.3488	5.5	0.1076	1.7	1759	32	1718	48	1684	82
DG1 S 110 8	1	257	129	103	0.50	26254	4.839	4.4	0.3069	3.9	0.90	3.2586	3.9	0.1143	1.8	1870	33	1792	37	1725	60
DG1 S 111 2	1	52	27	7	0.51	1036	0.882	8.4	0.1042	6.2	0.74	9.6004	6.2	0.0614	5.6	654	119	642	40	639	38
DG1 S 113 2	1	238	142	34	0.60	1227	0.973	6.5	0.1125	6.0	0.91	8.8896	6.0	0.0627	2.6	699	56	690	33	687	39

DG1 S 114	1	119	65	36	0.55	481	3.059	5.1	0.2347	4.5	0.89	4.2601	4.5	0.0945	2.3	1518	43	1422	39	1359	55	10
DG1 S 115	1	216	108	54	0.50	1626	2.252	5.5	0.1969	4.9	0.89	5.0777	4.9	0.0829	2.5	1268	49	1197	39	1159	52	9
DG1 S 117	1	161	37	46	0.23	1389	3.122	5.8	0.2460	5.3	0.91	4.0650	5.3	0.0921	2.4	1468	45	1438	44	1418	67	3
DG1 S 120	1	117	78	44	0.67	1412	4.088	4.8	0.2861	3.6	0.74	3.4954	3.6	0.1036	3.2	1690	59	1652	39	1622	52	4
DG1 S 123	1	246	164	33	0.67	1300	0.908	5.1	0.1048	4.1	0.80	9.5435	4.1	0.0628	3.0	702	65	656	25	642	25	9
DG1 S 126	1	122	78	17	0.64	2832	0.933	7.9	0.1078	5.2	0.65	9.2763	5.2	0.0627	6.0	699	128	669	39	660	32	6
DG1 S 128	1	46	20	11	0.44	5543	2.238	7.0	0.1991	5.0	0.72	5.0231	5.0	0.0815	4.8	1235	94	1193	49	1170	54	5
DG1 S 134	2	95	77	14	0.80	322	0.952	7.7	0.1112	4.1	0.53	8.9928	4.1	0.0621	6.5	677	139	679	38	680	27	0
DG1 S 135	2	112	67	30	0.60	845	2.323	5.3	0.2120	4.1	0.77	4.7162	4.1	0.0795	3.3	1183	66	1219	37	1240	46	-5
DG1 S 137	2	314	210	88	0.67	1382	2.361	3.6	0.2095	3.1	0.86	4.7744	3.1	0.0818	1.8	1240	35	1231	26	1226	35	1
DG1 S 139	2	89	66	12	0.73	543	0.892	7.9	0.1047	4.1	0.51	9.5472	4.1	0.0618	6.8	666	145	647	38	642	25	4
DG1 S 142	2	383	178	91	0.46	14112	2.048	5.2	0.1863	4.8	0.92	5.3677	4.8	0.0797	2.0	1190	39	1132	36	1101	49	7
DG1 S 144	2	123	108	42	0.88	700	3.042	6.0	0.2438	5.6	0.92	4.1013	5.6	0.0905	2.3	1436	44	1418	46	1407	70	2
DG1 S 145	2	179	99	58	0.55	2223	3.160	6.5	0.2525	6.1	0.94	3.9600	6.1	0.0908	2.1	1442	40	1448	50	1451	79	-1
>10% discordant																						
DG1 L 51		77	68	11	0.89	421	0.851	6.5	0.1069	5.1	0.78	9.3513	5.1	0.0577	4.1	519	89	625	30	655	32	-26

DG1 L 15 19	1	47	33	7	0.70	224	1.068	8.7	0.1141	4.3	0.49	8.7635	4.3	0.0679	7.5	865	156	738	45	697	28
DG1 L 17 18	1	127	74	18	0.58	1340	1.029	6.8	0.1118	4.5	0.67	8.9447	4.5	0.0667	5.0	829	104	718	35	683	29
DG1 L 21 -11	1	92	55	13	0.60	201	0.939	7.2	0.1126	5.6	0.78	8.8831	5.6	0.0605	4.5	621	96	672	35	688	37
DG1 L 28 28	1	55	43	18	0.77	415	3.116	7.4	0.2139	3.0	0.40	4.6759	3.0	0.1057	6.8	1726	124	1437	57	1249	34
DG1 L 38 19	1	115	36	40	0.32	1048	4.520	10.1	0.2755	5.5	0.55	3.6303	5.5	0.1190	8.4	1941	150	1735	84	1568	77
DG1 S 47 20	1	934	7	266	0.01	11087	3.208	5.8	0.2278	5.7	0.98	4.3892	5.7	0.1021	1.2	1663	22	1459	45	1323	68
DG1 S 48 -12	1	52	29	6	0.56	118	0.800	11.8	0.0994	9.5	0.80	10.0610	9.5	0.0584	7.1	545	155	597	53	611	55
DG1 S 49 13	1	263	65	58	0.25	953	2.125	6.9	0.1861	6.2	0.89	5.3734	6.2	0.0828	3.1	1265	61	1157	48	1100	63
DG1 S 51 63	1	98	86	17	0.88	201	1.665	9.3	0.1097	5.7	0.61	9.1170	5.7	0.1101	7.3	1801	133	995	59	671	36
DG1 S 54 29	1	751	132	171	0.18	1707	2.255	5.5	0.1767	4.8	0.87	5.6594	4.8	0.0926	2.7	1479	51	1198	39	1049	47
DG1 S 58 12	1	61	48	8	0.80	186	0.897	7.6	0.1028	3.8	0.50	9.7273	3.8	0.0633	6.5	717	139	650	36	631	23
DG1 S 64 14	1	162	127	53	0.79	23841	3.101	4.7	0.2316	3.7	0.79	4.3171	3.7	0.0971	2.8	1569	53	1433	36	1343	45
DG1 S 66 12	1	352	137	79	0.39	1983	1.972	6.3	0.1781	4.7	0.74	5.6135	4.7	0.0803	4.1	1204	82	1106	42	1057	46
DG1 S 69 12	1	57	33	8	0.58	614	0.948	8.8	0.1073	6.2	0.70	9.3221	6.2	0.0641	6.2	745	132	677	43	657	39
DG1 S 71 13	1	60	47	14	0.78	668	1.972	10.0	0.1778	7.4	0.73	5.6228	7.4	0.0804	6.8	1207	134	1106	68	1055	72
DG1 S 74 25	1	628	547	91	0.87	6230	0.974	5.5	0.1044	4.6	0.83	9.5828	4.6	0.0677	3.0	858	63	690	27	640	28

DG1 S 90	1	244	140	74	0.58	1982	2.952	4.5	0.2294	4.0	0.88	4.3594	4.0	0.0933	2.1	1494	40	1395	34	1331	48	11
DG1 S 92	1	222	165	30	0.74	320	0.939	5.7	0.1027	4.3	0.76	9.7412	4.3	0.0663	3.7	816	77	672	28	630	26	23
DG1 S 104	1	332	77	69	0.23	2494	2.015	7.9	0.1760	6.2	0.79	5.6808	6.2	0.0830	4.8	1270	94	1121	53	1045	60	18
DG1 S 105	1	65	52	9	0.79	365	0.919	10.2	0.1109	6.2	0.60	9.0204	6.2	0.0601	8.1	607	175	662	49	678	40	-12
DG1 S 107	1	92	55	13	0.59	193	1.034	8.3	0.1134	6.1	0.73	8.8170	6.1	0.0661	5.6	811	118	721	43	693	40	15
DG1 S 108	1	300	256	77	0.85	2607	2.161	7.2	0.1828	5.5	0.76	5.4704	5.5	0.0857	4.7	1332	91	1168	50	1082	55	19
DG1 S 112	1	207	202	30	0.97	595	0.909	6.3	0.1042	5.5	0.87	9.5974	5.5	0.0633	3.1	717	65	657	30	639	33	11
DG1 S 116	1	118	52	16	0.44	389	1.069	9.2	0.1047	5.3	0.57	9.5515	5.3	0.0741	7.5	1043	152	738	48	642	32	38
DG1 S 118	1	377	327	57	0.87	1348	1.037	6.0	0.1069	5.0	0.83	9.3532	5.0	0.0703	3.3	938	68	722	31	655	31	30
DG1 S 119	1	381	376	65	0.99	285	1.518	6.2	0.1127	3.3	0.53	8.8753	3.3	0.0977	5.2	1581	97	938	38	688	22	56
DG1 S 121	1	130	37	38	0.29	2469	3.265	5.3	0.2399	3.2	0.59	4.1681	3.2	0.0987	4.2	1600	79	1473	41	1386	39	13
DG1 S 122	1	445	282	100	0.64	3268	1.861	4.4	0.1712	3.9	0.87	5.8400	3.9	0.0788	2.1	1168	42	1068	29	1019	36	13
DG1 S 124	1	51	38	7	0.74	494	0.940	7.3	0.1042	3.5	0.47	9.5945	3.5	0.0654	6.4	787	135	673	36	639	21	19
DG1 S 125	1	88	55	12	0.62	169	0.961	7.7	0.1080	4.0	0.52	9.2557	4.0	0.0645	6.5	758	137	684	38	661	25	13
DG1 S 127	1	429	248	68	0.58	310	1.447	16.3	0.1104	7.4	0.45	9.0615	7.4	0.0951	14.5	1530	274	909	98	675	47	56
DG1 S 129	1	59	36	8	0.62	94	0.906	8.8	0.1104	5.9	0.67	9.0601	5.9	0.0595	6.5	587	142	655	43	675	38	-15

DG1 S 130	1	185	109	25	0.59	385	0.920	6.5	0.1052	5.1	0.79	9.5076	5.1	0.0634	4.0	722	84	662	31	645	31	11
DG1 S 131	2	133	95	18	0.71	5827	0.933	7.1	0.1053	5.5	0.77	9.4966	5.5	0.0643	4.5	751	95	669	35	645	34	14
DG1 S 132	2	151	121	22	0.80	492	1.044	5.8	0.1063	3.5	0.60	9.4042	3.5	0.0712	4.6	964	94	726	30	651	22	32
DG1 S 133	2	104	82	16	0.79	1374	1.131	12.5	0.1090	5.6	0.45	9.1783	5.6	0.0753	11.2	1077	225	768	68	667	36	38
DG1 S 136	2	92	63	13	0.69	527	0.879	8.4	0.1077	3.2	0.38	9.2829	3.2	0.0592	7.8	573	169	640	40	660	20	-15
DG1 S 138	2	309	270	45	0.87	3012	1.030	7.1	0.1009	2.9	0.41	9.9152	2.9	0.0741	6.5	1043	131	719	37	619	17	41
DG1 S 140	2	151	117	23	0.78	2287	1.184	8.7	0.1071	4.1	0.47	9.3336	4.1	0.0802	7.7	1201	151	793	48	656	26	45
DG1 S 141	2	110	72	15	0.65	536	0.851	6.7	0.1061	3.8	0.56	9.4221	3.8	0.0582	5.5	536	121	625	31	650	24	-21
DG1 S 148	2	45	25	6	0.56	928	1.117	9.1	0.1090	5.4	0.59	9.1750	5.4	0.0743	7.3	1050	147	762	49	667	34	37

Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	$^{206}Pb/^{204}Pb$	$^{207}Pb/^{235}U$	±2s (%)	$^{206}Pb/^{238}U$	±2s (%)	error corr.	$^{238}U/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$	±2s (%)	$^{207}Pb/^{206}Pb$ (abs)	±2s	$^{207}Pb/^{235}U$ (abs)	±2s	$^{206}Pb/^{238}U$ (abs)	±2s	% disc.

Scout 2
<10% discordant

Scout2 S 336	1	204	126	28	0.62	6891	0.957	8.0	0.1119	5.2	0.64	8.9373	5.2	0.0620	6.0	674	129	682	39	684	34	-1
Scout2 S 337	1	136	90	20	0.66	605	1.052	10.8	0.1185	8.0	0.73	8.4366	8.0	0.0643	7.3	753	154	730	56	722	54	4
Scout2 S 338	1	441	423	70	0.96	5254	0.988	9.1	0.1140	7.4	0.81	8.7697	7.4	0.0628	5.2	702	112	698	46	696	49	1

Scout2 S 342	1	150	79	22	0.53	63163	1.027	9.1	0.1195	6.0	0.65	8.3648	6.0	0.0623	6.9	684	147	717	47	728	41	-6
Scout2 S 351	1	582	354	86	0.61	9371	0.976	9.4	0.1132	8.6	0.91	8.8361	8.6	0.0626	3.8	694	81	692	47	691	57	0
Scout2 S 352	1	164	46	20	0.28	655	0.929	8.4	0.1091	5.5	0.65	9.1621	5.5	0.0617	6.3	665	134	667	41	668	35	0
Scout2 S 357	1	164	77	22	0.47	2153	0.984	7.5	0.1125	5.9	0.78	8.8902	5.9	0.0635	4.6	724	98	696	38	687	38	5
Scout2 S 359	1	217	163	32	0.75	1200	0.973	9.4	0.1116	6.6	0.70	8.9568	6.6	0.0632	6.6	716	141	690	47	682	43	5
Scout2 S 363	2	138	88	19	0.63	557	0.932	8.3	0.1069	4.7	0.55	9.3506	4.7	0.0632	6.9	714	147	668	41	655	29	8
Scout2 S 365	2	153	77	19	0.50	2262	0.859	6.1	0.1046	4.0	0.63	9.5644	4.0	0.0596	4.7	589	101	630	29	641	24	-9
Scout2 S 375	2	232	102	29	0.44	966	0.900	7.0	0.1037	5.2	0.74	9.6389	5.2	0.0629	4.6	706	99	652	34	636	32	10
Scout 2 L 1	3	134	77	17	0.57	759	0.892	5.9	0.1060	4.7	0.78	9.4337	4.7	0.0610	3.6	641	78	647	28	649	29	-1
Scout 2 L 2	3	161	83	21	0.51	292	0.917	6.6	0.1052	4.5	0.67	9.5099	4.5	0.0632	4.8	715	103	661	32	645	28	10
>10% discordant																						
Scout2 S 334	1	703	259	92	0.37	1423	1.016	5.4	0.1017	4.6	0.83	9.8341	4.6	0.0725	2.9	999	59	712	28	624	27	37
Scout2 S 335	1	367	250	55	0.68	3159	1.077	8.1	0.1174	6.4	0.78	8.5205	6.4	0.0666	5.0	824	104	742	43	715	43	13
Scout2 S 344	1	236	143	31	0.61	476	0.935	8.2	0.1054	5.8	0.70	9.4878	5.8	0.0644	5.8	753	122	670	40	646	36	14
Scout2 S 346	1	556	423	95	0.76	775	1.124	16.0	0.1158	9.6	0.60	8.6350	9.6	0.0704	12.8	940	262	765	86	706	64	25
Scout2 S 347	1	1474	739	203	0.50	1772	0.836	7.8	0.0878	5.5	0.70	11.3923	5.5	0.0691	5.5	902	114	617	36	542	29	40

Scout2 S 349 13	1	1078	517	146	0.48	18434	0.822	7.3	0.0959	6.4	0.86	10.4271	6.4	0.0621	3.6	678	77	609	33	590	36
Scout2 S 350 32	1	1003	503	138	0.50	2091	0.940	7.3	0.0988	6.7	0.91	10.1177	6.7	0.0690	2.9	898	59	673	36	608	39
Scout2 S 354 14	1	438	390	67	0.89	4246	0.966	6.6	0.1082	5.2	0.77	9.2449	5.2	0.0648	4.1	766	86	686	33	662	32
Scout2 S 356 24	1	278	215	41	0.77	1226	1.041	12.4	0.1099	9.9	0.79	9.0990	9.9	0.0687	7.5	890	155	724	64	672	63
Scout2 S 358 13	1	138	64	18	0.46	270	1.007	8.4	0.1118	6.8	0.81	8.9439	6.8	0.0653	4.9	785	103	707	43	683	44
Scout2 S 361 11	1	143	88	20	0.61	811	1.031	8.3	0.1146	5.9	0.71	8.7272	5.9	0.0653	5.8	783	122	720	43	699	39
Scout2 S 364 18	2	175	131	24	0.75	8566	0.937	8.4	0.1044	5.4	0.63	9.5807	5.4	0.0651	6.5	777	137	671	41	640	33
Scout2 S 367 24	2	150	79	19	0.52	271	0.941	7.4	0.1023	3.1	0.41	9.7708	3.1	0.0667	6.7	827	140	673	36	628	19
Scout2 S 368 14	2	173	87	21	0.50	337	0.901	6.9	0.1024	4.6	0.65	9.7645	4.6	0.0638	5.2	734	109	652	33	629	27
Scout2 S 370 28	2	147	116	22	0.79	362	1.073	10.8	0.1105	6.7	0.62	9.0482	6.7	0.0704	8.4	940	173	740	57	676	43
Scout2 S 372 38	2	1337	605	179	0.45	3290	0.874	7.7	0.0913	5.9	0.75	10.9587	5.9	0.0695	5.0	912	103	638	37	563	32
Scout2 S 373 42	2	2229	936	267	0.42	3476	0.673	6.6	0.0743	6.2	0.93	13.4662	6.2	0.0658	2.3	799	48	523	27	462	28
Scout2 S 376 12	2	151	68	19	0.45	556	0.923	7.9	0.1053	5.2	0.65	9.4995	5.2	0.0636	6.0	729	127	664	39	645	32
Scout2 S 378 28	2	141	64	18	0.46	254	0.966	8.4	0.1025	6.4	0.76	9.7546	6.4	0.0683	5.4	878	112	686	42	629	38
Scout 2 L 3 22	3	161	108	21	0.67	509	0.910	6.6	0.1007	5.0	0.74	9.9305	5.0	0.0656	4.4	792	92	657	32	619	29
Scout 2 L 4 20	3	140	68	17	0.48	559	0.920	6.1	0.1023	4.3	0.70	9.7782	4.3	0.0652	4.3	781	91	662	30	628	26

Analysis	notes	U ppm	Th ppm	Pb ppm	Th/U	^{206}Pb/^{204}Pb	^{207}Pb/^{235}U	±2s (%)	^{206}Pb/^{238}U	±2s (%)	error corr.	^{238}U/^{206}Pb	±2s (%)	^{207}Pb/^{206}Pb	±2s (%)	^{207}Pb/^{206}Pb (abs)	±2s	^{207}Pb/^{235}U (abs)	±2s	^{206}Pb/^{238}U (abs)	±2s	% disc.
Scout 2 L 5	3	1084	1389	162	1.28	23620	0.760	4.6	0.0867	4.0	0.84	11.5283	4.0	0.0635	2.4	726	51	574	20	536	20	26
Scout 3																						
<10% discordant																						
Scout3 S 380	1	115	61	17	0.53	3170	1.125	11.1	0.1268	9.0	0.81	7.8839	9.0	0.0643	6.5	753	137	765	60	770	66	-2
Scout3 S 383	1	164	95	22	0.58	246	0.945	7.3	0.1119	5.4	0.73	8.9393	5.4	0.0612	4.9	648	105	675	36	684	35	-6
Scout3 S 384	1	154	94	21	0.61	2458	0.933	9.0	0.1107	6.1	0.67	9.0366	6.1	0.0611	6.6	643	142	669	44	677	39	-5
Scout3 S 387	1	107	77	16	0.71	239	1.046	11.2	0.1160	7.9	0.70	8.6236	7.9	0.0654	7.9	787	167	727	58	707	53	10
Scout3 S 388	1	122	70	17	0.57	705	1.023	12.4	0.1144	9.8	0.78	8.7433	9.8	0.0648	7.7	769	162	715	64	698	65	9
Scout3 S 389	1	142	80	19	0.56	2124	0.951	7.9	0.1084	5.3	0.66	9.2239	5.3	0.0636	5.9	729	125	679	39	664	33	9
Scout3 S 390	1	199	93	27	0.47	2632	0.999	8.2	0.1161	6.5	0.78	8.6113	6.5	0.0624	5.0	688	107	703	42	708	43	-3
Scout3 S 391	1	120	58	16	0.49	572	1.005	11.2	0.1139	8.6	0.76	8.7807	8.6	0.0640	7.2	742	153	706	57	695	57	6
Scout3 S 392	1	172	93	23	0.54	341	0.937	8.0	0.1110	6.7	0.83	9.0068	6.7	0.0612	4.3	646	93	671	39	679	43	-5
Scout3 S 394	1	181	96	25	0.53	827	0.994	7.5	0.1141	6.1	0.81	8.7650	6.1	0.0632	4.3	715	91	701	38	696	40	3
Scout3 S 396	1	183	113	25	0.62	3425	0.945	9.2	0.1085	6.8	0.74	9.2203	6.8	0.0632	6.2	716	131	676	45	664	43	7

Scout3 S 397 14	149	80	19	0.54	428	0.884	8.4	0.1040	5.7	0.67	9.6166	5.7	0.0617	6.1	662	132	643	40	638	35
Scout3 S 398 1-3	123	75	17	0.60	1048	0.931	7.3	0.1099	4.7	0.63	9.1018	4.7	0.0615	5.6	655	119	668	36	672	30
Scout3 S 400 11	127	62	17	0.49	783	0.998	7.1	0.1150	5.5	0.77	8.6946	5.5	0.0630	4.5	707	95	703	36	702	37
Scout3 S 402 1-3	110	56	15	0.50	647	0.965	9.0	0.1132	6.2	0.68	8.8358	6.2	0.0618	6.6	669	141	686	45	691	41
Scout3 S 405 11	135	66	17	0.49	3505	0.928	8.9	0.1085	6.5	0.73	9.2125	6.5	0.0620	6.0	674	128	667	43	664	41
Scout3 S 406 1-7	206	115	29	0.56	7898	0.986	8.5	0.1161	6.3	0.73	8.6098	6.3	0.0616	5.7	659	122	697	43	708	42
Scout3 S 414 1-5	54	34	8	0.63	60	1.030	11.6	0.1194	6.5	0.55	8.3765	6.5	0.0626	9.6	694	205	719	60	727	44
Scout3 S 415 18	137	56	17	0.41	4869	0.892	7.1	0.1035	4.7	0.65	9.6614	4.7	0.0625	5.3	692	113	648	34	635	28
Scout3 S 422 29	175	95	22	0.54	1313	0.860	6.9	0.1004	4.5	0.64	9.9593	4.5	0.0621	5.2	678	111	630	32	617	26
Scout3 S 442 26	327	239	47	0.73	2121	0.956	10.6	0.1098	8.9	0.83	9.1045	8.9	0.0631	5.8	712	123	681	53	672	57
Scout3 S 445 25	117	69	18	0.59	119	1.138	14.0	0.1254	8.1	0.57	7.9718	8.1	0.0658	11.5	800	240	772	76	762	58
Scout 3 L 16 3-2	160	121	23	0.76	543	0.929	8.0	0.1095	5.8	0.71	9.1334	5.8	0.0615	5.6	657	120	667	39	670	37
Scout 3 L 20 37	84	39	11	0.47	283	0.964	8.0	0.1100	5.7	0.71	9.0928	5.7	0.0635	5.6	727	118	685	40	673	36
Scout 3 L 21 30	93	53	12	0.57	260	0.926	6.2	0.1089	4.0	0.63	9.1843	4.0	0.0617	4.8	663	103	666	30	666	25
Scout 3 L 22 37	169	109	22	0.65	765	0.879	5.2	0.1026	3.2	0.59	9.7483	3.2	0.0622	4.1	680	89	641	25	630	19
Scout 3 L 23 37	166	93	21	0.56	1423	0.865	6.0	0.1013	3.7	0.62	9.8693	3.7	0.0619	4.6	670	99	633	28	622	22

Scout 3 L 26	3	259	167	33	0.65	460	0.882	6.6	0.1021	5.3	0.79	9.7973	5.3	0.0627	4.0	698	85	642	32	627	32	10
Scout 3 L 31	3	393	152	50	0.39	763	0.913	5.5	0.1049	4.7	0.84	9.5329	4.7	0.0631	2.9	712	62	659	27	643	29	10
Scout 3 L 37	3	141	77	19	0.55	357	0.929	6.0	0.1061	4.4	0.72	9.4257	4.4	0.0635	4.1	726	88	667	29	650	27	10
Scout 3 L 38	3	155	72	20	0.47	2179	0.909	7.1	0.1071	5.7	0.81	9.3366	5.7	0.0616	4.1	660	89	657	34	656	36	1
Scout 3 L 39	3	238	149	32	0.63	2372	0.905	7.0	0.1043	4.7	0.67	9.5855	4.7	0.0629	5.1	707	109	655	34	640	29	9
>10% discordant																						
Scout3 S 381	1	125	78	18	0.62	4809	0.976	7.3	0.1201	4.6	0.62	8.3270	4.6	0.0590	5.6	566	123	692	36	731	32	-29
Scout3 S 386	1	223	179	31	0.80	314	0.951	7.7	0.1073	6.2	0.80	9.3209	6.2	0.0643	4.6	751	97	679	38	657	39	12
Scout3 S 393	1	126	63	17	0.50	703	1.042	8.0	0.1140	6.5	0.81	8.7711	6.5	0.0663	4.6	816	97	725	42	696	43	15
Scout3 S 395	1	120	57	17	0.48	2009	1.006	8.8	0.1228	7.2	0.81	8.1448	7.2	0.0595	5.1	584	111	707	45	747	51	-28
Scout3 S 403	1	134	62	18	0.46	590	0.983	9.1	0.1098	5.9	0.64	9.1057	5.9	0.0649	6.9	771	146	695	46	672	37	13
Scout3 S 404	1	147	77	20	0.52	708	1.025	7.9	0.1094	6.2	0.78	9.1397	6.2	0.0679	4.9	866	101	716	40	669	39	23
Scout3 S 408	1	147	83	20	0.57	149	0.886	8.4	0.1081	6.2	0.73	9.2545	6.2	0.0594	5.7	584	124	644	40	661	39	-13
Scout3 S 409	1	188	85	23	0.45	1891	0.924	8.2	0.1006	5.8	0.69	9.9386	5.8	0.0666	5.9	826	123	665	40	618	34	25
Scout3 S 410	1	114	56	16	0.49	3229	1.035	9.4	0.1143	7.5	0.79	8.7463	7.5	0.0656	5.6	795	118	721	48	698	50	12
Scout3 S 411	1	215	143	29	0.66	4020	0.971	8.5	0.1073	6.3	0.73	9.3174	6.3	0.0656	5.7	793	120	689	43	657	39	17

Scout3 S 412 1	1179	598	148	0.51	18887	0.782	8.8	0.0861	8.5	0.96	11.6122	8.5	0.0658	2.2	801	47	586	39	533	44	34
Scout3 S 413 1	192	158	27	0.82	4652	0.933	6.5	0.1043	5.5	0.83	9.5896	5.5	0.0649	3.5	772	74	669	32	639	34	17
Scout3 S 416 1	225	141	28	0.63	756	0.903	5.9	0.0986	4.3	0.71	10.1432	4.3	0.0664	4.0	820	84	653	28	606	25	26
Scout3 S 418 1	207	125	29	0.60	147620	1.066	5.5	0.1158	4.9	0.86	8.6375	4.9	0.0668	2.6	830	55	737	29	706	33	15
Scout3 S 419 2	620	281	80	0.45	2510	0.866	6.7	0.0995	6.1	0.89	10.0520	6.1	0.0632	2.9	714	62	634	32	611	35	14
Scout3 S 420 2	137	78	18	0.57	264	0.969	8.8	0.1056	6.1	0.68	9.4691	6.1	0.0666	6.4	825	133	688	44	647	37	22
Scout3 S 421 2	200	126	26	0.63	643	0.898	6.3	0.1017	4.4	0.69	9.8332	4.4	0.0641	4.4	744	94	651	30	624	26	16
Scout3 S 423 2	198	136	27	0.69	609	0.908	7.7	0.1017	6.5	0.83	9.8313	6.5	0.0648	4.2	767	88	656	37	624	38	19
Scout3 S 424 2	147	85	19	0.58	3592	0.966	9.1	0.1059	7.3	0.80	9.4464	7.3	0.0662	5.3	813	112	687	45	649	45	20
Scout3 S 425 2	174	96	22	0.55	4417	0.915	6.9	0.1029	4.4	0.63	9.7208	4.4	0.0645	5.3	758	112	660	34	631	27	17
Scout3 S 426 2	153	95	20	0.62	723	0.928	6.9	0.1043	4.5	0.64	9.5853	4.5	0.0645	5.2	758	111	666	34	640	27	16
Scout3 S 427 2	169	93	23	0.55	361	0.966	6.6	0.1075	5.1	0.76	9.3021	5.1	0.0652	4.2	780	89	686	33	658	32	16
Scout3 S 428 2	174	88	21	0.50	9021	0.848	7.6	0.0987	4.3	0.56	10.1305	4.3	0.0623	6.2	684	133	623	35	607	25	11
Scout3 S 432 2	172	104	22	0.61	1222	0.909	6.9	0.1016	4.8	0.69	9.8465	4.8	0.0649	4.9	771	104	656	33	624	29	19
Scout3 S 433 2	339	228	44	0.67	277	0.875	6.1	0.0989	3.9	0.62	10.1078	3.9	0.0641	4.7	745	100	638	29	608	23	18
Scout3 S 435 2	96	43	12	0.45	283	1.056	8.4	0.1055	5.8	0.69	9.4811	5.8	0.0726	6.0	1004	122	732	44	646	36	36

Scout3 S 436	2	138	69	18	0.50	761	0.948	8.1	0.1068	5.4	0.66	9.3675	5.4	0.0644	6.0	755	128	677	40	654	34	13
Scout3 S 437	2	204	157	29	0.77	614	1.024	7.5	0.1095	5.7	0.75	9.1358	5.7	0.0678	4.9	863	102	716	39	670	36	22
Scout3 S 438	2	110	56	14	0.51	3420	0.960	8.2	0.1056	4.6	0.56	9.4724	4.6	0.0659	6.7	804	141	683	41	647	29	20
Scout3 S 439	2	141	59	16	0.42	626	0.929	8.9	0.0977	5.2	0.57	10.2324	5.2	0.0690	7.3	898	150	667	44	601	30	33
Scout3 S 443	2	183	106	26	0.58	462	1.042	8.9	0.1153	6.4	0.72	8.6722	6.4	0.0655	6.1	791	128	725	46	704	43	11
Scout 3 L 14	3	168	100	21	0.59	1013	0.939	7.3	0.1013	5.3	0.72	9.8731	5.3	0.0672	5.0	844	104	672	36	622	32	26
Scout 3 L 15	3	182	93	23	0.51	712	0.918	6.1	0.1027	4.8	0.78	9.7350	4.8	0.0648	3.8	769	80	661	30	630	29	18
Scout 3 L 17	3	143	80	18	0.56	329	0.927	6.2	0.1024	5.2	0.83	9.7654	5.2	0.0657	3.5	796	72	666	30	628	31	21
Scout 3 L 18	3	565	464	79	0.82	1429	0.848	7.6	0.0983	6.6	0.87	10.1695	6.6	0.0625	3.7	693	80	624	35	605	38	13
Scout 3 L 19	3	35	13	4	0.37	248	0.895	9.1	0.1124	5.4	0.59	8.9005	5.4	0.0578	7.3	522	161	649	44	686	35	-31
Scout 3 L 24	3	1200	559	144	0.47	14351	0.761	4.9	0.0867	4.6	0.92	11.5360	4.6	0.0636	1.8	729	39	574	22	536	23	27
Scout 3 L 25	3	459	375	62	0.82	791	0.871	5.7	0.0997	4.9	0.86	10.0330	4.9	0.0633	2.8	720	60	636	27	612	29	15
Scout 3 L 27	3	79	41	11	0.52	2959	1.157	9.8	0.1152	5.6	0.57	8.6771	5.6	0.0728	8.0	1008	162	780	53	703	37	30
Scout 3 L 29	3	258	128	31	0.50	322	0.864	5.9	0.1001	4.9	0.83	9.9867	4.9	0.0626	3.2	694	69	632	28	615	29	11
Scout 3 L 30	3	912	674	124	0.74	6960	0.822	5.3	0.0941	4.7	0.89	10.6308	4.7	0.0634	2.2	721	48	609	24	580	26	20
Scout 3 L 32	3	153	110	21	0.72	315	1.057	5.8	0.1048	4.0	0.68	9.5418	4.0	0.0731	4.2	1017	86	732	30	642	25	37

Scout 3 L 33 16	3	252	209	35	0.83	751	0.914	5.8	0.1030	4.6	0.78	9.7082	4.6	0.0643	3.5	753	74	659	28	632	28
Scout 3 L 34 17	3	132	64	17	0.49	1588	0.933	6.2	0.1045	4.4	0.70	9.5736	4.4	0.0648	4.4	767	92	669	30	640	27
Scout 3 L 35 17	3	174	94	22	0.54	1285	0.906	5.9	0.1019	4.8	0.80	9.8128	4.8	0.0645	3.5	758	74	655	28	626	28
Scout 3 L 36 17	3	87	48	11	0.55	243	0.972	6.9	0.1075	5.1	0.73	9.2997	5.1	0.0655	4.7	792	98	689	35	658	32

APPENDIX 4B:

BSU LA-ICPMS notes

Isotope ratios and ages are reported without initial common Pb correction; gas blank-corrected mass 204 signals were generally irresolvable from zero.

Trace element concentrations in ppm, calculated using the mean count rate method, internal standardization to 29Si, and calibration to NIST 610 and 612 glass standards.

Ablation using a 213 nm wavelength laser, spot size of 25 microns, repetition rate of 10 Hz, and fluence of ~5 J/cm2.

Trace element concentrations were deleted from analyses known to have intersected inclusions of other minerals based on P and Ti.

01DS-05

1

Experiment 6 01Jan15

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 064% (207Pb/206Pb), 2.48% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 7 01Jan15

Notes:

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 1.36% (207Pb/206Pb), 3.53% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2KE085A

1

Experiment 2 19June15

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.49% (207Pb/206Pb), 1.24% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

3KE043

1

Experiment 2 19June15

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.49% (207Pb/206Pb), 1.24% (206Pb/238U) (all 1-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

3KE044

1

Experiment 3 19June15

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 1.08% (207Pb/206Pb), 1.57% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

09RL762

1

Experiment 1 20June16

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.79% (207Pb/206Pb), 1.83% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 2 20June16

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.66% (207Pb/206Pb), 1.65% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

15VI003

1

Experiment 4 11Dec15

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.50% (207Pb/206Pb), 1.17% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 5 11Dec15

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.44% (207Pb/206Pb), 1.54% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

DG-1

1

Experiment 1 19June15

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.51% (207Pb/206Pb),1.17% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 2 19June15

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of0.49% (207Pb/206Pb), 1.24% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

Scout 2

1

Experiment 3 30July13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.89% (207Pb/206Pb), 2.34% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 4 30July13

Notes:

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.86% (207Pb/206Pb), 3.79% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

3

Experiment 1 20August13

Notes:

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.69% (207Pb/206Pb), 1.79% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

Scout 3

1

Experiment 3 30July13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.88% (207Pb/206Pb), 2.34% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

2

Experiment 4 30July13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.85% (207Pb/206Pb), 3.78% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

3

Experiment 1 20August13

Isotope ratios and ages are NOT corrected for initial common Pb.

Isotope ratio and apparent age errors do NOT include systematic calibration errors of 0.68% (207Pb/206Pb), 1.79% (206Pb/238U) (all 2-sigma).

Isotope ratios and ages corrected using a measured linear secondary standard age bias - 206Pb count rate relationship.

APPENDIX 4C:

BSU zircon LA-ICPMS concentrations

Analysis	P	Ti	Y	Nb	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	Th	U
01D-05																						
<10% discordant																						
01DS-05 L 619	40	0.1	1085	40.13		47.15	0.02	2.09	12.83	4.26	66.7	22.26	239.43	68.07	216.2	40.7	288	26.5	5708	8.07	50.3	203.5
01DS-05 L 622	20		396	8.92		8.99		0.34	1.89	0.69	13.6	6.08	70.60	23.41	84.3	17.3	128	13.3	6264	4.12	6.8	77.6
01DS-05 L 626																						
01DS-05 L 639	31	1.2	2870	52.38	0.13	95.93	0.14	4.58	20.68	6.35	107.0	34.16	351.32	87.77	283.0	50.6	385	35.5	5294	7.66	133.3	266.3
01DS-05 L 644	85	1.2	2491	80.76		86.01	0.06	4.55	21.94	7.23	131.4	46.03	539.40	157.31	571.5	104.4	710	71.0	6553	15.83	105.8	370.5
01DS-05 L 657	35	0.2	368	9.05	0.15	10.88	0.07	0.92	2.95	0.70	13.6	5.35	67.84	25.23	96.7	18.9	136	16.5	7000	3.22	19.0	105.0
01DS-05 L 698																						
>10% discordant																						
01DS-05 L 611	39	7.5	2514	41.35	6.32	80.20	2.16	17.98	31.36	10.69	160.1	51.08	550.15	164.96	575.0	115.3	851	81.4	5346	5.54	54.6	243.6
01DS-05 L 613	78	1.6	8722	177.17	0.15	239.00	0.24	9.32	50.31	16.16	275.2	87.90	885.65	242.84	749.6	123.6	862	82.1	5489	28.74	434.6	923.0
01DS-05 L 615	106	2.5	13648	146.97		258.95	0.44	13.23	64.38	22.54	326.0	117.52	1286.46	401.32	1452.7	282.7	2053	192.5	4870	12.63	338.1	774.1
01DS-05 L 616	236	4.4	16566	272.36		429.79	0.66	22.08	117.94	39.02	562.4	186.40	1856.93	503.06	1576.3	273.8	1819	156.6	4988	25.84	609.3	1152.3

01DS-05 L 618	52	6.0	1492	56.07	0.92	84.48	0.38	4.55	17.45	6.71	90.3	29.03	306.21	85.98	292.3	54.4	377	37.0	5747	8.73	117.1	267.5
01DS-05 L 620	115	2.8	9094	174.33		236.90	0.28	10.06	51.35	17.94	274.9	92.97	980.46	286.41	956.0	175.1	1218	107.6	5328	23.86	309.1	768.4
01DS-05 L 623																						
01DS-05 L 624																						
01DS-05 L 625																						
01DS-05 L 627																						
01DS-05 L 628	22	0.4	1761	24.97	0.32	53.14	0.28	5.95	19.33	7.46	112.3	36.09	377.43	104.66	349.1	64.8	465	43.8	5186	5.43	54.0	219.5
01DS-05 L 629																						
01DS-05 L 630																						
01DS-05 L 631																						
01DS-05 L 632																						
01DS-05 L 633	58	1.6	11537	42.72	0.00	126.87	0.77	20.56	68.61	22.21	323.6	110.74	1145.75	338.59	1171.6	217.6	1551	144.2	4636	6.39	137.3	478.5
01DS-05 L 634	51	0.3	3324	29.03		78.28	0.58	14.32	44.83	14.63	227.1	75.62	798.37	238.22	811.1	153.2	1089	100.2	4848	4.93	87.0	343.3
01DS-05 L 635	114	3.6	13112	198.15	0.16	304.64	0.63	18.93	91.96	30.01	444.0	140.46	1334.58	368.46	1234.6	214.0	1412	126.7	4916	22.01	283.1	826.9
01DS-05 L 636	118	3.0	10910	179.77		250.43	0.23	16.16	68.44	22.37	357.2	111.82	1092.27	307.80	1002.7	178.8	1212	111.7	5285	23.13	239.7	749.8
01DS-05 L 637	88	2.6	13377	86.94	0.63	179.14	1.03	29.07	86.48	28.18	401.7	123.19	1289.15	376.08	1340.1	246.7	1769	171.4	5043	11.61	196.9	594.7

01DS-05 L 638																						
01DS-05 L 640	52	3.3	11905	48.48	3.72	120.24	1.97	26.68	76.53	22.66	348.4	110.45	1121.49	313.39	1038.1	182.4	1262	125.4	5826	7.23	144.1	447.5
01DS-05 L 641	67	2.1	12334	46.37	0.65	114.36	0.97	21.94	65.05	23.99	345.4	109.63	1127.11	316.28	1030.8	179.6	1260	125.1	5789	8.41	142.4	443.8
01DS-05 L 642	126	1.8	14980	91.32		176.43	0.84	22.55	79.93	26.09	404.6	140.98	1573.66	451.37	1552.7	273.2	1740	162.3	4741	13.37	338.7	645.0
01DS-05 L 643	120	1.4	15308	83.21	0.03	166.89	0.97	25.51	82.60	28.74	401.8	147.71	1586.70	461.41	1599.9	279.4	1842	168.8	4971	11.60	327.6	655.6
01DS-05 L 645	109	4.0	20580	167.04		403.87	1.19	29.41	111.43	37.92	571.7	180.54	1879.34	566.38	1994.9	367.0	2478	260.9	5253	15.02	410.6	974.9
01DS-05 L 646																						
01DS-05 L 647	100	2.9	10610	109.25	1.90	174.38	0.74	15.30	60.26	20.04	303.1	100.00	1101.78	314.78	1087.3	198.0	1311	130.1	5221	15.75	196.4	603.4
01DS-05 L 648	121	2.2	8776	80.34	0.10	92.39	0.47	9.99	33.83	11.41	192.9	64.70	698.06	212.45	732.6	134.4	982	118.5	5369	11.23	393.7	528.9
01DS-05 L 649	142	2.6	11002	191.39		262.10	0.28	12.14	55.11	20.74	343.9	112.21	1155.17	328.13	1101.7	189.9	1273	120.2	5649	24.97	379.7	838.9
01DS-05 L 652																						
01DS-05 L 653																						
01DS-05 L 655	45	0.9	1880	17.75	0.11	29.86	0.22	3.21	14.66	5.73	98.0	44.51	461.02	121.28	335.0	44.8	256	25.5	5208	4.69	100.2	263.1
01DS-05 L 656	141	6.2	18906	239.57	0.11	478.16	1.26	34.04	130.31	38.74	632.7	180.57	1744.19	487.92	1636.5	283.4	1812	193.8	6099	29.17	624.4	1013.9
01DS-05 L 658																						
01DS-05 L 660	96	0.5	14134	43.16	0.25	112.00	1.11	24.11	72.86	23.33	380.6	121.68	1237.34	375.27	1302.3	229.7	1523	179.1	6569	6.87	135.6	420.2

01DS-05 L 662	73	1.0	18918	33.76	0.41	153.54	2.23	49.43	123.13	38.34	589.2	178.48	1780.17	513.55	1738.3	296.0	1981	227.6	9796	3.41	128.5	333.2
01DS-05 L 663																						
01DS-05 L 664	26	43.7	1417	203.55	28.81	54.73	7.13	35.79	8.56	1.09	28.2	18.62	281.90	98.91	411.8	72.1	430	45.1	13476	98.68	65.3	171.5
01DS-05 L 665	117	1.8	19721	58.15	0.02	205.10	1.65	43.53	121.26	37.29	562.8	175.51	1782.60	524.01	1811.7	316.0	2111	234.4	6358	8.47	231.3	601.2
01DS-05 L 666	86	2.3	13597	86.20		229.25	0.67	16.62	65.45	23.39	347.0	118.66	1191.20	351.15	1248.4	238.5	1706	163.7	4536	8.83	162.6	604.4
01DS-05 L 667	110	2.7	18864	103.72	1.33	301.69	1.70	41.50	132.11	40.07	599.8	176.33	1789.87	518.01	1801.1	338.1	2385	227.2	4838	11.19	288.8	919.2
01DS-05 L 668	107	2.7	11026	188.93		276.02	0.33	16.74	62.06	21.33	320.0	97.87	960.94	272.65	918.2	164.2	1198	113.2	6539	28.81	467.3	802.9
01DS-05 L 669	95	1.1	4256	91.20		122.87	0.12	6.71	31.26	10.20	158.1	57.88	605.01	176.84	601.3	110.8	815	74.5	5309	15.40	112.7	432.8
01DS-05 L 670	59	0.3	3906	28.46	0.30	55.80	0.21	6.91	26.88	9.03	140.1	46.49	500.84	145.56	531.1	101.8	712	62.3	5105	5.55	51.4	253.4
01DS-05 L 671	59	1.5	9660	67.65		161.34	0.44	13.27	49.91	17.07	266.5	90.87	998.56	295.19	1023.8	192.9	1380	135.3	4989	7.45	142.0	527.3
01DS-05 L 672	125	3.1	16927	133.19	0.09	307.95	1.02	34.71	109.67	37.27	523.9	159.98	1579.72	460.95	1582.9	286.5	2003	181.7	4960	15.83	338.6	888.0
01DS-05 L 673	68	1.3	13205	51.63	0.25	131.54	1.21	26.68	82.08	25.45	381.6	124.46	1307.66	378.19	1306.3	247.6	1783	162.7	6000	7.31	144.1	476.6
01DS-05 L 674																						
01DS-05 L 675	86	1.8	8606	193.90		295.53	0.37	16.72	87.89	29.88	434.6	121.63	1126.12	276.51	827.6	140.4	930	85.6	6236	26.02	215.5	760.0
01DS-05 L 676	76	2.0	10894	224.00		369.08	0.30	16.92	79.22	26.86	464.8	130.87	1209.90	302.89	873.1	148.7	1000	90.5	6270	33.78	386.8	880.6
01DS-05 L 677	150	4.2	14558	235.07		404.47	0.56	24.02	110.28	35.21	486.4	147.10	1444.85	399.08	1313.6	233.1	1624	140.0	4578	25.18	464.5	1056.7

01DS-05 L 678	138	4.7	14851	220.79		407.87	0.59	28.59	109.47	35.99	506.0	151.25	1516.44	418.43	1319.7	236.2	1642	137.9	4871	22.52	388.4	1009.2
01DS-05 L 679	71	1.2	4069	91.91		123.68	0.17	7.64	34.98	11.92	190.8	62.02	619.08	175.00	590.1	113.1	811	70.1	5162	16.58	86.5	417.0
01DS-05 L 680	80	0.8	7132	45.98		108.93	0.73	17.86	59.52	20.54	297.4	88.64	867.39	245.90	840.3	153.2	1123	103.2	4988	7.09	89.3	396.8
01DS-05 L 681	22	0.9	586	20.86	0.25	24.81	0.13	1.73	6.39	2.34	35.1	11.09	121.06	35.64	118.3	22.5	159	16.1	5755	4.22	27.6	130.6
01DS-05 L 682	134	2.5	9862	168.21	0.30	226.81	0.46	12.42	56.22	19.89	301.4	95.06	978.44	294.29	1048.9	195.3	1407	120.9	4741	20.80	245.1	741.6
01DS-05 L 683	118	2.0	8344	166.50		223.75	0.19	8.35	49.36	17.69	250.6	86.28	884.63	263.57	901.0	168.5	1181	104.0	5087	24.05	310.6	756.0
01DS-05 L 684	29	0.3	295	4.53	0.11	7.91	0.06	0.42	1.84	0.95	13.6	5.56	59.43	19.90	73.7	14.4	112	10.2	5851	2.09	6.0	37.6
01DS-05 L 685	84	1.1	11008	40.63		107.36	0.86	23.47	69.67	22.21	313.9	105.57	1109.23	323.30	1101.3	207.7	1524	134.2	4846	6.62	135.5	448.5
01DS-05 L 686	140	4.4	13500	214.53		337.67	0.40	20.81	85.94	28.01	429.0	136.48	1323.67	386.87	1226.6	219.7	1531	133.4	5108	25.96	377.1	892.1
01DS-05 L 687	106	3.0	12536	206.04		304.73	0.48	15.88	76.15	25.69	366.4	117.64	1229.80	338.02	1121.5	202.8	1377	125.6	5083	25.00	357.8	819.2
01DS-05 L 688	30	0.6	328	8.28	0.07	10.42	0.07	0.70	2.83	0.92	15.3	5.76	61.62	19.33	67.0	13.7	98	10.3	6315	2.53	14.4	51.5
01DS-05 L 689																						
01DS-05 L 690	125	4.8	13118	203.87	0.68	323.09	0.56	17.78	72.00	25.43	384.0	116.70	1195.23	341.35	1144.7	212.5	1428	135.2	5453	26.02	480.0	868.5
01DS-05 L 691	149	3.2	16910	202.52		449.92	1.30	40.79	133.98	40.54	600.8	174.02	1627.62	461.09	1487.7	267.5	1785	169.8	5535	23.36	417.4	1007.5
01DS-05 L 692	107	3.2	17926	148.94	0.39	341.02	1.72	41.94	140.43	43.01	610.4	167.93	1692.86	499.52	1643.4	298.9	2093	206.5	5940	18.02	366.8	891.4
01DS-05 L 693	96	3.6	12138	221.23	0.03	293.82	0.29	12.72	70.75	22.65	376.9	124.23	1260.04	351.94	1087.0	179.9	1238	120.2	6093	30.02	359.5	873.2

01DS-05 L 694	76	0.7	8745	47.22		120.71	0.58	18.99	62.44	20.14	313.4	100.70	1039.77	303.10	1014.1	180.5	1262	124.6	5840	6.73	131.8	432.0
01DS-05 L 695	85	1.9	12622	154.17		302.74	0.30	10.80	49.58	20.14	324.9	114.18	1208.84	347.63	1182.1	211.8	1438	143.3	5989	15.47	246.5	569.9
01DS-05 L 696	65	0.3	9184	37.56	0.19	101.51	0.72	18.98	57.84	20.26	301.2	96.14	975.83	290.31	989.1	182.1	1300	136.7	5433	6.24	92.3	366.4
01DS-05 L 697	138	3.6	14541	232.21		375.89	0.41	17.58	70.57	28.24	420.9	132.73	1339.08	388.13	1288.1	225.3	1500	149.7	5722	28.18	467.3	873.7
01DS-05 L 699																						
01DS-05 L 700	76	1.0	15075	53.19	0.13	150.02	1.29	26.88	93.17	31.87	444.8	141.19	1483.15	409.49	1345.9	234.8	1592	169.8	6541	8.17	177.5	518.4
01DS-05 L 701																						
01DS-05 L 702	141	1.8	9880	169.45		213.59	0.30	8.53	52.40	18.49	314.7	106.37	1163.55	336.62	1178.2	204.9	1294	136.9	6376	21.83	459.8	817.0
01DS-05 L 703	81	1.0	16757	83.47		240.26	0.61	24.78	79.88	28.02	443.0	144.22	1506.45	473.24	1745.3	319.2	2226	256.0	5438	8.65	199.1	558.0
01DS-05 L 704	29	2.0	1256	15.90	0.70	13.11	2.41	15.24	6.94	0.84	14.1	9.54	198.60	100.93	502.0	102.7	664	62.2	16633	12.69	29.0	97.1
01DS-05 L 706	138	0.9	3607	134.80	0.01	153.46	0.20	5.87	27.68	10.47	183.4	61.07	678.05	226.84	893.9	168.7	1178	138.8	6576	24.13	306.7	575.3
01DS-05 L 707	235	5.1	17873	219.72	7.03	417.38	4.84	53.93	124.70	37.82	567.8	169.50	1650.93	480.04	1680.7	299.4	1960	216.1	5764	23.14	522.9	1262.6
01DS-05 L 708	81	1.3	14516	60.63	0.79	147.70	0.68	17.49	58.95	20.58	364.8	125.60	1329.57	408.90	1452.5	253.5	1690	195.2	6499	7.39	159.2	492.0
01DS-05 L 709	100	1.7	5420	135.80	0.06	167.37	0.15	6.46	37.98	12.30	227.6	75.83	819.11	248.10	872.9	151.7	982	116.1	6980	23.16	270.3	609.4
01DS-05 L 710	165	3.2	15010	194.35	0.54	282.87	0.49	18.96	77.83	26.64	441.2	141.46	1407.56	396.84	1347.0	217.4	1323	151.4	7436	25.50	249.7	673.1
01DS-05 L 711	165	2.9	16157	205.87		305.49	0.35	21.41	91.08	30.43	498.0	152.07	1506.33	423.25	1417.3	228.4	1411	159.8	7798	25.93	273.5	716.4

01DS-05 L 712	181	4.4	16204	229.42	0.07	351.11	0.46	20.03	82.13	25.67	434.9	132.65	1334.68	389.88	1333.9	217.7	1394	166.4	6618	30.34	663.5	927.4
01DS-05 L 713	102	1.2	14198	41.13	0.56	140.10	1.27	26.34	81.13	24.23	395.3	126.93	1318.24	390.54	1410.8	244.9	1616	190.1	6549	6.14	165.8	493.6
01DS-05 L 714	148	1.1	10813	81.80	0.00	133.78	0.59	11.71	47.09	17.88	265.1	96.58	998.30	296.20	1042.8	176.1	1149	138.1	6434	14.57	204.8	541.7
01DS-05 L 715	263	4.3	24609	196.62	0.78	454.05	2.05	50.07	164.41	53.74	808.3	236.09	2336.89	655.38	2156.0	350.0	2142	229.6	5527	23.71	727.8	1144.2
01DS-05 L 716	259	4.3	20898	265.36	2.21	536.62	2.81	55.26	155.89	50.16	736.2	215.23	2024.28	568.00	1863.8	308.5	1905	199.5	5728	28.15	510.2	1192.9

Analysis	**P**	**Ti**	**Y**	**Nb**	**La**	**Ce**	**Pr**	**Nd**	**Sm**	**Eu**	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**	**Hf**	**Ta**	**Th**	**U**
2KE085A																						
<10% discordant																						
2KE085A L 149	120	11.1	3151	7.93	0.12	15.67	0.87	18.27	27.28	2.95	123.3	38.03	395.96	128.25	468.0	100.4	935	112.8	8669	4.56	297.8	254.4
2KE085A L 150	174	10.1	4592	14.42	0.10	20.47	1.17	19.50	39.60	4.17	183.8	54.30	586.42	189.98	679.3	148.3	1364	172.1	8605	6.54	503.5	374.1
2KE085A L 151	211	8.5	2537	28.38		51.81	0.54	7.68	14.19	1.05	84.9	27.37	294.93	98.41	374.3	82.1	779	92.9	10344	15.95	696.9	541.8
2KE085A L 152	172	8.1	4076	12.55	0.14	20.26	0.98	17.80	33.83	2.41	149.3	46.82	504.82	159.43	606.8	126.1	1157	148.1	9726	6.87	469.8	387.9
2KE085A L 153	204	7.5	4861	16.34	0.19	27.06	1.27	22.78	47.96	3.67	197.2	55.83	586.05	187.94	715.8	152.9	1398	172.7	9458	7.18	575.7	443.5
2KE085A L 154	91	7.1	1528	4.14		12.74	0.28	6.54	11.64	1.24	49.5	16.67	187.61	59.00	230.2	52.2	495	59.6	9999	3.58	120.3	139.4
2KE085A L 156	164	8.6	2566	8.58	0.21	16.86	0.69	14.03	24.10	2.36	103.4	32.12	323.61	102.66	387.2	86.5	852	95.4	8193	3.88	233.4	219.0

2KE085A L 157	208	9.5	1484	13.34		24.42	0.35	5.10	10.06	0.81	47.0	14.30	171.70	55.87	226.2	51.4	512	56.4	8738	7.38	556.8	425.1
2KE085A L 158	92	9.1	1357	3.97	0.11	11.64	0.31	8.87	13.86	1.43	51.9	15.88	166.41	52.78	204.5	46.2	459	53.1	7921	2.14	97.0	116.2
2KE085A L 160	280	10.9	6211	30.31	0.20	41.22	1.62	31.35	71.76	6.52	269.6	81.83	843.99	251.34	919.4	201.7	1998	207.0	7365	9.97	855.4	630.6
2KE085A L 162	234	13.9	3437	16.87	0.60	25.77	1.09	20.80	42.52	3.99	146.3	45.83	456.86	146.28	520.9	114.6	1194	122.5	6782	5.96	562.7	409.4
2KE085A L 164	195	8.8	3279	18.85	0.18	33.46	0.94	16.62	33.37	3.31	137.3	41.71	412.51	130.22	488.8	108.0	1058	109.4	6838	9.00	533.8	498.6
2KE085A L 165	199	10.0	4010	17.21	0.16	27.56	1.02	23.45	51.74	4.07	180.6	52.86	548.94	165.96	595.5	137.8	1427	136.3	6188	6.94	466.6	434.5
2KE085A L 167	163	8.6	1823	23.93		42.40	0.42	7.61	12.59	0.94	61.4	20.88	226.84	73.11	273.1	64.9	656	64.9	7243	11.34	432.1	467.1
2KE085A L 168	122	8.1	2081	6.83	0.05	13.29	0.69	11.99	24.77	2.13	86.6	26.38	282.51	85.46	314.5	72.1	762	71.6	6509	3.98	204.6	255.9
2KE085A L 169	201	4.8	4481	23.25	0.17	37.24	1.03	19.36	38.07	2.57	161.9	54.62	557.06	181.63	659.8	156.7	1543	144.7	7081	10.02	724.2	778.7
2KE085A L 170	176	4.3	4424	25.69	0.11	41.61	1.10	18.15	39.52	2.83	164.9	51.94	541.38	177.15	638.5	157.1	1524	146.7	7168	11.44	759.3	872.0
2KE085A L 172																						
2KE085A L 173	148	10.4	3880	11.57	0.10	17.97	0.80	19.91	37.91	2.97	151.6	46.90	497.79	158.58	585.9	124.9	1171	141.2	8330	5.89	410.9	324.5
2KE085A L 174	159	10.3	2966	7.51	0.13	16.38	1.06	19.61	31.87	2.61	121.2	36.13	381.65	118.24	457.6	95.4	927	116.0	8555	4.19	258.6	214.4
2KE085A L 175	258	13.4	6208	24.84	0.25	48.30	2.15	38.31	75.36	6.88	267.6	80.32	810.35	242.43	901.4	191.0	1751	210.9	8352	9.04	902.0	516.6
2KE085A L 176																						
2KE085A L 177																						

2KE085A L 178	195	9.8	3973	13.47	0.09	21.77	1.15	20.41	38.61	3.84	162.6	47.54	515.81	158.07	601.4	131.0	1261	141.9	7871	7.07	457.2	388.2
2KE085A L 179	198	4.5	3969	16.49	0.08	28.57	1.01	18.32	35.85	2.35	144.5	46.77	477.38	156.64	604.3	134.3	1276	138.2	9175	9.04	539.2	544.4
2KE085A L 180	146	8.6	2823	9.08	0.15	16.23	0.91	16.17	27.07	2.70	105.1	33.81	366.32	112.77	425.5	96.4	951	100.9	7614	5.14	271.5	276.0
2KE085A L 181	153	4.6	2898	9.97	0.05	24.30	0.67	13.52	24.55	1.78	111.0	34.79	368.96	121.84	438.3	99.0	980	102.4	9624	6.62	381.0	428.9
2KE085A L 182	253	10.1	5043	21.15	0.20	24.31	1.16	18.78	42.80	4.09	204.0	61.15	654.00	202.62	759.2	165.0	1619	170.0	7399	8.67	731.3	592.1
2KE085A L 183	138	5.5	1882	5.88	0.03	16.74	0.58	9.52	18.90	1.17	75.1	22.49	234.94	74.18	287.9	63.9	646	67.2	8729	4.13	180.0	228.5
2KE085A L 184	194	7.1	3937	16.73	0.10	24.07	1.11	19.39	38.99	3.66	162.9	47.39	511.65	155.36	601.7	130.2	1234	130.0	7375	7.37	514.0	469.9
2KE085A L 185	206	9.3	4318	17.90	0.20	30.69	1.22	22.00	46.54	3.73	179.8	55.63	573.09	175.49	643.7	136.6	1441	143.9	7247	7.58	540.8	493.5
2KE085A L 186	168	10.6	2827	9.86	0.09	15.37	0.76	15.39	27.94	3.14	115.5	35.66	383.49	114.74	430.1	92.8	964	102.5	7000	5.14	298.0	308.2
2KE085A L 187	187	7.0	3476	15.00	0.06	22.53	0.94	16.49	32.95	2.84	132.7	41.84	452.08	140.12	535.2	116.9	1179	117.3	7680	6.95	435.4	456.8
2KE085A L 188	161	8.0	2253	6.74	0.02	14.10	0.82	13.96	27.32	2.46	93.1	28.17	286.34	90.53	335.5	77.5	770	76.9	7007	4.00	209.7	239.7
2KE085A L 189	237	9.9	4252	22.74	0.17	31.10	1.78	26.35	48.53	4.77	185.8	56.64	582.43	176.41	652.0	142.3	1446	141.9	6429	6.57	556.5	483.0
2KE085A L 190	201	9.9	3572	13.41	0.08	20.89	1.11	19.19	38.52	3.82	155.6	46.24	485.87	146.17	538.9	123.8	1231	121.4	6169	5.67	440.0	403.8
2KE085A L 191	118	7.5	2302	7.17	0.06	15.08	0.70	13.69	25.66	1.76	89.4	29.03	308.93	93.85	343.7	80.7	810	80.4	6461	4.11	240.3	279.9
2KE085A L 192	208	10.1	3410	14.15	0.17	21.45	1.03	19.41	41.94	4.04	151.2	41.61	452.45	131.26	497.1	115.6	1202	110.7	5765	6.40	360.5	374.4
2KE085A L 194	139	6.6	2073	6.77	0.04	13.64	0.63	12.55	19.94	1.57	87.3	24.47	272.45	81.83	309.4	73.7	732	71.3	6563	3.78	205.5	265.5

2KE085A L 195	190	7.3	3348	15.02	0.06	20.30	0.95	16.52	31.19	2.85	134.5	42.82	444.15	144.24	503.1	114.4	1216	119.7	6364	6.97	424.1	466.3
2KE085A L 196	119	8.2	1905	5.76	0.06	12.87	0.72	10.63	23.45	2.22	84.9	25.33	256.23	78.71	285.7	65.1	679	64.4	6347	3.48	174.3	227.9
2KE085A L 197	168	8.3	3173	13.74	0.09	19.72	0.97	17.22	32.15	3.04	129.8	38.25	427.77	127.42	478.2	108.2	1152	107.8	6087	6.75	380.1	422.5
2KE085A L 198	169	11.0	2968	14.51		23.96	1.12	21.93	38.83	3.89	133.0	39.48	394.70	122.49	424.5	103.5	1046	96.8	5720	5.25	380.0	370.6
2KE085A L 199	195	6.6	3331	14.97	0.06	22.37	0.82	17.09	28.86	2.79	145.8	41.83	431.61	136.27	508.3	114.3	1170	108.5	6792	7.47	438.5	491.7
2KE085A L 200	134	5.5	2261	7.65		18.72	0.95	13.07	23.31	1.74	88.2	27.44	290.52	93.84	349.3	80.0	851	80.1	7545	5.74	264.6	353.7
2KE085A L 202	200	9.7	3585	17.06	0.15	26.39	1.12	22.33	45.42	4.14	162.4	48.67	470.87	151.39	540.0	126.5	1286	126.0	5799	6.84	474.8	461.2
2KE085A L 204	134	10.5	1357	7.98		11.78	0.36	6.67	12.22	1.58	50.2	15.12	165.00	56.53	216.0	51.7	562	58.6	6038	4.48	124.3	194.6
2KE085A L 205	279	10.0	5670	29.77	0.22	33.93	1.28	24.73	50.54	5.77	227.3	70.29	750.30	228.59	830.9	186.8	1879	180.7	6287	8.76	864.0	685.0
2KE085A L 206	315	12.7	5481	42.93	0.74	53.13	1.29	23.14	42.70	3.79	202.8	68.01	708.50	222.31	803.3	182.2	1802	175.2	6226	11.24	1359.5	863.7
>10% discordant																						
2KE085A L 155	192	14.3	4141	18.41	0.23	36.19	1.57	32.52	45.63	5.01	169.7	51.44	530.71	163.31	607.1	135.4	1271	146.7	7661	8.20	637.1	451.5
2KE085A L 159	206	8.2	4045	17.70	0.08	24.18	0.98	15.23	36.03	3.63	157.2	49.52	514.22	163.34	598.2	136.6	1308	138.4	7969	6.64	559.9	459.6
2KE085A L 161	189	11.3	4193	15.97	0.13	27.68	1.20	28.46	47.50	4.92	173.0	53.91	555.41	170.86	616.3	139.2	1407	146.7	6837	6.47	478.6	410.3
2KE085A L 163	195	8.9	3137	11.47	0.10	20.45	1.00	19.09	36.30	3.21	138.3	40.02	421.48	126.85	462.9	102.0	1082	107.8	6973	5.51	362.0	372.6
2KE085A L 166	132	7.2	1156	13.39		24.35	0.15	4.92	9.75	0.43	34.1	12.28	138.62	46.22	173.6	42.5	428	43.3	7233	7.34	251.3	314.3

2KE085A L 171	91	7.4	1208	3.38		10.42	0.42	7.98	12.99	1.03	49.9	14.08	159.27	49.01	176.0	44.3	463	44.3	6237	2.34	97.3	145.1
2KE085A L 193	81	6.6	1192	3.84		10.34	0.27	8.33	15.37	1.13	48.3	15.62	161.24	50.41	185.1	42.7	456	44.9	6823	2.22	97.3	145.7
2KE085A L 201	115	4.8	1811	5.98		16.51	0.44	9.70	17.89	1.25	64.2	21.14	233.46	74.27	268.6	64.5	674	61.9	7366	4.11	189.0	268.6
2KE085A L 203	157	9.9	2514	9.62	0.11	13.96	0.88	14.04	24.51	2.75	108.8	31.62	335.04	100.75	382.5	86.4	910	87.4	6304	4.79	251.2	293.9

Analysis	**P**	**Ti**	**Y**	**Nb**	**La**	**Ce**	**Pr**	**Nd**	**Sm**	**Eu**	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**	**Hf**	**Ta**	**Th**	**U**
3KE043																						
<10% discordant																						
3KE043 L 207	153	14.0	2944	14.23	0.28	15.62	1.04	16.05	34.41	10.50	133.2	39.56	396.60	121.68	433.3	89.3	786	94.5	8855	4.32	155.8	152.1
3KE043 L 209	160	20.5	1050	7.01		3.05	0.15	3.41	7.08	3.16	27.8	9.01	108.32	40.82	166.1	38.2	378	51.8	7935	2.23	42.8	78.3
3KE043 L 211	174	9.0	2087	9.15		11.43	0.26	8.32	17.32	2.67	66.1	23.01	254.16	80.46	312.2	68.7	608	74.9	11231	6.06	104.1	138.8
3KE043 L 213	144	16.1	1043	4.96		5.95	0.14	3.20	6.24	1.72	36.6	11.82	123.12	42.44	168.3	34.6	334	42.1	10833	2.68	49.1	69.0
3KE043 L 215	158	21.9	797	4.22		2.28	0.15	2.11	5.60	3.10	25.0	7.47	85.14	29.08	126.3	29.9	285	39.4	8088	1.87	23.3	46.7
3KE043 L 216	148	22.5	1529	2.40	0.12	3.28	0.45	11.17	18.24	10.42	68.9	19.84	198.29	58.52	229.5	47.7	444	59.2	8211	1.35	28.0	36.8
3KE043 L 217	184	27.2	549	1.95	0.02	2.03	0.05	2.36	3.22	2.60	16.8	5.77	60.83	20.10	83.6	19.1	192	24.7	8006	1.11	16.1	27.4
3KE043 L 220	202	7.1	1260	13.36		9.87	0.13	3.19	7.52	1.49	34.1	13.18	146.83	49.95	201.4	44.4	459	52.3	10482	7.74	71.5	128.7

3KE043 L 221	153	15.4	812	7.84		6.49	0.17	2.33	6.21	2.88	29.4	9.92	101.06	31.80	121.7	26.8	273	30.8	7586	3.12	52.1	78.1
3KE043 L 224	159	25.1	1211	2.38		2.78	0.53	10.52	18.50	10.45	62.2	17.06	173.45	51.17	179.9	39.7	410	46.7	6733	1.06	24.2	36.9
3KE043 L 225	138	19.6	720	5.22		2.49	0.12	2.72	4.99	2.72	21.3	7.11	78.29	28.81	110.6	26.2	293	33.7	7003	2.05	18.2	44.2
3KE043 L 226																						
3KE043 L 231	143	24.1	286	1.14		1.43		0.70	1.49	1.45	8.5	2.57	32.14	11.03	42.9	9.3	101	15.3	8966	0.80	3.78.0	
3KE043 L 233	163	16.0	780	4.53		2.91	0.09	2.21	6.18	2.49	26.1	7.94	88.94	29.15	125.3	27.3	298	39.2	8787	2.40	17.4	46.5
3KE043 L 235	207	14.3	2796	12.42	0.16	14.19	0.92	21.60	40.37	14.91	137.9	40.15	406.77	118.75	427.2	85.4	767	93.0	8391	2.90	144.7	126.4
3KE043 L 238	150	11.9	2463	11.59	0.06	11.44	0.43	14.50	26.76	10.50	113.6	33.32	352.04	104.16	375.1	79.8	746	78.8	8181	4.39	117.3	156.1
3KE043 L 241	171	8.8	1014	12.66	0.06	9.25	0.21	4.58	9.68	3.05	39.8	12.29	125.33	41.82	157.2	37.9	396	38.1	7458	5.34	54.3	120.3
3KE043 L 243	175	21.4	716	4.86		2.05	0.11	2.79	4.71	2.96	20.3	6.72	76.75	27.77	113.4	27.1	313	32.9	5687	1.56	22.1	58.6
3KE043 L 244	148	15.5	1413	4.23		4.08	0.34	6.58	14.26	4.67	60.2	17.53	185.24	57.72	209.2	46.6	475	46.8	6734	2.23	52.5	83.3
3KE043 L 245																						
3KE043 L 246	135	16.7	1360	3.94	0.09	4.64	0.49	9.57	19.29	8.51	71.9	18.95	190.60	56.02	211.0	45.4	460	46.5	5862	1.83	38.6	66.0
3KE043 L 247	60	15.9	674	1.76		2.34	0.12	4.79	9.10	4.22	31.1	8.35	86.24	28.67	99.7	22.7	251	25.0	6049	0.87	14.5	29.7
3KE043 L 248	116	11.4	1603	6.41	0.07	8.08	0.40	13.65	20.16	7.88	75.1	23.34	235.20	69.68	241.1	52.0	515	50.0	6286	2.84	52.3	92.0
3KE043 L 250	134	17.8	555	5.06		2.60	0.11	2.70	4.22	2.29	18.6	5.87	66.14	21.72	88.3	21.4	226	24.3	5989	1.83	26.3	50.3

3KE043 L 252	89	9.0	1104	4.96		5.29	0.50	9.10	14.47	6.53	54.8	15.98	157.10	48.41	165.9	36.6	376	36.1	6413	1.77	29.0	56.9
3KE043 L 253																						
3KE043 L 254																						
3KE043 L 257	148	14.6	1691	11.71		9.89	0.60	9.76	20.89	8.68	73.2	24.02	244.39	70.25	250.5	53.9	569	54.2	6167	3.81	80.7	116.4
3KE044 L 259	223	14.0	2822	19.52	0.45	55.09	1.93	28.04	34.73	4.38	116.2	33.80	341.84	109.18	410.7	87.1	864	97.1	7974	11.23	530.1	311.3
3KE044 L 260	131	11.9	819	20.02	0.36	20.20	0.37	4.22	5.75	0.64	23.8	7.47	86.60	29.71	126.5	34.1	366	49.1	8810	20.48	253.2	282.1
>10% discordant																						
3KE043 L 208																						
3KE043 L 210	156	18.8	520	2.87		2.15	0.04	1.13	3.23	1.95	15.9	5.35	62.49	20.10	78.0	18.3	170	23.1	8524	1.44	11.4	23.2
3KE043 L 212	183	7.6	1886	14.21	0.53	12.65	0.34	7.00	15.17	2.69	65.5	21.05	225.17	78.13	289.9	61.9	583	75.5	11228	6.46	108.4	148.1
3KE043 L 214	233	14.4	4127	15.30	0.19	15.12	1.00	22.15	40.59	15.68	173.9	53.92	541.72	168.70	620.6	125.2	1121	141.5	9678	5.60	179.2	186.3
3KE043 L 218	164	13.8	1335	11.26	0.34	8.15	0.29	6.49	10.41	4.65	48.3	14.74	162.09	52.99	199.8	43.5	426	52.5	8637	3.53	66.1	92.0
3KE043 L 219	122	23.0	1194	3.18	0.02	3.24	0.34	7.65	14.36	8.66	55.6	15.74	157.06	49.39	182.3	38.3	389	48.7	7994	1.32	25.3	37.8
3KE043 L 222	137	21.8	223	0.94		1.07	0.04	0.62	1.00	0.76	7.1	2.33	26.96	8.73	33.8	8.9	87	10.7	7346	0.44	3.0	9.2
3KE043 L 223	204	12.5	1350	9.01	0.42	11.89	0.35	4.51	10.40	2.03	45.4	15.39	166.42	54.45	211.8	46.5	485	52.8	9539	5.16	90.8	143.0
3KE043 L 227	164	15.1	1446	4.08	0.18	5.55	0.25	5.75	12.41	3.46	55.6	17.47	183.56	57.20	218.7	47.4	434	56.9	9914	2.23	56.5	70.7

3KE043 L 228	106	9.0	478	4.11		3.42	0.01	0.64	2.47	0.54	13.2	4.17	46.54	19.15	77.3	17.2	175	23.5	10115	2.63	17.7	36.1
3KE043 L 229	186	8.4	1373	8.97		8.49	0.14	4.48	9.23	1.90	42.4	14.81	163.01	51.94	212.8	46.6	437	58.2	11265	5.55	69.1	105.7
3KE043 L 230	143	8.0	1020	13.31		7.45	0.04	2.10	5.33	1.52	30.3	10.73	112.83	40.01	158.2	34.5	352	44.3	10607	6.43	46.7	88.0
3KE043 L 232	168	12.3	2706	8.82	0.20	8.82	0.77	19.31	32.28	15.22	131.6	36.94	374.71	112.77	400.7	81.7	754	93.6	8555	3.36	100.7	110.5
3KE043 L 234	185	24.2	605	3.11	0.39	2.04	0.23	2.36	4.50	2.81	20.1	6.02	67.42	24.15	97.4	22.6	240	33.0	7792	1.32	13.0	32.4
3KE043 L 236	144	8.5	1268	8.26		10.18	0.15	4.22	9.92	1.54	42.1	14.27	153.69	53.02	202.5	44.5	447	48.7	10781	4.65	82.6	138.3
3KE043 L 237	95	16.8	311	2.06		1.72		1.00	1.88	1.42	11.8	3.36	39.42	12.12	46.5	11.9	124	14.8	7781	0.85	6.8	17.9
3KE043 L 239	116	19.0	617	1.69		2.10	0.23	4.86	6.64	5.35	28.8	8.43	82.04	28.10	92.2	21.7	220	24.5	6047	0.78	10.7	21.5
3KE043 L 240	120	20.4	511	3.29		1.56	0.07	1.79	3.58	2.34	15.5	5.01	55.54	19.88	82.4	18.3	211	24.2	5927	1.44	15.7	40.3
3KE043 L 242	84	16.4	124	0.70		0.95		0.11	0.87	0.76	2.6	1.35	14.11	5.40	20.7	5.1	58	6.4	6402	0.44	2.4	8.5
3KE043 L 249	127	23.4	302	1.89		1.49	0.06	1.03	2.02	1.48	11.8	3.27	37.97	11.75	46.8	10.9	124	14.0	5858	0.78	7.3	20.0
3KE043 L 251	114	9.5	551	7.34	0.01	5.63	0.10	1.72	4.99	1.90	20.7	6.01	72.43	23.22	84.7	19.7	207	21.2	6853	2.56	42.0	62.6
3KE043 L 255	88	16.0	396	1.48		1.92	0.11	2.42	4.70	2.14	18.4	4.39	51.40	16.00	57.7	14.8	159	15.9	6491	0.68	8.1	17.3
3KE043 L 256	134	14.6	661	2.76	0.05	3.96	0.48	7.89	8.98	6.69	32.8	9.62	91.50	27.73	103.9	21.4	230	23.7	6681	1.03	29.3	39.1
3KE043 L 258	153	27.9	285	1.13		1.23	0.03	1.02	2.47	1.99	11.5	2.87	35.46	11.48	43.2	10.5	115	13.1	5866	0.64	5.1	13.6

Analysis	P	Ti	Y	Nb	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	Th	U
3KE044																						
<10% discordant																						
3KE044 L 261	151	22.4	1871	18.20	0.06	81.85	0.36	5.24	5.18	1.17	25.0	9.15	116.10	46.76	231.7	66.2	733	101.6	12418	6.96	729.6	114.5
3KE044 L 263	77	10.7	1238	3.24		11.35	0.43	7.62	8.49	1.06	38.6	12.73	125.71	46.20	182.6	41.7	373	46.9	8510	3.26	101.6	91.7
3KE044 L 264	103	10.9	1655	2.42	0.05	13.76	0.56	10.08	14.74	1.38	52.3	15.77	184.92	60.66	252.5	53.5	501	60.6	9336	3.09	175.3	143.3
3KE044 L 265	201	8.5	3959	13.27	0.48	47.54	1.64	24.64	42.40	4.22	155.2	47.60	479.99	153.52	586.5	121.2	1084	129.5	8602	9.01	931.4	517.3
3KE044 L 266	119	13.5	704	4.22		14.24	0.09	1.43	2.66	0.30	11.3	4.27	54.42	22.25	104.7	27.8	297	40.4	8678	4.13	339.6	222.6
3KE044 L 267	119	19.9	1094	5.93		20.04	0.22	3.71	6.01	0.83	24.9	8.79	107.48	38.50	159.8	39.3	381	45.3	8130	5.15	691.5	418.1
3KE044 L 268	102	12.7	702	2.42	0.04	8.44	0.13	2.55	4.38	0.64	20.8	6.82	79.91	25.89	111.0	24.9	221	29.7	8925	2.98	105.9	93.3
3KE044 L 269	132	13.1	1499	3.84	0.04	13.04	0.42	7.02	13.76	1.50	53.0	15.36	177.65	59.46	231.5	51.1	469	55.6	8328	3.35	129.1	109.9
3KE044 L 270	134	31.0	1349	3.55	0.06	12.88	0.42	8.47	9.16	2.31	36.7	12.06	136.47	48.55	203.5	49.3	492	59.5	10214	3.33	329.5	260.5
3KE044 L 271	136	32.4	1862	3.75	0.14	15.68	0.83	10.83	14.60	4.22	54.2	17.74	197.47	66.07	269.5	62.5	602	71.4	9838	3.42	383.4	253.0
3KE044 L 273	184	14.0	4119	12.66	0.26	54.03	2.38	38.47	51.99	6.41	167.6	50.00	512.71	162.00	609.1	134.7	1238	140.5	6773	6.38	546.0	318.4
3KE044 L 277	92	24.0	1493	8.89		28.35	0.14	3.44	5.55	1.67	26.7	10.49	137.64	51.39	227.0	58.3	591	63.5	6012	5.68	263.8	190.9
3KE044 L 281	119	12.3	1655	4.62	0.16	22.93	0.89	13.01	19.40	2.51	61.3	19.08	203.09	67.44	252.8	58.6	586	56.3	5956	3.25	263.8	214.2

3KE044 L 284	211	25.2	2358	7.91	0.14	15.69	1.04	17.49	26.04	4.84	96.1	27.81	296.92	93.64	348.1	76.4	762	79.9	6527	4.58	304.2	243.4
3KE044 L 286																						
3KE044 L 287	112	23.1	1279	2.07	0.04	9.07	0.29	6.66	11.08	2.30	38.3	12.77	137.38	46.03	186.2	40.9	429	53.6	10268	2.10	266.2	215.4
3KE044 L 288	77	19.2	342	1.51		5.12	0.00	0.28	1.28	0.35	6.9	2.75	30.29	11.66	49.8	12.9	140	18.8	10872	2.30	305.9	366.4
3KE044 L 289	150	13.9	4424	12.03	0.13	48.98	2.07	34.84	47.90	5.88	177.1	50.30	540.09	171.48	649.7	137.5	1243	150.3	7545	6.15	609.5	309.9
3KE044 L 290	184	17.9	3382	22.79	0.15	77.75	0.75	14.93	27.06	3.98	125.3	37.54	378.58	127.19	499.5	109.8	956	119.5	7056	12.07	1147.4	493.4
3KE044 L 291	139	11.4	1295	5.21	0.04	11.79	0.40	5.98	8.31	1.45	36.3	11.85	131.85	47.37	187.0	40.4	384	48.6	8229	3.74	109.2	91.1
3KE044 L 293	140	20.4	3972	10.14	0.24	52.64	2.08	26.79	33.43	5.63	124.6	40.76	424.04	141.88	567.6	123.9	1132	134.0	7678	6.35	607.1	333.6
3KE044 L 295	126	12.4	504	3.18		6.43	0.09	1.27	3.08	0.56	14.3	4.72	51.04	18.31	80.0	18.4	181	21.9	8599	2.41	82.2	66.1
3KE044 L 296																						
3KE044 L 300	103	8.3	920	7.62		20.52	0.26	4.25	6.39	0.53	24.6	7.59	94.19	33.78	136.1	34.6	359	42.4	9418	9.03	205.9	195.1
3KE044 L 301	119	8.7	1073	12.16		26.71	0.33	4.93	6.70	0.19	24.6	9.22	105.78	37.13	153.7	40.1	448	49.9	9753	15.15	348.4	277.2
3KE044 L 303	152	19.9	2765	8.42	0.16	38.32	1.49	24.20	32.02	3.47	104.2	31.72	327.48	105.43	411.6	89.8	885	93.5	6112	5.20	352.1	258.1
3KE044 L 304	122	16.4	1783	4.90	0.10	22.38	0.95	14.20	19.37	2.15	67.2	18.81	211.83	66.37	263.9	60.2	601	59.3	6382	3.90	192.3	163.0
3KE044 L 306	168	21.8	2164	7.28	0.14	21.04	1.20	20.31	28.87	3.32	91.7	27.94	278.21	85.53	307.5	69.1	724	71.8	7090	4.18	282.9	249.7
3KE044 L 309	87	12.2	903	4.48	0.11	15.80	0.38	5.35	6.88	1.19	26.4	8.34	97.24	34.46	141.1	35.4	360	35.9	5338	2.77	247.8	176.4

3KE044 L 310	168	14.3	4381	16.97	0.55	76.72	3.37	48.99	56.90	7.97	171.7	50.85	532.91	171.88	644.2	149.0	1468	145.4	5256	6.74	899.3	487.3
3KE044 L 311	108	15.0	1906	3.64	0.07	21.34	0.88	14.53	17.56	2.23	62.8	19.69	219.45	67.65	261.2	63.2	627	63.2	6817	4.15	331.3	268.8
3KE044 L 312	79	13.5	1557	3.43	0.03	18.14	0.68	10.58	16.65	1.69	50.6	15.98	172.66	55.98	218.4	51.4	526	51.7	6864	3.47	236.1	205.6
3KE044 L 313	172	27.3	1650	7.40	0.06	11.41	0.60	11.41	20.90	3.41	65.6	20.13	206.66	65.05	248.0	56.7	592	56.9	6184	4.06	170.6	172.1
3KE044 L 314	187	30.2	1251	11.51	0.06	15.76	0.31	4.68	8.03	1.30	34.9	11.79	137.09	47.46	189.5	42.6	441	46.6	6294	6.00	466.4	309.0
3KE044 L 315	114	19.8	1051	8.40		34.88	0.35	3.67	6.93	0.93	28.1	9.52	119.67	37.87	157.9	39.7	405	40.5	6305	7.06	882.8	568.1
3KE044 L 318	173	26.3	2129	8.88	0.07	16.59	0.96	11.24	19.34	2.99	75.2	24.17	250.99	80.31	300.7	71.0	686	65.6	7554	7.39	386.0	393.7
3KE044 L 320	112	13.5	2439	19.23		45.67	0.63	9.85	14.76	1.99	72.8	22.37	273.50	86.70	339.4	79.5	808	79.7	5229	8.41	460.7	338.1
3KE044 L 321	202	32.2	1194	10.41	0.01	9.95	0.14	3.78	6.60	2.17	26.3	9.42	114.67	40.86	184.7	46.2	509	56.6	7082	6.78	323.3	408.8
3KE044 L 322																						
3KE044 L 323	207	29.1	1039	11.76		22.07	0.27	4.61	6.97	0.89	25.8	9.52	113.07	37.60	156.4	39.1	423	42.4	7824	9.33	322.8	334.7
3KE044 L 324	186	25.2	1872	12.61	0.10	22.68	0.94	12.09	13.75	1.20	59.3	19.55	222.05	71.41	279.1	65.1	625	60.3	8674	11.18	412.9	382.8
3KE044 L 325	178	13.1	2579	18.69	0.18	38.87	0.88	17.05	28.64	2.98	100.9	31.08	333.39	97.02	371.2	79.2	782	74.6	7722	11.32	388.8	311.0
3KE044 L 326	80	9.9	490	5.43		11.41	0.09	1.06	2.56	0.26	7.5	3.28	43.52	17.35	78.3	21.3	238	24.7	8151	5.31	117.0	134.8
>10% discordant																						
3KE044 L 262	130	19.2	1124	8.29	0.07	38.64	0.17	3.20	4.07	0.73	18.0	6.57	82.47	31.12	148.2	40.4	433	58.5	10492	3.90	557.2	102.7

3KE044 L 272	176	16.0	1959	12.20	0.13	47.23	0.58	9.70	18.70	2.70	70.2	21.79	230.22	74.09	287.3	62.1	594	67.2	6632	8.80	1489.2	535.0
3KE044 L 274	73	18.8	224	0.88		4.51		0.29	1.06	0.53	3.6	1.40	18.42	6.99	33.7	9.9	112	13.3	7936	1.24	88.8	37.9
3KE044 L 275	101	11.5	461	6.79	0.04	12.25	0.15	1.09	3.78	0.42	15.3	4.67	54.06	17.58	72.5	16.1	152	17.1	7204	5.49	179.5	132.9
3KE044 L 276	101	16.7	1026	3.21		16.31	0.27	2.72	5.75	1.52	22.7	8.54	100.45	35.17	151.9	39.0	405	46.7	8714	3.11	929.3	196.8
3KE044 L 279	65	10.8	228	2.62	0.03	6.28		0.58	1.27	0.33	5.0	1.72	22.75	7.98	36.0	10.2	110	12.7	8636	2.67	182.8	112.2
3KE044 L 280	106	11.5	655	8.53		15.99	0.05	1.64	3.19	0.37	12.3	4.60	65.51	22.59	103.9	26.5	304	32.7	14511	9.31	344.6	344.6
3KE044 L 282	113	14.8	2226	10.26	0.18	40.67	1.40	18.05	25.65	3.04	93.0	28.84	274.06	91.92	349.7	81.5	803	77.6	6213	4.72	489.1	328.3
3KE044 L 283	191	25.9	931	5.48	0.01	10.20	0.25	3.49	6.56	1.26	27.9	9.52	110.58	35.83	138.2	32.4	336	35.8	6586	3.42	237.1	193.5
3KE044 L 285	76	14.2	164	3.91		8.70		0.10	0.32	0.03	2.4	0.96	11.12	4.80	23.9	7.0	88	11.0	8996	3.06	34.5	21.8
3KE044 L 294	89	15.0	391	2.21		4.51	0.03	1.26	2.34	0.48	12.3	4.92	42.88	17.03	65.5	15.7	155	19.1	9014	1.87	81.5	54.6
3KE044 L 297	94	16.0	227	3.36		10.83		0.54	0.46	0.11	3.0	1.23	17.48	6.67	34.7	9.0	110	13.8	10767	3.50	62.0	36.7
3KE044 L 298	99	11.6	490	1.51		6.96	0.09	1.15	2.78	0.61	14.1	4.25	48.76	18.06	76.0	17.9	187	21.5	6879	1.60	69.3	78.4
3KE044 L 299	128	12.0	1657	3.97	0.07	13.45	0.62	9.14	13.58	1.38	57.0	16.79	191.04	63.26	245.6	58.1	512	55.9	7848	4.22	181.7	172.2
3KE044 L 302	107	23.4	1332	9.61	0.03	53.69	0.21	3.37	5.32	1.68	29.8	9.72	117.46	43.46	189.4	48.0	502	55.7	6879	6.11	1399.7	341.0
3KE044 L 305	90	10.7	434	1.81		6.88	0.04	1.87	2.23	0.73	10.8	3.42	45.68	15.78	66.0	16.5	173	19.3	5708	1.89	45.1	60.8
3KE044 L 307	170	17.6	1381	10.27	0.05	35.18	0.29	6.01	11.96	1.47	48.3	14.90	163.54	52.11	201.4	46.4	470	45.4	5624	6.84	1305.7	500.7

Analysis	P	Ti	Y	Nb	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	Th	U
3KE044 L 308	185	13.9	3488	19.18	0.24	52.85	1.06	22.48	33.81	4.96	139.5	40.09	426.15	134.00	523.9	116.5	1147	113.8	5624	9.07	660.7	423.6
3KE044 L 316	86	11.5	364	1.99		4.64	0.08	1.42	2.96	0.48	9.8	3.71	37.62	13.26	55.3	14.4	158	16.1	5007	1.67	36.7	53.7
3KE044 L 317	98	23.3	432	2.76		5.11	0.04	0.73	2.23	0.59	12.4	4.36	45.59	15.90	64.1	17.1	183	20.0	7184	2.53	77.4	105.0
3KE044 L 319	91	13.5	994	7.97	0.04	15.54	0.14	3.42	5.26	0.81	25.2	7.52	100.00	36.93	146.8	37.5	404	41.4	5371	4.62	116.5	146.1
09RL762																						
<10% discordant																						
09RL762 L 1274		9.0	892	4.23		5.75	0.03	1.93	3.02	0.23	24.5	6.79	86.34	32.19	134.4	29.8	269	49.4	10689	2.47	76.3	96.5
09RL762 L 2																						
09RL762 L 3541		5.0	1595	4.26		1.44	0.06	0.48	2.02		20.6	8.93	132.23	53.59	273.9	61.2	573	105.1	12626	2.80	47.3	250.6
09RL762 L 4451		5.7	1267	3.65		1.85	0.04	0.54	2.19	0.06	21.0	7.84	111.80	42.91	208.0	50.2	476	84.1	12956	3.00	41.9	177.4
09RL762 L 5602		12.4	1876	2.20		2.59	0.14	3.57	7.97	0.16	55.5	17.16	198.17	66.84	276.6	57.4	511	88.7	10809	1.23	101.8	139.3
09RL762 L 8																						
09RL762 L 11																						
09RL762 L 15	221	7.4	841	4.79		6.56	0.00	0.84	3.33	0.12	15.8	6.42	76.33	31.09	132.4	27.0	268	46.5	12079	2.61	84.7	141.0
09RL762 L 16																						

09RL762 L 17																						
09RL762 L 18																						
09RL762 L 20	481	5.0	1472	6.50		5.13	0.07	1.46	4.19		23.2	9.33	125.94	53.16	251.2	58.5	553	96.3	12878	4.30	90.3	270.4
09RL762 L 22	239	12.4	846	5.39		6.42	0.12	1.46	5.12	0.59	24.8	7.52	87.03	30.52	127.3	28.5	241	41.0	9716	2.50	78.5	88.6
09RL762 L 23																						
09RL762 L 27	456	8.7	1171	2.73		2.46	0.02	0.61	2.84		21.3	7.90	105.34	41.12	180.5	43.9	411	60.0	10639	1.74	50.5	152.1
09RL762 L 28																						
09RL762 L 29																						
09RL762 L 32	522	3.3	1746	8.83		4.57	0.10	1.43	3.23	0.26	22.7	10.52	147.93	63.45	305.1	74.0	723	113.8	11205	6.63	125.4	483.3
09RL762 L 34																						
09RL762 L 36	642	4.0	1658	5.94		1.69		0.48	1.98		19.4	9.53	146.47	60.41	290.1	70.4	696	108.0	11562	3.49	50.1	354.8
09RL762 L 37	418	3.4	1527	20.38		6.09	0.03	1.11	3.69		25.9	9.71	131.80	54.45	249.7	60.9	588	84.1	10914	10.81	180.5	619.3
09RL762 L 40	360	3.4	963	7.43		4.74		0.69	1.54	0.11	13.2	6.07	87.57	33.42	156.8	38.9	394	57.4	9760	5.13	70.8	285.7
09RL762 L 41	1041	3.7	2436	8.14		1.37	0.01	0.80	3.25		30.0	13.57	208.85	83.91	401.2	104.5	1046	153.1	11007	5.05	61.0	522.1
09RL762 L 43	722	6.0	1808	5.45	0.50	2.43	0.19	1.80	3.83	0.13	24.0	11.37	154.97	63.69	286.9	73.4	738	100.8	10560	3.25	57.7	336.9
09RL762 L 44																						

09RL762 L 45																					
09RL762 L 48																					
09RL762 L 52	592	6.5	1834	7.89	3.45		0.86	3.23	0.07	31.6	11.76	171.64	64.28	294.3	65.2	594	107.2	15781	5.06	133.9	373.2
09RL762 L 53	819	3.1	2488	10.06	2.76		0.54	3.79		30.5	13.52	211.04	88.43	441.0	100.5	947	174.3	14825	6.44	101.3	541.4
09RL762 L 54	738	6.4	2130	6.65	2.82		0.79	3.82	0.09	28.9	13.88	187.80	76.83	371.2	83.2	761	140.3	15095	4.32	90.3	368.5
09RL762 L 55	860	4.2	2471	8.60	1.49		0.80	2.71	0.11	27.2	13.22	195.58	87.52	443.2	108.8	1040	190.1	15825	6.24	70.0	526.2
09RL762 L 56	479	11.0	3567	8.79	16.96	0.85	12.23	20.01	0.87	98.3	32.23	346.08	119.79	510.9	105.7	904	151.5	13558	6.34	606.5	567.4
09RL762 L 58	479	5.2	1669	4.97	5.26	0.26	4.64	7.21	0.97	39.8	13.00	154.37	55.89	258.3	60.6	548	101.4	14232	2.52	164.5	251.5
09RL762 L 59	428	5.4	1308	5.31	5.08	0.08	1.14	2.07		20.9	8.92	110.67	45.84	214.0	49.4	469	82.5	13352	3.77	80.8	245.9
09RL762 L 60																					
09RL762 L 61																					
09RL762 L 65	597	5.8	1827	6.75	2.32		0.85	3.84	0.09	24.2	10.73	154.32	63.53	289.8	71.4	671	114.8	12898	4.49	58.8	294.7
09RL762 L 67																					
09RL762 L 73	159	8.1	736	3.94	6.14	0.07	2.51	2.85	0.22	15.8	6.51	72.48	24.89	109.9	23.9	245	38.0	10204	2.15	64.7	149.5
09RL762 L 75	793	5.5	2209	11.59	3.69		1.30	2.54		25.8	13.41	195.92	80.55	381.2	95.9	952	144.8	12148	6.64	100.6	589.0
09RL762 L 80	765	4.5	1985	9.36	2.36	0.05	0.35	4.21		22.8	11.44	172.45	71.96	340.8	82.8	826	116.7	11823	5.51	69.8	456.5

09RL762 L 82	186	8.9	641	3.86		6.97	0.04	0.53	2.67	0.27	18.8	6.40	67.63	23.39	97.8	24.9	228	31.8	9062	2.47	64.3	109.6
09RL762 L 83																						
09RL762 L 84																						
09RL762 L 86	945	11.4	2713	3.37		2.49	0.11	3.93	13.93	0.40	74.1	25.81	297.20	104.69	405.5	91.9	916	114.7	9874	1.61	107.4	262.8
09RL762 L 87	585	9.2	1423	4.48		2.29	0.01	1.91	3.51	0.12	24.1	11.14	138.46	53.90	234.9	56.1	575	80.4	11118	2.87	57.4	227.1
09RL762 L 89																						
09RL762 s 90																						
09RL762 s 95																						
09RL762 s 101	689	9.3	2058	6.41		5.35	0.18	2.99	6.00	0.15	43.8	16.13	209.85	78.55	331.2	86.4	799	118.3	12173	3.66	136.3	379.3
09RL762 s 102																						
09RL762 s 105	716	9.2	3035	8.84	0.03	13.30	0.95	16.55	28.61	1.81	137.7	35.30	392.95	131.65	497.8	113.8	1061	140.8	13929	4.37	487.5	440.1
09RL762 s 106	845	4.3	2852	10.08		2.75	0.14	2.30	8.58	0.29	55.5	23.76	311.84	114.58	486.9	122.7	1143	164.4	15050	5.52	192.0	598.5
09RL762 s 107																						
09RL762 s 108																						
09RL762 s 109																						
09RL762 s 110																						
09RL762 s 111	875	10.2	3434	5.53	0.48	8.33	0.49	8.71	18.12	0.46	110.3	34.15	400.18	133.54	567.8	134.5	1220	166.0	14917	4.11	314.2	586.0

09RL762 s 112																						
09RL762 s 113	442	11.7	3864	25.19	0.20	18.47	1.04	20.39	34.02	3.53	156.6	47.86	526.76	169.23	657.7	145.6	1234	187.3	13992	9.45	499.0	608.0
09RL762 s 115	750	9.9	2313	4.89		2.50	0.14	1.67	7.15	0.16	43.2	17.26	241.05	93.17	418.7	86.9	940	138.6	17644	3.90	97.3	368.8
09RL762 s 116																						
09RL762 s 119																						
09RL762 s 121	931	5.8	2802	7.89		2.55	0.07	1.33	5.07	0.14	41.4	19.04	274.32	112.16	526.9	135.3	1346	200.3	15802	6.82	100.0	630.2
09RL762 s 122	426	7.5	1360	9.92	0.02	7.81	0.07	0.79	4.04	0.19	23.6	10.29	140.01	53.73	258.4	62.0	636	94.9	14200	6.12	115.6	479.1
09RL762 s 123																						
09RL762 s 125	427	8.8	1402	6.99		6.35	0.13	2.76	7.00	0.22	40.7	14.48	162.13	53.73	227.4	54.3	509	75.8	13981	4.77	117.2	324.3
09RL762 s 126	609	7.2	2202	7.70	0.05	5.96	0.18	2.72	7.72	0.36	50.6	17.10	224.13	86.61	393.6	92.7	913	127.8	14643	5.09	201.0	553.1
09RL762 s 128																						
09RL762 s 129	284	6.0	1718	8.45		27.61	0.45	9.21	15.81	0.87	65.4	18.93	212.62	69.77	272.0	62.0	597	82.3	12166	4.89	494.0	379.3
09RL762 s 131																						
09RL762 s 132	530	3.6	1630	7.09		5.83	0.26	3.60	8.86	0.13	44.0	14.04	165.94	57.35	257.0	60.3	616	85.6	10017	3.93	235.9	331.4
09RL762 s 133																						
09RL762 s 135																						

09RL762 s 136	282	3.6	591	5.49	0.01	3.68		0.06	1.98		6.8	3.55	49.06	19.54	98.1	24.4	257	37.0	9861	3.77	40.0	201.5
09RL762 s 139																						
09RL762 s 140																						
09RL762 s 142	1059	4.8	2951	4.23		1.98	0.03	1.96	6.74	0.12	43.3	19.58	261.95	97.54	449.8	104.9	1038	145.3	9908	3.08	85.4	384.7
09RL762 s 143	375	14.7	1053	2.76		4.34	0.12	2.33	6.93	0.36	34.5	10.86	114.69	39.72	151.5	33.6	318	46.2	8315	1.13	87.7	91.4
09RL762 s 144	416	9.0	1336	2.99		5.81	0.15	4.64	8.15	0.33	44.9	13.19	147.56	48.15	186.2	40.8	370	52.7	8698	1.33	118.4	109.4
09RL762 s 147	434	5.2	1594	4.46		8.51	0.21	4.40	8.36	0.58	49.0	16.15	170.95	59.39	237.2	50.1	450	68.6	9259	2.55	182.9	188.1
09RL762 s 148	413	6.1	1143	6.49		6.89	0.05	1.13	4.45	0.00	21.5	8.33	108.73	41.46	178.0	41.2	401	64.2	10564	3.57	118.5	265.1
09RL762 s 149	343	12.9	989	2.03	0.03	4.19	0.19	3.42	6.55	0.33	30.8	9.36	109.13	37.39	151.1	34.1	300	46.9	10443	1.19	84.0	89.1
09RL762 s 155	663	2.9	1941	5.25		3.60	0.17	2.79	5.36	0.21	29.8	12.73	162.30	65.51	308.0	68.3	622	110.2	12069	3.21	154.7	299.0
>10% discordant																						
09RL762 L 7																						
09RL762 L 12	450	4.8	1631	3.68	0.20	6.86	0.89	12.59	16.07	1.36	67.6	18.54	176.92	59.21	238.9	49.6	439	77.3	10938	1.87	211.0	151.8
09RL762 L 13	621	2.9	1972	6.50		3.09	0.01	1.15	3.62	0.06	29.8	11.66	168.20	66.64	319.0	70.3	664	125.5	13696	4.85	102.1	363.5
09RL762 L 19	425	3.1	1256	9.71		3.40	0.06	1.07	2.38	0.06	19.1	7.86	110.27	44.76	212.5	47.0	468	80.3	14073	6.16	80.3	279.8
09RL762 L 21																						

09RL762 L 26																						
09RL762 L 31																						
09RL762 L 33	333	5.4	810	4.05		1.93	0.03	0.84	1.90	0.09	13.1	5.90	74.62	29.22	140.2	31.8	330	48.8	11772	2.06	38.3	187.7
09RL762 L 42	883	4.5	2207	10.98	0.26	4.54	0.21	2.39	4.51	0.05	28.6	14.52	188.79	78.22	362.2	95.5	943	136.5	10595	6.04	106.7	570.9
09RL762 L 47	651	5.5	1503	6.21		4.00		1.43	3.24		27.4	10.30	139.71	52.53	242.1	59.4	591	84.3	10095	3.67	82.5	314.5
09RL762 L 49																						
09RL762 L 51	174	17.1	942	2.37	0.04	5.85	0.51	6.81	7.86	1.35	37.5	10.09	107.74	35.33	144.4	28.9	247	45.4	10001	1.01	71.2	66.7
09RL762 L 63																						
09RL762 L 68																						
09RL762 L 74																						
09RL762 L 81																						
09RL762 L 85																						
09RL762 s 91																						
09RL762 s 93	520	3.4	1364	9.06		4.82		0.39	2.27	0.12	18.9	8.33	125.86	49.26	236.5	62.0	624	89.4	11529	6.52	75.0	387.1
09RL762 s 96	282	4.1	666	9.27		4.25		0.33	1.64		8.4	3.88	55.80	21.11	109.2	28.1	280	43.3	11780	6.72	53.8	310.4
09RL762 s 97	792	4.5	2136	5.60		1.58	0.02	0.86	4.19	0.10	25.1	13.06	179.91	74.20	358.7	89.2	933	135.9	12134	4.16	65.1	423.8

09RL762 s 98	321	10.2	1142	6.18		10.08	0.12	3.58	6.15	0.28	31.3	10.73	117.62	41.27	175.4	41.2	370	50.8	9744	3.61	130.7	194.4
09RL762 s 99	334	6.1	966	7.03		7.83	0.06	0.60	2.93	0.05	16.1	7.49	93.70	33.78	151.8	39.8	392	57.3	11231	3.85	97.8	254.4
09RL762 s 100																						
09RL762 s 103	492	13.5	1813	4.81		8.36	0.43	9.28	16.68	0.66	75.1	19.23	207.76	68.25	259.8	56.0	516	71.3	9624	2.61	194.1	184.7
09RL762 s 118	583	6.3	2989	7.36	0.02	10.58	0.24	6.63	13.09	0.77	69.2	25.18	322.59	121.85	528.3	119.6	1075	177.9	15560	5.49	326.0	757.3
09RL762 s 120	241	6.0	2875	8.15	0.00	20.27	0.58	9.42	17.95	1.57	98.8	30.68	338.82	120.05	487.8	100.7	857	154.3	14576	4.86	436.6	504.3
09RL762 s 124																						
09RL762 s 127																						
09RL762 s 130	535	6.5	2159	7.69		14.63	0.29	5.51	11.53	0.83	57.4	20.76	226.68	85.65	377.4	87.0	826	119.0	13006	5.69	363.8	468.4
09RL762 s 138																						
09RL762 s 145	190	7.1	1888	7.43		9.80	0.79	12.85	18.17	3.68	76.1	21.65	226.89	71.01	274.0	60.0	539	77.8	7570	3.38	145.1	196.3
09RL762 s 151	480	13.4	1695	4.14	0.04	4.66	0.22	4.80	8.72	0.35	52.8	15.38	177.74	62.56	243.4	52.9	456	75.8	9487	1.87	147.5	166.2
09RL762 s 152	861	3.7	2184	6.60	0.04	1.35	0.07	0.80	2.78	0.05	27.2	13.18	190.15	75.11	354.8	82.9	823	133.5	11271	3.96	62.2	380.2
Analysis	**P**	**Ti**	**Y**	**Nb**	**La**	**Ce**	**Pr**	**Nd**	**Sm**	**Eu**	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**	**Hf**	**Ta**	**Th**	**U**

15VI003

<10% discordant

15VI003 M 501	126	6.9	2115	31.29	0.04	38.93	0.58	13.59	23.50	3.82	99.7	28.04	294.33	89.77	318.2	69.5	652	66.5	5077	9.51	193.4	308.8
15VI003 M 502	163	10.8	1445	26.37	0.10	35.49	0.41	7.80	14.81	2.39	59.2	18.12	184.75	59.43	211.4	46.9	467	49.0	5090	10.01	331.0	367.6
15VI003 M 503	148	11.2	1017	14.58		18.86	0.31	4.45	7.91	1.32	38.5	12.23	131.02	40.36	147.6	34.2	319	32.0	5052	6.60	251.2	269.1
15VI003 M 505	151	5.0	1226	32.21	0.35	41.09	0.43	5.31	10.09	1.84	45.1	14.95	164.60	50.74	179.7	38.2	367	37.1	5307	11.20	233.3	320.1
15VI003 M 506	189	9.7	4043	41.74	0.13	58.61	1.78	33.94	56.73	9.02	201.6	56.14	548.17	164.92	576.7	125.5	1165	114.1	5346	12.39	482.8	505.7
15VI003 M 510	184	6.3	2951	27.85	2.80	37.24	2.02	28.65	41.08	6.33	143.4	40.36	409.20	123.56	440.1	90.8	863	85.0	5374	8.49	233.4	361.7
15VI003 M 513	195	11.5	2265	63.94	0.07	75.57	0.58	11.94	28.54	4.70	107.2	30.86	316.35	90.33	319.4	68.2	624	63.8	4825	20.41	778.0	659.0
15VI003 M 514	169	6.9	3825	41.70	0.32	57.33	1.84	34.84	59.68	8.98	197.8	56.33	561.76	163.99	584.7	123.8	1131	113.4	4871	10.24	311.3	425.2
15VI003 M 517																						
15VI003 M 518	132	7.2	1439	33.44		43.64	0.44	7.01	13.66	2.60	65.3	19.50	197.62	60.38	216.6	44.7	443	43.0	5122	12.46	265.8	329.5
15VI003 M 521	161	10.9	1533	31.25	0.03	25.55	0.31	5.14	10.99	1.54	45.1	14.92	173.82	60.90	231.0	52.8	503	52.6	5059	9.59	289.8	347.5
15VI003 M 522																						
15VI003 M 523	120	6.3	2599	25.30	0.13	35.23	1.03	18.09	33.63	5.43	117.5	34.93	363.40	110.73	394.4	84.5	778	80.7	4957	7.21	210.9	315.4
15VI003 M 524	162	9.9	2710	69.17	0.07	109.58	0.74	15.91	31.96	5.61	139.5	40.42	388.37	113.75	395.2	81.3	737	74.2	4775	20.91	809.2	695.5
15VI003 M 525	192	7.9	1776	29.95	0.01	49.74	0.48	8.62	14.92	3.14	72.1	21.82	238.05	72.25	260.8	55.1	511	53.8	5691	10.98	666.6	466.6

15VI003 M 527	151	8.3	3127	30.43	0.19	45.25	1.39	31.56	42.48	6.75	159.7	45.01	442.98	133.42	469.1	100.3	912	94.8	5488	9.86	299.0	383.9
15VI003 M 530																						
15VI003 M 531	233	6.2	3288	73.79	6.99	115.08	2.85	27.17	40.45	6.32	161.8	47.28	457.33	137.70	485.8	103.2	944	94.0	5579	20.51	756.4	745.9
15VI003 M 533	142	5.6	1739	34.13		49.83	0.40	6.33	14.74	1.76	68.6	21.73	230.54	71.52	255.3	54.4	506	52.3	6304	11.83	437.8	451.1
15VI003 M 536																						
15VI003 M 537																						
15VI003 M 540	142	9.5	1583	19.21	0.16	17.75	0.42	7.31	14.91	2.50	56.2	18.36	197.70	63.21	233.8	51.7	494	55.0	5591	6.00	158.6	233.2
15VI003 M 543	171	7.6	2627	55.22	0.10	76.74	0.81	14.58	28.70	4.86	125.2	37.53	372.50	108.63	391.9	79.5	710	79.0	5453	18.97	536.8	538.2
15VI003 M 544	144	5.5	4186	38.03	0.12	55.22	1.31	30.90	56.75	9.52	203.3	59.93	596.50	177.66	618.4	130.7	1186	122.6	5511	10.26	335.5	410.9
15VI003 M 545	131	6.2	2671	25.49	0.10	31.32	0.92	18.30	31.17	5.63	122.1	36.35	366.18	107.75	407.5	84.4	765	84.0	5438	6.82	170.1	246.7
15VI003 M 547	153	6.8	2488	55.06	0.06	88.86	0.59	10.90	27.36	5.17	116.8	35.20	341.93	102.36	364.1	76.3	647	71.3	5375	19.31	608.4	589.3
15VI003 S 559	160	7.1	3571	41.75	0.63	52.24	2.39	33.53	52.82	7.72	176.5	50.09	506.82	150.03	528.4	110.2	1034	108.0	5526	9.90	324.5	381.7
15VI003 S 563																						
15VI003 S 568	331	10.5	2992	94.41	0.57	93.89	0.66	12.23	27.44	6.32	137.2	42.33	409.51	116.20	401.8	79.1	674	79.8	7131	24.55	1740.5	635.0
15VI003 S 575																						
15VI003 S 576																						

15VI003 S 580	183	10.5	2239	41.42	0.06	50.81	0.47	9.83	18.93	2.91	90.7	28.26	284.50	87.90	310.5	63.8	538	68.5	6662	15.38	575.9	422.5
15VI003 S 591	171	8.0	3175	60.55	0.09	89.24	0.61	12.93	28.92	4.79	133.7	39.72	412.85	127.36	455.4	91.8	749	102.4	7465	21.39	415.5	423.3
15VI003 S 596	259	14.4	5403	66.11	0.28	60.94	1.85	38.49	57.38	7.92	244.5	71.37	701.14	210.12	760.0	147.6	1252	161.2	7232	15.58	828.9	523.3
15VI003 S 597	190	14.7	2376	34.89	0.06	40.90	0.57	10.01	20.59	3.08	97.1	27.42	293.01	87.78	336.6	68.7	563	78.0	7133	13.18	540.1	389.3
15VI003 S 600	168	8.9	2272	41.71	0.06	57.37	0.60	9.61	20.83	3.12	94.5	28.82	297.93	89.47	326.7	64.7	562	72.3	6531	14.63	322.4	340.7
15VI003 S 605																						
15VI003 S 606	325	14.8	2982	39.67	0.34	46.49	1.14	19.47	31.85	4.36	129.5	38.17	390.00	115.08	415.3	90.1	833	88.9	5927	11.64	808.5	500.1
15VI003 S 608	235	13.6	2842	76.10	0.10	89.93	0.91	15.37	36.21	4.98	142.9	41.19	399.21	112.54	393.2	79.7	728	76.2	5316	23.10	1645.7	959.0
15VI003 S 609	221	8.4	4000	33.45	0.17	44.41	1.82	34.90	52.40	8.21	192.7	55.99	555.63	161.77	580.4	122.2	1101	118.0	5586	9.75	335.0	392.9
15VI003 S 611																						
15VI003 S 613	187	4.7	5366	54.94	0.32	88.08	2.19	41.08	61.66	8.87	235.5	71.67	756.29	217.95	781.8	163.1	1423	148.9	5609	13.28	511.4	615.5
15VI003 S 614	135	8.0	2210	30.46	0.20	28.71	0.54	9.52	19.88	3.50	81.7	25.20	267.46	87.79	327.5	68.9	642	70.8	5626	7.56	190.8	276.0
15VI003 S 618																						
15VI003 S 624	243	10.4	3566	31.61	0.11	57.56	1.07	20.04	36.76	5.30	148.4	42.79	451.00	140.31	504.0	103.4	855	115.2	7604	11.48	572.7	348.6
15VI003 S 626	138	8.1	1638	28.55	0.02	36.71	0.33	6.55	13.98	2.32	61.2	19.37	196.44	62.19	232.5	49.0	403	53.0	6881	10.97	308.3	282.1
15VI003 S 6a10																						

>10% discordant

15VI003 M 515		185	10.6	1936	43.63	0.04	63.46	0.69	10.00	22.62	3.55	89.5	27.07	261.80	79.39	286.3	58.9	551	55.7	5050	16.43	605.3 548.8
15VI003 M 516																						
15VI003 M 541																						
15VI003 M 542		118	10.2	1076	14.27	0.05	11.54	0.32	5.39	10.41	1.66	39.1	12.31	129.59	42.24	164.4	37.5	360	40.5	6020	5.50	68.0 144.7
15VI003 S 569		172	4.3	1321	34.14	0.07	50.65	0.28	4.36	8.94	1.46	45.6	14.53	156.63	51.03	189.3	40.5	387	43.4	8250	13.28	203.3 241.5
15VI003 S 571		139	8.9	2722	28.46	0.20	28.87	0.86	16.28	29.99	4.38	119.0	34.77	354.15	107.04	395.6	82.6	718	84.5	5851	9.31	227.1 289.0
15VI003 S 579		145	10.1	1875	29.49	0.72	37.36	0.47	7.30	13.38	2.57	69.7	21.95	225.15	71.03	267.7	55.6	474	60.7	6680	10.81	337.5 297.9
15VI003 S 582		270	12.6	5190	96.63	0.19	120.72	1.53	30.54	52.16	9.22	233.5	68.68	689.71	206.37	703.7	138.4	1089	139.5	6612	22.63	1475.6785.2
15VI003 S 607																						
15VI003 S 622		176	8.4	3754	97.04	0.32	129.72	0.91	14.30	34.79	5.31	158.0	47.29	491.73	147.21	552.9	110.0	919	117.0	6157	27.74	428.6 582.5
15VI003 S 625																						

Analysis	P	Ti	Y	Nb	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	Th	U
DG-1																						
<10% discordant																						
DG1 L 211910.3		1772	6.08		13.30	0.58	12.57	20.61	1.15	73.3	22.32	230.06	70.59	265.1	55.2	504	65.0	9184	3.19	76.5	81.1	

DG1 L 3	140	9.0	850	11.16		14.95	0.15	2.84	5.49	0.45	24.9	8.49	97.11	32.31	128.0	29.5	285	37.3	9699	5.85	59.9	87.5
DG1 L 4	141	12.6	1435	5.24	0.22	12.74	0.52	10.99	19.00	0.89	57.2	18.78	190.04	56.98	209.5	44.5	412	51.7	8770	2.77	66.2	67.7
DG1 L 6	199	10.2	1656	7.87	2.40	18.25	1.18	13.54	17.03	1.06	66.9	20.70	209.54	65.07	246.5	53.1	491	59.5	8788	3.78	81.8	95.0
DG1 L 7	211	16.6	610	0.60		9.48		1.41	2.70	0.54	13.8	4.17	56.60	20.19	91.0	25.3	268	38.7	9858	0.55	50.9	71.4
DG1 L 8	264	14.8	829	2.93		12.98	0.03	0.69	1.93	0.24	15.7	6.28	79.14	30.53	132.5	35.6	377	49.4	10867	1.59	45.2	80.5
DG1 L 9	287	27.3	805	1.56	0.01	21.23	0.06	1.86	3.53	0.96	19.6	6.81	80.20	28.19	128.0	32.4	345	42.2	9444	0.78	59.7	61.8
DG1 L 10	204	29.0	1095	0.50		6.91	0.27	5.56	12.45	2.34	41.1	12.75	141.18	41.45	163.4	37.3	387	44.4	7155	0.34	30.2	42.4
DG1 L 11	272	30.5	663	0.69		4.99	0.06	1.83	4.61	1.05	17.7	6.01	73.12	25.58	92.2	23.8	231	27.8	7030	0.49	17.8	29.4
DG1 L 12	131	15.1	449	4.55		7.50	0.08	1.91	4.31	0.31	16.6	5.23	55.87	17.50	70.3	16.5	178	19.2	6338	2.33	24.3	43.7
DG1 L 13	203	7.8	1734	2.23	0.03	10.35	0.34	7.15	15.57	1.24	59.9	19.74	209.92	67.66	253.5	59.8	572	58.0	6327	1.05	30.7	61.1
DG1 L 14	231	9.6	1041	3.59		10.24	0.15	2.98	6.19	0.41	28.8	10.22	116.89	40.53	158.2	39.0	389	41.3	6070	1.59	25.1	56.8
DG1 L 16	329	18.2	938	0.78		4.83	0.05	1.24	2.59	1.22	14.8	5.85	81.58	32.12	160.3	43.9	524	64.5	6535	0.37	28.7	55.2
DG1 L 18	281	4.6	791	3.08		21.65		0.45	1.74	0.42	14.5	5.05	73.01	28.53	130.6	35.0	416	48.4	9231	1.17	119.2	118.1
DG1 L 19	131	12.6	747	7.19		10.25	0.19	4.27	7.68	0.74	27.6	8.75	90.60	29.86	112.0	25.4	267	27.0	6235	3.68	40.8	66.2
DG1 L 20	104	6.8	2084	21.76	0.09	26.64	0.67	10.65	22.28	1.08	89.9	26.62	293.13	81.55	304.5	67.2	671	61.8	5857	7.88	150.0	211.6
DG1 L 22	128	12.7	901	6.78		10.13	0.38	6.63	9.89	0.68	33.6	10.86	114.81	37.36	134.2	33.1	315	34.3	6095	3.39	40.6	73.2
DG1 L 23	302	13.5	890	3.50	0.01	16.03	0.06	1.62	2.32	0.30	16.6	6.89	84.74	33.12	142.9	36.2	421	48.6	9149	1.82	63.8	124.0
DG1 L 24	265	9.3	960	5.98		19.91	0.05	1.00	3.17	0.24	14.8	6.30	87.21	33.49	148.5	42.0	505	55.1	9496	3.47	111.6	255.2
DG1 L 25	136	13.1	661	4.78		7.80	0.12	2.80	5.37	0.61	23.0	7.71	79.70	26.24	100.3	22.9	221	26.0	7665	2.56	27.7	40.1

DG1 L 26	111	9.4	1479	6.52	0.49	14.00	0.53	10.85	17.25	1.04	60.7	18.19	195.37	57.49	219.1	48.4	454	51.6	7974	3.79	71.2	92.0
DG1 L 27	170	20.4	1755	1.49		3.93	0.60	10.12	15.08	1.14	59.4	19.64	212.45	68.89	259.9	58.0	567	65.2	8443	0.72	56.9	70.5
DG1 L 29	266	10.7	878	9.22		36.39	0.02	0.69	2.68	0.34	16.0	6.80	83.42	32.40	148.8	39.7	431	53.0	10922	4.24	189.2	147.9
DG1 L 30	118	12.7	813	7.35	0.03	12.38	0.16	4.89	8.92	0.45	29.2	9.18	103.20	30.99	123.1	29.0	282	30.1	6656	3.46	55.9	81.5
DG1 L 31	304	31.3	1189	0.88	0.00	16.50	0.50	6.45	12.80	1.67	44.8	12.48	136.46	43.96	165.3	37.9	400	42.3	7852	0.44	222.6	224.6
DG1 L 33	128	10.9	594	7.85		11.11	0.17	2.25	4.76	0.46	21.7	6.57	73.10	24.04	87.8	20.6	217	24.2	6516	4.00	39.7	74.5
DG1 L 34	107	5.0	748	6.62		14.99	0.02	0.73	2.75		18.2	6.40	79.16	28.91	124.5	30.4	330	33.8	8705	2.45	85.7	318.6
DG1 L 35	211	4.1	1191	18.67		14.26	0.08	1.42	3.51		22.1	8.03	116.41	45.95	198.4	50.9	547	59.4	10030	6.71	84.1	350.2
DG1 L 36	114	5.3	227	1.12		5.74	0.00	0.62	1.00	0.20	4.2	1.97	21.11	8.31	37.1	9.1	109	12.7	8170	0.39	23.6	32.7
DG1 L 37	121	7.4	265	0.92		6.50		0.25	1.18	0.22	6.2	2.06	26.48	9.04	43.2	11.3	123	14.4	8695	0.59	34.3	43.5
DG1 L 40	121	23.4	294	0.35		2.65	0.07	1.45	2.63	0.19	7.6	2.55	29.50	11.20	44.9	11.7	132	16.1	6426	0.29	9.3	19.7
DG1 L 41	181	22.8	438	0.63		4.53	0.06	1.45	2.33	0.34	10.9	3.73	45.65	16.53	68.1	18.1	188	21.3	7266	0.31	38.4	54.0
DG1 L 42	133	6.6	925	16.03	0.03	21.11	0.27	4.05	8.40	1.88	38.6	11.00	116.30	37.32	134.0	31.6	305	30.6	5661	5.13	60.5	112.5
DG1 L 43	250	10.2	703	5.11		6.78	0.03	1.00	2.50	0.21	15.1	5.34	71.19	24.65	109.8	28.3	300	32.7	9579	2.26	35.5	103.6
DG1 L 44																						
DG1 L 45	138	13.1	1253	5.87		11.06	0.63	10.47	18.11	1.57	54.9	16.17	170.37	51.50	179.2	41.9	409	42.4	6650	2.19	59.5	77.1
DG1 S 46																						

DG1 S 50	956	13.5	2435	0.72	0.09	1.56	0.16	2.51	8.56	0.36	58.2	20.42	255.60	91.04	377.0	92.0	952	105.1	10799	0.57	67.2	296.4
DG1 S 52	138	5.8	3067	25.08	0.10	30.48	1.02	18.39	38.60	1.50	139.4	41.47	432.77	129.56	456.2	101.6	964	93.4	7040	8.58	194.7	271.2
DG1 S 53	370	10.5	1173	1.31		2.94	0.07	1.59	4.96	0.25	30.8	10.39	127.04	43.60	175.8	44.7	459	51.0	9024	0.90	97.6	253.6
DG1 S 55																						
DG1 S 56	282	21.1	858	2.58		28.52	0.02	0.87	3.74	1.10	17.1	5.75	83.93	29.94	138.6	37.3	428	49.6	9278	1.36	46.2	82.5
DG1 S 57	251	10.5	599	3.54		24.62	0.02	0.41	1.66	0.20	8.5	3.46	53.28	20.54	101.8	28.5	348	43.5	10076	1.74	46.8	98.8
DG1 S 59	165	18.8	446	4.41	1.71	10.27	0.49	4.80	4.59	0.46	16.4	4.82	51.53	16.73	65.3	15.4	168	18.0	6508	1.87	22.4	40.0
DG1 S 60	300	9.8	1040	6.06		27.74	0.04	0.95	3.30	0.62	16.8	6.99	97.47	38.11	170.5	47.9	562	67.5	9764	3.85	203.2	354.5
DG1 S 61	142	6.1	603	13.66	0.06	14.30	0.06	0.83	2.63	0.56	15.2	5.07	64.63	21.11	94.8	24.6	253	27.3	9575	7.54	52.7	156.5
DG1 S 62																						
DG1 S 65																						
DG1 S 67	294	26.9	1241	1.40		26.50	0.39	6.18	11.82	3.71	41.6	13.11	141.72	44.90	180.1	44.6	463	52.2	7357	0.71	94.7	121.0
DG1 S 68	153	11.1	1225	21.43	0.03	26.48	0.48	7.16	9.73	0.40	43.7	13.11	147.82	48.28	181.2	43.9	433	47.2	6598	8.40	169.5	192.6
DG1 S 70	248	13.4	904	0.84		9.57	0.09	1.24	4.89	0.99	17.9	6.21	82.04	30.32	135.9	36.0	414	51.6	8947	0.60	92.1	161.6
DG1 S 72																						
DG1 S 73																						
DG1 S 75																						
DG1 S 76	287	5.7	1660	1.95		7.88	0.15	2.93	9.52	0.44	38.6	13.06	170.97	61.23	249.1	58.3	594	71.1	9899	1.00	114.7	191.0
DG1 S 77	83	3.2	195	3.51		1.49				0.12	1.9	1.06	15.24	5.73	23.5	6.3	63	7.1	12626	3.12	5.7	405.7

DG1 S 78	555	22.9	3638	3.40	0.00	34.29	0.65	10.21	25.70	5.54	127.7	42.70	452.97	148.64	547.6	126.2	1186	125.7	8939	0.99	455.6	376.3
DG1 S 79	373	16.9	3015	3.77		97.01	0.93	18.33	27.47	4.85	102.2	31.06	350.60	108.33	436.9	96.8	1013	118.7	8534	1.55	210.1	149.7
DG1 S 80																						
DG1 S 81	149	16.2	531	4.18		8.55	0.06	1.62	3.00	0.37	17.1	5.57	59.89	20.95	77.6	17.3	181	22.0	7418	2.58	28.1	44.2
DG1 S 82	273	17.8	1396	1.11		11.33	0.08	1.47	5.46	1.16	33.2	10.43	139.41	50.83	217.7	54.6	571	66.8	9375	0.35	60.8	100.8
DG1 S 83	316	17.3	1968	0.84		15.10	0.44	6.19	10.91	2.89	46.1	18.04	211.62	73.23	299.0	72.2	770	87.1	8762	0.61	109.0	150.8
DG1 S 84																						
DG1 S 85	169	11.8	817	12.96	1.06	18.82	0.53	5.29	6.94	0.43	24.1	8.04	94.27	32.05	126.5	30.6	306	32.9	7533	6.24	60.8	105.5
DG1 S 86	143	15.0	541	7.32		11.31	0.10	1.85	3.80	0.64	16.3	6.22	67.49	20.22	86.4	19.2	207	23.3	7669	3.03	36.0	63.3
DG1 S 87	147	6.6	3621	99.81	1.11	61.35	0.78	12.68	30.63	1.54	129.9	44.63	483.60	152.76	537.6	121.7	1121	109.2	7523	24.43	332.6	536.5
DG1 S 89	182	5.2	985	20.74	1.87	24.17	0.69	6.05	6.60	1.63	32.5	10.85	116.20	38.39	148.6	32.8	326	33.7	6784	6.93	54.3	122.8
DG1 S 91																						
DG1 S 93	151	2.7	1655	62.62		29.47	0.12	2.83	6.70	0.79	46.5	16.05	197.04	66.11	249.4	56.9	536	51.6	7914	21.68	132.9	358.6
DG1 S 94																						
DG1 S 95	324	20.4	1600	19.58	0.63	17.33	0.56	8.56	13.14	1.50	49.3	17.82	182.88	59.81	232.6	56.5	570	61.2	8517	8.07	111.2	150.5
DG1 S 96	134	15.2	632	6.79		9.30	0.17	4.05	6.28	0.47	23.0	7.02	77.87	24.01	96.9	22.7	241	27.7	6740	4.12	27.9	59.0
DG1 S 97	156	18.1	1427	2.75		5.66	0.24	3.47	9.43	0.25	39.6	12.26	145.91	51.69	222.4	53.8	581	67.7	5678	0.97	189.9	207.3
DG1 S 98	196	5.2	2931	4.13	0.11	9.06	0.65	12.56	23.32	1.30	98.3	29.85	346.24	115.77	452.2	109.5	1212	136.9	5817	1.47	141.7	213.4

DG1 S 99	391	8.0	1442	3.29		33.15	0.23	3.96	9.79	2.82	39.1	12.67	151.00	53.32	203.7	50.9	565	59.5	8756	1.32	112.0	119.6
DG1 S 100	199	6.8	521	2.51		22.09		0.81	1.21	0.34	9.2	3.57	48.47	17.62	89.2	23.4	258	30.0	10025	1.12	62.5	103.5
DG1 S 103	686	8.1	2012	1.55		2.94	0.03	2.39	5.24	0.17	30.3	14.78	187.02	69.99	322.8	83.2	893	100.6	11166	1.12	88.1	437.1
DG1 S 106	358	20.6	1350	1.18		17.06	0.09	2.52	4.58	1.20	23.9	9.00	131.46	48.11	215.4	55.2	605	73.2	8561	0.55	40.7	50.6
DG1 S 109	237	10.5	1834	3.66		6.55	0.10	3.18	8.95	1.16	44.4	14.92	188.90	70.95	284.0	65.0	682	80.1	9156	2.22	188.7	273.4
DG1 S 110	526	17.9	1619	1.55	0.41	9.75	0.63	8.07	16.69	3.41	66.7	18.27	184.67	59.59	231.3	49.8	505	62.3	10078	0.68	129.4	256.6
DG1 S 111	189	16.0	507	5.50		8.92	0.10	2.00	3.41	0.49	15.3	5.11	56.50	18.65	73.2	18.1	188	20.3	7662	2.38	26.5	51.6
DG1 S 113	110	8.1	1726	37.92	0.01	59.02	0.28	7.82	13.94	3.50	63.2	20.83	220.68	68.69	256.5	57.7	551	56.6	5728	12.72	142.1	237.6
DG1 S 114	298	7.1	1969	2.84		9.60	0.26	5.68	10.25	0.79	46.9	18.35	212.54	72.41	285.2	68.4	703	78.3	9181	1.70	65.2	119.3
DG1 S 115																						
DG1 S 117	152	11.5	672	2.58		5.54	0.06	0.94	4.03	0.15	16.6	5.68	68.60	25.00	98.1	23.7	258	29.9	8424	1.15	37.1	161.1
DG1 S 120	351	14.2	996	4.15	0.08	30.34	0.07	1.22	2.92	0.62	18.3	7.10	97.84	36.65	156.0	43.5	459	52.6	9568	1.74	78.1	116.7
DG1 S 123	161	8.8	1923	32.94	0.02	33.07	0.76	10.49	18.37	0.79	75.8	22.72	248.07	76.40	285.7	66.7	636	65.0	7180	9.83	163.7	245.9
DG1 S 126	155	10.8	791	11.20		17.40	0.17	3.81	5.93	0.46	22.3	8.59	90.95	30.98	114.6	26.2	289	29.8	7966	4.77	78.2	122.0
DG1 S 128	183	24.7	428	1.67		4.97	0.05	1.06	1.31	0.40	9.0	3.25	39.72	14.84	63.8	16.1	188	22.2	9335	0.74	20.3	46.2
DG1 S 134																						
DG1 S 135	187	6.3	944	0.64	0.30	9.35	0.14	2.48	4.25	1.60	23.2	7.66	87.75	30.92	142.4	40.7	497	60.3	8808	0.39	66.6	111.8

DG1 S 137	289	7.3	1240	20.44		20.60	0.06	1.24	2.55	0.12	21.6	8.91	118.48	45.61	213.4	56.6	685	73.7	10789	9.07	210.0	314.1
DG1 S 139	147	12.2	700	9.58		12.57	0.04	3.35	5.50	0.49	27.9	7.96	86.83	27.53	106.6	25.8	277	28.9	6809	4.61	65.6	89.3
DG1 S 142	220	8.4	894	3.85		11.63	0.12	1.25	3.53	0.50	17.2	7.16	86.09	32.53	142.5	37.3	437	48.6	9434	2.04	177.7	383.1
DG1 S 144	410	6.0	1588	3.35		22.30	0.10	1.87	5.77	0.78	34.9	13.02	160.68	61.79	256.9	65.4	758	82.9	8393	1.19	108.1	123.3
DG1 S 145	197	3.4	597	3.87		13.39	0.01	0.38	1.13	0.11	6.8	3.25	46.22	20.00	104.9	29.3	375	42.8	10089	2.55	98.8	178.8
>10% discordant																						
DG1 L 5	158	10.3	1537	5.72	1.82	15.54	1.03	14.21	18.53	1.12	66.4	19.37	199.47	62.90	231.1	49.9	448	57.3	8976	2.93	68.4	77.3
DG1 L 15	158	16.5	735	4.08	0.10	8.24	0.22	4.32	10.16	1.34	29.5	9.90	99.37	29.87	107.1	25.6	261	27.5	6110	2.04	32.8	46.5
DG1 L 17																						
DG1 L 21	115	9.8	670	11.54		15.01	0.21	3.21	5.77	0.40	21.2	7.67	83.37	27.37	101.4	23.4	254	26.5	6684	4.82	55.2	92.5
DG1 L 28	265	9.8	591	3.19		14.85	0.08	0.91	3.23	1.45	14.9	6.05	66.05	21.78	93.2	24.2	265	32.1	9336	0.93	42.8	55.4
DG1 L 38																						
DG1 S 47																						
DG1 S 48	161	18.4	512	5.03		8.93	0.10	2.13	3.49	0.42	15.2	5.67	62.65	19.89	79.2	18.3	192	22.2	7276	2.85	29.1	52.1
DG1 S 49	1041	18.1	2551	1.72		1.85	0.18	3.39	13.17	3.98	76.4	25.29	296.23	94.26	372.0	90.2	932	108.1	10858	0.60	65.1	262.6
DG1 S 51																						
DG1 S 54																						
DG1 S 58	134	17.4	1017	4.17	0.05	9.69	0.29	5.84	14.55	1.01	46.1	14.12	135.19	41.03	150.5	33.7	330	33.8	6635	2.02	48.2	60.6
DG1 S 64	412	4.8	1755	2.87	0.49	19.06	0.19	4.70	10.19	2.00	48.8	16.66	193.92	66.90	270.7	68.1	699	78.2	8832	0.99	127.5	161.8

DG1 S 66	179	8.2	632	3.77		44.84	0.04	1.17	2.42	0.53	13.2	4.24	57.26	21.47	98.9	29.6	337	39.9	10391	2.09	137.2	352.4
DG1 S 69	139	13.9	522	5.24		8.50	0.13	2.18	5.43	0.40	18.9	4.99	63.30	19.83	77.5	18.0	194	21.1	6871	2.62	32.6	56.6
DG1 S 71																						
DG1 S 74																						
DG1 S 90																						
DG1 S 92																						
DG1 S 104																						
DG1 S 105	117	13.9	1241	5.00	0.05	11.51	0.56	9.62	16.55	1.68	50.1	16.27	163.97	48.87	181.2	39.5	379	42.0	6963	2.18	51.5	65.2
DG1 S 107	186	11.5	694	9.07	2.50	17.29	0.90	5.51	6.00	0.44	24.6	7.46	84.06	27.26	99.0	24.1	242	26.6	7942	4.29	54.7	92.1
DG1 S 108																						
DG1 S 112	205	16.4	1164	29.90	3.15	47.10	0.93	7.54	9.38	2.01	39.7	12.85	143.36	44.47	172.6	37.9	379	40.2	7325	9.39	201.8	207.0
DG1 S 116	122	6.2	1370	13.86		25.30	0.23	6.87	12.28	2.90	47.6	16.33	170.35	52.60	206.9	46.0	457	44.2	5893	5.85	52.3	118.1
DG1 S 118																						
DG1 S 119																						
DG1 S 121	201	8.7	630	3.03		6.35		0.26	2.24	0.15	12.3	4.28	62.29	22.11	96.3	24.6	275	28.3	9342	1.00	37.2	129.8
DG1 S 122																						
DG1 S 124	183	19.6	969	5.23	0.10	10.94	0.34	5.80	9.95	1.29	37.8	9.82	114.92	35.97	136.0	34.7	360	37.8	6894	1.93	37.6	51.0
DG1 S 125	151	12.4	805	8.39		12.83	0.22	4.57	8.58	0.38	30.4	9.89	106.69	33.20	120.4	29.7	293	31.3	7167	4.15	54.7	88.4
DG1 S 127																						
DG1 S 129	156	15.7	552	6.12	0.29	10.19	0.29	2.17	5.38	0.33	18.2	5.62	64.73	22.19	84.3	20.1	203	22.7	7461	2.80	36.2	58.7
DG1 S 130	138	7.8	1619	25.61	0.07	26.31	0.56	9.59	17.39	0.77	56.9	18.06	186.28	61.64	240.3	57.1	575	61.3	7570	9.20	108.8	185.1

DG1 S 131																					
DG1 S 132																					
DG1 S 133																					
DG1 S 136																					
DG1 S 138	190	9.0	1959	42.00	2.01	47.64	0.93	14.50	20.83	0.82	79.6	26.97	284.66	86.51	308.3	69.0	681	66.5	6411	13.90	269.7	309.4
DG1 S 140																					
DG1 S 141																					
DG1 S 148																					

Analysis	**P**	**Ti**	**Y**	**Nb**	**La**	**Ce**	**Pr**	**Nd**	**Sm**	**Eu**	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**	**Hf**	**Ta**	**Th**	**U**
Scout 2																						
<10% discordant																						
Scout2 S 336	104	3.4	1228	17.21		21.20	0.28	4.66	8.59	1.12	44.4	13.19	143.78	49.49	187.1	39.1	352	44.1	5675	5.98	126.4	204.5
Scout2 S 337																						
Scout2 S 338	182	13.3	2469	9.24	0.41	18.82	0.96	12.95	15.24	3.33	73.1	21.60	249.27	94.31	382.5	79.4	718	85.8	6705	6.21	423.0	440.6
Scout2 S 342	123	4.1	827	14.77		18.72	0.18	3.68	6.27	0.66	30.1	9.85	100.86	33.26	126.6	29.0	265	31.3	5248	4.95	79.4	149.9
Scout2 S 351	135	2.2	2898	27.07	0.14	29.38	0.50	8.23	21.65	4.99	98.9	30.35	348.81	116.01	457.5	96.0	870	95.7	7956	14.39	354.0	582.1
Scout2 S 352	66	0.5	300	14.96		11.01		0.19	1.37	0.34	6.9	2.57	33.72	12.00	46.8	11.9	127	13.4	7385	8.68	45.7	163.6
Scout2 S 357	107	5.5	853	16.09	0.48	18.66	0.16	3.04	5.43	0.63	29.5	9.71	103.24	32.48	126.6	27.3	275	30.1	5216	5.50	76.9	163.9
Scout2 S 359																						
Scout2 S 363	182	11.7	956	3.47		18.11	0.27	3.13	7.56	1.73	31.6	9.54	112.08	37.93	138.0	30.7	310	36.0	7073	2.09	87.6	138.1

Scout2 S 365	200	7.3	697	12.88	5.33	31.59	2.59	14.78	6.18	0.52	21.0	7.05	78.20	25.92	104.1	21.6	225	26.4	6098	4.53	76.5	152.8
Scout2 S 375	143		1393	23.92	11.13	56.75	2.68	14.67	12.88	0.92	47.9	16.17	174.36	58.26	210.6	45.9	456	45.5	4849	7.64	101.6	232.0
Scout 2 L 1	220	11.0	629	7.50		17.27	0.09	2.19	4.35	0.99	20.7	6.75	77.17	24.17	104.3	25.5	285	27.7	8236	5.13	76.7	133.7
Scout 2 L 2	182	7.7	647	10.21	0.04	16.74	0.10	1.45	4.09	0.64	21.8	6.69	82.07	26.59	103.7	28.1	307	29.7	9041	7.46	82.6	161.1
>10% discordant																						
Scout2 S 334																						
Scout2 S 335	130	1.7	2811	18.39	1.00	22.00	0.74	9.91	19.15	2.19	102.8	31.35	352.07	116.67	433.8	86.0	792	93.1	6160	6.24	249.9	366.6
Scout2 S 344	114	3.5	963	24.38		27.48	0.16	3.11	6.58	0.84	33.4	11.02	127.81	43.43	161.6	35.8	353	39.4	5543	7.22	143.2	236.4
Scout2 S 346	112	21.5	1174	23.37	3.11	21.54	1.25	12.64	12.88	1.57	48.8	13.61	154.66	46.17	174.9	40.4	421	49.4	7097	10.18	423.1	556.1
Scout2 S 347	157	188.9	4035	137.77	1.74	42.98	0.98	9.13	24.31	2.44	115.7	42.83	497.15	162.18	596.4	127.8	1214	128.7	6172	27.12	738.9	1473.8
Scout2 S 349	155	3.7	1789	61.89		40.22	0.12	3.14	7.65	0.87	52.9	18.15	199.18	67.39	285.3	62.5	566	59.6	6880	21.36	517.2	1078.4
Scout2 S 350	141	9.4	3149	51.52	0.89	30.52	0.45	5.77	16.25	1.78	92.8	30.90	351.53	126.73	478.5	100.4	957	103.1	7349	13.73	502.7	1002.8
Scout2 S 354	288	15.2	1148	5.46	0.40	20.87	0.46	8.50	12.65	2.22	37.1	12.16	136.56	44.68	177.4	39.9	415	52.6	6064	5.96	390.2	437.6
Scout2 S 356	158	5.9	1604	22.43	0.97	32.59	0.75	8.60	15.20	0.91	61.1	18.38	198.68	65.91	253.5	54.3	502	63.5	5758	6.46	214.6	278.3
Scout2 S 358	105	4.8	950	12.23		12.90	0.21	4.96	7.49	0.74	32.8	10.48	121.20	37.76	141.4	30.1	308	32.6	5065	4.26	64.2	138.2
Scout2 S 361																						
Scout2 S 364																						

Scout2 S 367	196	2.7	724	13.81		17.20	0.07	3.37	5.65	0.68	27.5	7.30	88.95	27.87	106.3	23.0	234	26.0	5745	4.78	78.5	149.7
Scout2 S 368																						
Scout2 S 370	184	5.0	1471	7.49	0.16	20.48	1.30	18.09	21.46	1.14	70.6	19.91	195.44	58.95	213.5	45.8	445	54.4	6096	3.45	115.7	146.8
Scout2 S 372	313	7.2	2446	39.04	0.17	23.75	0.04	4.19	9.70	0.86	60.1	21.60	275.80	94.84	380.1	81.6	815	88.6	7597	14.53	604.8	1336.7
Scout2 S 373	190	1.7	3158	135.45	0.23	57.09	0.36	4.46	13.85	1.10	77.9	29.70	354.45	121.55	469.3	102.7	976	106.0	7362	37.06	936.4	2229.3
Scout2 S 376	161	2.6	939	13.92	0.06	16.35	0.21	3.28	6.86	0.62	36.1	10.72	114.45	38.55	144.2	31.0	284	31.6	5376	4.61	68.0	151.0
Scout2 S 378	123	7.2	759	11.38		16.65	0.07	2.63	4.90	0.59	24.6	7.82	86.64	28.24	113.5	24.2	235	24.8	5441	4.68	64.2	140.7
Scout 2 L 3	159	5.7	1758	7.83	0.03	18.12	0.71	13.74	24.20	2.59	87.3	24.02	252.03	76.24	268.6	62.3	595	55.5	6328	3.56	108.1	161.0
Scout 2 L 4	140	5.3	794	15.40	0.63	16.25	0.24	3.15	6.75	0.56	26.7	8.61	100.05	32.03	121.2	28.6	293	28.1	6231	6.35	67.7	140.4
Scout 2 L 5																						

Analysis	**P**	**Ti**	**Y**	**Nb**	**La**	**Ce**	**Pr**	**Nd**	**Sm**	**Eu**	**Gd**	**Tb**	**Dy**	**Ho**	**Er**	**Tm**	**Yb**	**Lu**	**Hf**	**Ta**	**Th**	**U**
Scout 3																						
<10% discordant																						
Scout3 S 380	117	5.3	683	10.59	0.20	15.46	0.11	2.29	5.56	0.41	21.6	7.18	79.01	28.05	103.7	23.7	219	27.4	6379	4.01	60.8	114.8
Scout3 S 383	105	3.8	1587	9.57	0.36	17.41	0.37	10.80	15.92	1.36	75.7	20.28	218.48	66.51	249.3	53.4	461	51.3	5619	3.09	95.5	163.9
Scout3 S 384	114	6.1	822	12.60	0.09	19.55	0.04	3.06	6.04	0.56	30.2	9.20	107.87	32.46	123.3	27.2	265	32.4	6192	4.71	93.7	154.2

Scout3 S 3872860	12.0	849	9.49	602.05	1209.51	162.15	745.64	153.43	5.40	123.3	20.01	126.90	33.05	112.9	24.6	225	27.5	6701	3.59	76.6	107.5
Scout3 S 38893	19.7	429	7.29		8.62	0.29	3.49	4.74	1.26	16.4	5.03	51.09	19.10	70.8	15.9	168	20.7	5946	3.65	70.0	122.3
Scout3 S 389143	7.1	791	14.20	1.40	21.87	0.32	4.65	8.37	0.70	30.8	9.09	95.36	30.80	115.7	24.8	255	28.6	5474	4.66	79.7	142.0
Scout3 S 390128	6.2	1199	25.11	3.02	25.69	0.98	7.21	9.17	0.91	38.1	12.78	144.68	50.31	186.8	38.8	374	44.5	5798	7.40	92.6	198.6
Scout3 S 391113	6.3	639	11.31	0.02	15.57	0.02	1.40	5.57	0.32	21.7	6.80	76.31	24.33	95.6	22.1	212	26.6	6311	3.84	58.3	119.7
Scout3 S 392138	4.6	858	13.71		18.98	0.06	2.24	6.11	0.72	27.2	8.88	93.34	33.41	124.5	28.2	251	29.2	6109	5.51	93.4	171.9
Scout3 S 394128	7.1	826	16.06		19.32	0.07	3.39	5.32	0.78	29.2	9.44	95.68	32.47	132.8	31.1	290	31.8	6531	6.24	96.1	180.9
Scout3 S 396203	8.5	674	8.23	1.85	24.00	0.52	6.18	7.04	0.69	25.0	7.04	76.74	24.89	105.5	25.0	243	27.8	6549	4.70	112.6	183.0
Scout3 S 397150	10.6	650	9.93	0.12	17.19	0.19	3.39	4.91	0.23	22.9	6.72	80.33	26.88	106.6	23.3	244	32.0	7007	4.14	79.5	148.6
Scout3 S 398130	7.6	946	8.95	0.03	15.71	0.43	7.39	11.15	0.56	37.2	11.82	125.70	38.80	138.7	31.6	324	36.9	5821	4.27	74.5	123.3
Scout3 S 400159	4.7	663	11.79	1.99	22.64	1.01	5.96	7.11	0.25	24.4	7.12	80.28	26.23	103.3	24.2	226	26.1	7463	4.57	61.8	127.2
Scout3 S 402																					
Scout3 S 40598	1.7	831	11.40		17.80	0.09	4.33	6.32	0.90	31.2	9.51	99.50	32.02	133.3	28.1	263	29.5	5921	4.90	66.0	134.7
Scout3 S 406166	4.9	998	20.10		21.41	0.09	3.08	8.26	0.71	37.4	11.35	119.21	39.07	153.2	36.0	331	38.1	5502	6.59	114.9	206.3
Scout3 S 414																					
Scout3 S 415154	8.6	850	14.71	0.03	13.80	0.18	3.65	7.70	0.86	32.2	9.42	101.96	35.31	128.1	30.1	291	34.2	6520	7.15	56.5	137.0
Scout3 S 422187	4.5	1387	10.96	2.14	22.54	1.20	9.33	13.08	1.01	48.9	17.06	177.45	57.68	204.5	43.1	391	45.0	5543	4.29	95.4	175.1

Scout3 S 442215	11.3	1169	14.14		29.29	0.61	7.30	10.59	0.79	44.6	15.04	140.14	45.48	176.8	38.8	373	45.7	6321	5.52	238.6	327.0
Scout3 S 445134	8.6	948	10.13	0.53	17.57	0.08	5.34	9.87	0.57	33.1	11.06	122.22	36.27	144.2	30.9	281	34.6	5705	3.40	68.6	116.8
Scout 3 L 16187	8.6	1317	9.80	0.90	21.16	1.15	16.93	21.33	1.55	70.0	18.81	188.66	55.93	199.9	48.5	506	48.3	7109	4.41	120.9	159.5
Scout 3 L 20																					
Scout 3 L 21170	16.7	486	6.25		12.82	0.10	1.69	4.68	0.34	19.7	5.06	57.46	19.70	76.0	18.1	217	23.1	8328	3.28	52.6	92.8
Scout 3 L 22																					
Scout 3 L 23171	7.1	830	16.51		18.82	0.14	3.73	6.67	0.73	32.5	9.44	109.66	35.44	137.0	30.9	336	32.0	7426	6.76	93.2	165.6
Scout 3 L 26																					
Scout 3 L 31153	4.4	963	37.95	0.07	17.69	0.08	2.20	4.35	0.32	32.0	10.13	115.19	40.57	161.2	38.7	415	37.0	9798	15.70	151.8	392.7
Scout 3 L 37																					
Scout 3 L 38119	5.9	710	15.93		17.13	0.10	2.08	6.74	0.48	25.3	8.77	93.18	30.02	112.5	28.2	302	26.5	6587	6.58	72.2	154.6
Scout 3 L 39																					
>10% discordant																					
Scout3 S 381																					
Scout3 S 386																					
Scout3 S 393102	5.7	839	10.04	0.09	14.76	0.27	3.83	6.78	0.63	31.5	9.87	102.86	32.83	129.0	28.1	281	31.7	6040	3.88	63.2	125.6
Scout3 S 395136	6.1	637	12.54		14.10	0.17	2.27	5.45	0.37	24.6	7.58	84.58	26.39	106.3	24.7	256	27.0	6260	4.23	57.1	119.8
Scout3 S 403142	6.4	616	11.73		15.89	0.10	1.65	4.82	0.55	22.3	6.89	76.25	24.21	100.6	20.9	229	25.3	6449	4.30	62.4	134.4
Scout3 S 404																					
Scout3 S 408143	7.6	679	13.05		18.02	0.19	4.33	6.02	0.65	22.6	7.54	84.08	26.75	101.8	23.5	239	28.5	6701	4.61	83.4	147.1

Scout3 S 409119	2.4	1177	17.99		17.90	0.18	4.07	8.05	1.12	39.4	12.04	143.75	45.82	172.8	38.1	348	40.0	5234	5.35	84.6	187.9
Scout3 S 410163	6.6	763	12.09	0.08	13.98	0.26	2.51	5.58	0.53	28.6	8.28	95.07	30.53	116.1	25.2	260	29.6	6503	5.04	55.6	114.4
Scout3 S 411																					
Scout3 S 412203	2.7	4518	117.73		65.59	0.62	11.46	32.55	1.91	174.5	57.96	609.02	192.00	707.1	144.8	1193	128.2	5697	21.74	597.5	1179.0
Scout3 S 413																					
Scout3 S 416167	6.7	1831	18.17	0.45	20.83	0.60	12.41	17.88	1.48	74.7	22.53	235.10	75.22	271.0	59.7	538	62.2	6921	7.37	141.1	225.4
Scout3 S 418115	13.9	1162	12.33	0.17	12.78	0.88	12.11	16.27	3.17	52.1	14.53	167.58	49.82	187.3	42.3	409	47.8	5918	3.95	124.9	206.6
Scout3 S 419																					
Scout3 S 420168	7.5	1052	10.24	0.06	15.60	0.27	5.48	9.54	0.73	38.0	11.64	121.45	40.55	152.7	33.1	312	36.2	6418	3.38	78.4	137.4
Scout3 S 421198	6.8	1201	15.72		20.86	0.57	6.83	12.06	0.92	47.8	14.53	141.08	47.73	182.2	39.8	386	46.6	6534	4.89	126.2	200.4
Scout3 S 423184	6.6	1720	11.61	0.46	19.96	0.86	14.52	18.89	1.38	68.4	21.55	211.23	66.21	252.4	52.4	519	58.5	6225	3.52	136.4	198.4
Scout3 S 424																					
Scout3 S 425																					
Scout3 S 426																					
Scout3 S 427194	5.5	1262	13.62	0.01	18.02	0.33	8.49	12.26	0.82	50.3	13.81	155.87	49.43	183.4	39.7	370	43.8	5923	4.48	92.9	168.7
Scout3 S 428147	6.3	835	15.85	0.06	18.71	0.09	3.43	4.81	0.67	24.0	7.42	95.00	31.11	124.8	26.2	265	32.2	5819	5.12	87.9	174.1
Scout3 S 432																					
Scout3 S 433165	7.0	1910	29.86	0.05	31.76	0.67	8.00	15.00	1.23	75.7	21.63	241.63	76.57	286.9	58.6	531	58.9	5091	7.91	228.3	339.1
Scout3 S 435160	6.1	598	11.42		14.29	0.02	1.65	3.67	0.31	18.8	6.58	66.35	22.43	87.8	21.0	191	23.5	6740	4.73	43.0	95.9

Scout3 S 436	168	8.4	710	12.80		16.24	0.08	3.26	7.04	0.48	24.1	7.66	79.36	26.83	110.6	22.4	227	28.5	6077	4.62	69.4	138.3
Scout3 S 437																						
Scout3 S 438	138	8.8	976	6.21	0.63	13.53	0.33	6.45	10.55	0.83	42.1	11.49	127.45	37.36	144.2	30.0	287	34.5	5561	2.47	56.4	110.5
Scout3 S 439																						
Scout3 S 443	208	3.9	885	20.38	21.93	64.50	6.60	30.23	12.20	0.77	36.4	10.60	106.82	35.15	133.0	28.9	292	33.5	6203	6.59	105.5	182.8
Scout 3 L 14	145	5.8	1728	10.81	0.16	16.63	0.49	8.93	17.86	1.84	75.2	23.27	243.73	75.19	263.9	58.2	589	50.8	5749	4.71	99.8	168.0
Scout 3 L 15	127	4.4	862	17.39	0.06	18.86	0.10	2.96	5.92	0.81	32.6	10.66	118.81	36.82	138.9	33.9	331	29.6	5893	6.58	93.4	181.8
Scout 3 L 17	173	8.2	728	15.46		17.89	0.16	2.15	6.53	0.41	29.8	8.61	92.00	30.64	112.6	27.5	288	27.6	7176	5.89	79.9	143.5
Scout 3 L 18	179	4.5	3782	64.62	0.07	68.97	0.54	17.84	38.43	3.79	168.2	55.24	578.79	175.76	605.9	130.3	1215	106.5	5384	16.21	463.7	564.9
Scout 3 L 19	176	13.4	365	6.32		3.66	0.02	1.24	2.84	1.73	14.5	4.44	47.60	15.71	60.3	14.5	159	16.5	7835	2.58	13.2	35.4
Scout 3 L 24	183	3.6	5314	118.44	0.02	51.63	0.36	9.24	32.30	1.46	163.6	65.55	720.73	236.41	867.5	196.9	1879	162.7	8839	25.13	559.1	1200.4
Scout 3 L 25	234	7.5	1452	34.20	3.62	46.14	1.15	10.24	12.42	1.17	51.0	16.91	190.26	59.81	228.6	52.4	533	51.8	8565	14.62	375.3	459.4
Scout 3 L 27	152	10.1	473	10.11	0.32	13.27	0.12	1.85	2.85	0.34	18.5	4.89	55.74	18.06	76.6	20.5	198	20.9	8336	4.31	40.6	78.6
Scout 3 L 29	136	6.9	1033	39.91	0.10	14.40	0.27	3.48	9.48	0.36	37.1	13.09	143.26	44.86	169.9	42.4	420	40.4	6435	12.45	127.5	257.5
Scout 3 L 30	262	8.6	3517	137.24	0.06	91.93	0.78	13.37	31.94	1.20	143.5	46.63	493.35	153.19	556.9	121.3	1246	112.1	7551	36.35	674.1	911.6
Scout 3 L 32																						
Scout 3 L 33	206	9.4	2077	17.58	0.11	24.94	0.78	13.40	23.37	2.07	96.1	28.08	291.21	88.58	315.6	71.4	720	70.5	6550	7.06	208.8	251.7

Scout 3 L 34154	6.3	713	14.50		15.86	0.08	2.60	5.15	0.51	26.3	8.16	90.61	27.70	105.1	26.1	274	26.8	6888	5.83	64.0	131.5
Scout 3 L 35151	5.8	1536	13.39	0.21	15.86	0.47	8.01	15.26	1.65	66.0	19.94	205.63	63.87	231.3	52.2	544	50.6	5858	5.59	93.8	174.4

APPENDIX 4D:

BSU zircon CA-IDTIMS U-Pb geochronology

	Compositional Parameters					Radiogenic Isotope Ratios									Isotopic Ages					
Sample	Th/U	$^{206}Pb^*$ x10^{-13} mol	mol % $^{206}Pb^*$	Pb^*/Pbc	Pbc (pg)	$^{206}Pb/^{204}Pb$	$^{208}Pb/^{206}Pb$	$^{207}Pb/^{206}Pb$	% err	$^{207}Pb/^{235}U$	% err	$^{206}Pb/^{238}U$	% err	corr. coef.	$^{207}Pb/^{206}Pb$	±	$^{207}Pb/^{235}U$	±	$^{206}Pb/^{238}U$	±
(a)	(b)	(c)	(c)	(c)	(c)	(d)	(e)	(e)	(f)	(e)	(f)	(e)	(f)		(g)	(f)	(g)	(f)	(g)	(f)
01DS-05																				
z1	0.312	9.2947	99.86	210	1.06	13378	0.097	0.061379	0.063	0.830055	0.126	0.098081	0.065	0.981	652.55	1.36	613.64	0.58	603.15	0.37
z2	0.422	18.0446	99.92	357	1.24	22093	0.131	0.061393	0.062	0.893797	0.125	0.105588	0.066	0.976	653.04	1.34	648.41	0.60	647.08	0.41
z4	0.374	15.3415	99.91	310	1.20	19386	0.116	0.061416	0.062	0.891001	0.124	0.105219	0.065	0.985	653.83	1.32	646.91	0.60	644.92	0.40
z5	0.345	7.5737	99.94	480	0.38	30086	0.107	0.061360	0.064	0.883493	0.125	0.104428	0.064	0.972	651.87	1.38	642.87	0.60	640.31	0.39
z6	0.397	38.8188	99.97	871	1.09	54149	0.123	0.061319	0.063	0.878659	0.124	0.103926	0.066	0.971	650.44	1.35	640.26	0.59	637.37	0.40
z7	0.301	7.5179	99.93	395	0.45	25065	0.093	0.061371	0.059	0.889629	0.123	0.105135	0.065	0.999	652.25	1.26	646.17	0.59	644.43	0.40
z8	0.312	20.8323	99.95	535	0.93	34025	0.097	0.061378	0.060	0.894614	0.123	0.105712	0.065	0.988	652.50	1.29	648.85	0.59	647.79	0.40
z9	0.476	16.1411	99.97	1042	0.39	63083	0.148	0.061307	0.061	0.873391	0.124	0.103323	0.065	0.978	650.04	1.31	637.41	0.58	633.85	0.39
z10	0.401	27.4584	99.98	1857	0.36	114585	0.124	0.061435	0.040	0.898469	0.088	0.106068	0.053	0.952	654.51	0.87	650.91	0.42	649.87	0.33

z11a	0.339	13.9199	99.95	537	0.62	33823	0.105	0.061447	0.062	0.898662	0.125	0.106070	0.066	0.974	654.93	1.34	651.01	0.60	649.88 0.41
z11b	0.288	5.4134	99.94	466	0.28	29573	0.089	0.061437	0.059	0.899464	0.123	0.106182	0.064	0.996	654.57	1.28	651.44	0.59	650.54 0.39
z12	0.405	24.5840	99.97	928	0.65	57408	0.126	0.061414	0.061	0.899035	0.124	0.106171	0.067	0.974	653.77	1.31	651.21	0.60	650.47 0.42
z13	0.268	18.7023	99.97	822	0.54	52758	0.083	0.061425	0.061	0.898231	0.123	0.106058	0.065	0.981	654.14	1.30	650.78	0.59	649.81 0.40
z14	0.295	3.7967	99.78	130	0.69	8335	0.092	0.061422	0.070	0.894790	0.130	0.105656	0.064	0.967	654.05	1.49	648.94	0.62	647.47 0.40
z15	0.215	3.6053	99.89	256	0.33	16599	0.067	0.061392	0.068	0.887135	0.127	0.104803	0.064	0.966	653.01	1.45	644.83	0.61	642.50 0.39

2KE085A

z1	0.847	10.0084	99.97	1152	0.24	63277	0.263	0.061284	0.061	0.895482	0.122	0.105976	0.063	0.987	649.23	1.31	649.31	0.59	649.33 0.39
z2	0.975	13.6096	99.98	1803	0.21	95997	0.303	0.061344	0.063	0.896148	0.123	0.105951	0.063	0.977	651.33	1.34	649.67	0.59	649.19 0.39
z3	1.010	13.0305	99.98	1513	0.24	80056	0.313	0.061356	0.060	0.896337	0.122	0.105952	0.063	0.988	651.75	1.30	649.77	0.59	649.20 0.39
z4a	1.035	3.7652	99.94	529	0.20	27772	0.321	0.061337	0.063	0.896080	0.125	0.105956	0.064	0.981	651.07	1.36	649.63	0.60	649.22 0.40
z4b	0.921	5.2474	99.96	948	0.15	51051	0.286	0.061314	0.062	0.896373	0.123	0.106030	0.063	0.986	650.26	1.32	649.79	0.59	649.65 0.39
z5	0.807	7.8312	99.97	1191	0.18	65904	0.251	0.061306	0.061	0.895278	0.123	0.105915	0.063	0.985	649.97	1.32	649.20	0.59	648.98 0.39

3KE043

z1a	0.519	0.6189	99.62	81	0.19	4802	0.161	0.061437	0.103	0.902428	0.159	0.106532	0.072	0.877	654.58	2.20	653.02	0.77	652.57 0.44

z1b	0.527	0.2847	98.83	26	0.28	1548	0.163	0.061288	0.225	0.899993	0.277	0.106502	0.095	0.673	649.37	4.83	651.72	1.33	652.40	0.59
z2a	0.493	0.3780	99.23	39	0.24	2356	0.153	0.061337	0.179	0.899620	0.229	0.106374	0.084	0.714	651.06	3.83	651.52	1.10	651.66	0.52
z2b	0.721	1.4780	99.62	85	0.46	4865	0.224	0.061361	0.088	0.901034	0.143	0.106500	0.066	0.911	651.90	1.88	652.28	0.69	652.39	0.41
z2c	0.560	0.4840	99.27	42	0.29	2492	0.174	0.061312	0.140	0.899273	0.193	0.106376	0.076	0.795	650.20	3.02	651.34	0.93	651.67	0.47
z3a	0.526	0.4834	98.84	26	0.47	1584	0.163	0.061440	0.173	0.902130	0.225	0.106493	0.079	0.755	654.66	3.72	652.87	1.08	652.35	0.49
z3b	0.444	0.2890	98.78	24	0.30	1488	0.138	0.061490	0.213	0.903159	0.270	0.106527	0.098	0.697	656.41	4.58	653.41	1.30	652.55	0.61
z4a	0.467	0.1733	98.43	19	0.23	1152	0.145	0.060935	0.332	0.893884	0.396	0.106393	0.127	0.622	636.94	7.14	648.45	1.90	651.77	0.79
z4b	0.689	1.3108	99.60	79	0.44	4535	0.214	0.061407	0.081	0.901463	0.141	0.106471	0.066	0.948	653.52	1.75	652.51	0.68	652.22	0.41
z5a	0.416	0.1049	96.75	9	0.29	559	0.129	0.061205	0.530	0.898618	0.606	0.106484	0.186	0.534	646.45	11.39	650.99	2.91	652.30	1.16
z5b	0.485	0.9538	99.68	93	0.26	5627	0.150	0.061334	0.090	0.900900	0.147	0.106531	0.067	0.910	650.96	1.94	652.21	0.71	652.57	0.41

3KE044

z1	1.102	10.8626	99.75	142	2.21	7489	0.342	0.061335	0.067	0.898684	0.128	0.106266	0.064	0.980	651.02	1.44	651.02	0.62	651.03	0.39
z2a	0.859	1.2927	99.73	122	0.29	6723	0.267	0.061350	0.078	0.898435	0.137	0.106211	0.065	0.947	651.54	1.68	650.89	0.66	650.70	0.41
z2b	0.880	1.8961	99.80	168	0.31	9223	0.273	0.061390	0.070	0.899165	0.131	0.106228	0.064	0.969	652.94	1.51	651.28	0.63	650.80	0.40
z3	2.065	2.4012	99.86	293	0.29	12553	0.641	0.061398	0.074	0.898807	0.132	0.106171	0.065	0.944	653.22	1.58	651.09	0.63	650.47	0.40

z4	0.960	9.3578	99.97	1224	0.21	65414	0.298	0.061422	0.061	0.899646	0.122	0.106229	0.064	0.985	654.06	1.31	651.54	0.59	650.81
0.39																			
z5a	4.336	1.7579	99.78	275	0.32	8335	1.345	0.061465	0.074	0.900619	0.133	0.106270	0.065	0.955	655.54	1.59	652.06	0.64	651.05
0.40																			
z5b	3.806	1.6526	99.85	385	0.20	12441	1.181	0.061376	0.071	0.899075	0.131	0.106242	0.065	0.961	652.43	1.53	651.23	0.63	650.89
0.40																			

09RL762

z1	0.461	19.4413	99.97	1085	0.45	65975	0.144	0.061399	0.069	0.806819	0.126	0.095305	0.065	0.947	653.23	1.47	600.67	0.57	586.83
0.36																			
z2	0.311	11.5177	99.97	922	0.30	58127	0.097	0.061509	0.061	0.841720	0.122	0.099250	0.064	0.987	657.08	1.30	620.09	0.57	610.01
0.37																			
z3	0.526	8.1180	99.96	849	0.24	50430	0.164	0.061316	0.063	0.784513	0.124	0.092795	0.065	0.975	650.34	1.35	588.05	0.55	572.05
0.35																			
z4	0.183	13.7098	99.97	987	0.32	64280	0.057	0.065465	0.063	0.880161	0.124	0.097511	0.064	0.972	789.31	1.33	641.07	0.59	599.81
0.37																			
z5	0.245	29.8964	99.98	1877	0.37	120817	0.076	0.061292	0.064	0.758962	0.125	0.089808	0.066	0.963	649.49	1.37	573.41	0.55	554.40
0.35																			
z6	0.580	24.1599	99.98	1913	0.32	112529	0.180	0.061452	0.062	0.847871	0.124	0.100067	0.067	0.970	655.10	1.32	623.48	0.58	614.80
0.39																			
z7	0.440	10.2473	99.93	403	0.63	24695	0.137	0.061496	0.061	0.816222	0.123	0.096263	0.064	0.989	656.63	1.31	605.94	0.56	592.47
0.36																			
z8	0.508	3.7402	99.85	208	0.45	12523	0.159	0.061124	0.065	0.705277	0.127	0.083684	0.065	0.982	643.61	1.39	541.94	0.53	518.08
0.32																			
z9	0.291	5.0346	99.90	292	0.41	18563	0.091	0.061419	0.062	0.800820	0.125	0.094565	0.064	0.989	653.94	1.34	597.29	0.56	582.48
0.35																			
z10	0.406	1.4482	99.69	97	0.37	5972	0.127	0.061074	0.077	0.674230	0.137	0.080067	0.066	0.957	641.84	1.65	523.28	0.56	496.52
0.31																			
z11	0.405	5.8251	99.89	266	0.54	16420	0.127	0.061479	0.064	0.707844	0.125	0.083504	0.063	0.983	656.04	1.37	543.47	0.53	517.01
0.31																			

15VI003

z1	0.680	2.6870	99.82	174	0.40	10057	0.211	0.062245	0.069	0.844732	0.129	0.098427	0.064	0.968	682.54	1.48	621.75	0.60	605.18	0.37
z2	0.716	0.8240	99.57	74	0.30	4217	0.222	0.062253	0.099	0.888970	0.156	0.103568	0.072	0.882	682.81	2.11	645.82	0.75	635.29	0.44
z4	0.725	3.2635	99.86	237	0.37	13495	0.225	0.062260	0.065	0.877320	0.127	0.102199	0.065	0.980	683.05	1.38	639.53	0.60	627.28	0.39
z3	0.787	9.8444	99.96	923	0.29	51560	0.244	0.062352	0.061	0.905129	0.123	0.105283	0.065	0.982	686.20	1.30	654.46	0.59	645.30	0.40
z5	0.823	2.1081	99.74	124	0.46	6932	0.255	0.062487	0.074	0.934511	0.133	0.108465	0.065	0.957	690.83	1.57	670.01	0.65	663.83	0.41
z6	0.941	1.3066	99.64	94	0.39	5081	0.292	0.062541	0.077	0.968881	0.139	0.112357	0.068	0.953	692.67	1.63	687.89	0.69	686.42	0.44
z7a	0.720	1.2460	99.18	39	0.85	2240	0.223	0.062593	0.106	0.968316	0.163	0.112200	0.072	0.877	694.42	2.26	687.60	0.81	685.51	0.47
z7b	0.937	0.6537	99.16	40	0.46	2179	0.290	0.062777	0.256	0.978791	0.303	0.113081	0.113	0.572	700.68	5.44	692.98	1.52	690.62	0.74
z8a	0.523	0.0343	81.56	1	0.64	100	0.162	0.062842	5.666	0.976674	5.842	0.112719	0.695	0.309	702.90	120.60	691.90	29.31	688.52	4.54
z8b	0.735	0.0360	87.58	2	0.42	148	0.228	0.062287	3.891	0.950472	4.045	0.110672	0.843	0.284	683.99	83.07	678.35	20.02	676.65	5.41
z8c	0.562	0.1091	96.00	7	0.38	457	0.174	0.062536	0.712	0.977177	0.802	0.113330	0.227	0.514	692.48	15.18	692.16	4.02	692.06	1.49
z9	0.604	1.4232	99.70	104	0.35	6101	0.187	0.062561	0.088	0.972642	0.143	0.112758	0.066	0.910	693.36	1.87	689.82	0.72	688.74	0.43
z10a	0.502	0.2341	98.28	17	0.34	1063	0.155	0.062539	0.298	0.976723	0.381	0.113272	0.176	0.651	692.58	6.35	691.92	1.91	691.72	1.15
z10b	0.581	0.1785	97.56	12	0.37	748	0.180	0.062565	0.550	0.975199	0.655	0.113048	0.253	0.576	693.47	11.72	691.14	3.28	690.42	1.66
z11	0.534	0.0637	93.25	4	0.38	271	0.165	0.062450	1.328	0.951342	1.614	0.110485	0.824	0.572	689.56	28.33	678.80	7.99	675.56	5.28

z12a	1.024	0.4518	98.60	24	0.53	1314	0.317	0.062614	0.195	0.976608	0.254	0.113123	0.099	0.725	695.14	4.15	691.86	1.28	690.86	0.65
z12b	0.795	2.4000	99.70	109	0.60	6119	0.246	0.062606	0.102	0.959537	0.154	0.111159	0.070	0.845	694.88	2.18	683.06	0.76	679.47	0.45
z13a	0.725	1.2919	99.60	79	0.43	4530	0.225	0.062551	0.099	0.971742	0.156	0.112672	0.071	0.883	693.00	2.12	689.36	0.78	688.25	0.46
z13b	0.805	0.5399	99.00	32	0.45	1832	0.249	0.062599	0.149	0.973870	0.204	0.112832	0.077	0.806	694.63	3.18	690.46	1.02	689.17	0.50
z14	1.175	4.4783	99.72	125	1.05	6498	0.364	0.062495	0.084	0.971169	0.140	0.112707	0.067	0.911	691.08	1.79	689.07	0.70	688.45	0.44
DG-1																				
z1	0.637	1.3275	99.75	124	0.28	7189	0.198	0.061815	0.093	0.930534	0.146	0.109179	0.068	0.870	667.71	2.00	667.92	0.71	667.98	0.43
z2	0.743	1.5015	99.83	188	0.21	10611	0.230	0.061839	0.070	0.929928	0.132	0.109066	0.066	0.968	668.53	1.50	667.60	0.65	667.32	0.42
z3	0.609	0.6273	99.24	41	0.40	2415	0.189	0.061768	0.122	0.930190	0.179	0.109221	0.075	0.852	666.10	2.62	667.73	0.88	668.22	0.47
z4	0.587	0.5475	98.42	19	0.72	1163	0.182	0.061681	0.166	0.926331	0.220	0.108922	0.077	0.783	663.07	3.56	665.70	1.07	666.48	0.49
z5	0.583	0.3166	97.39	12	0.70	704	0.181	0.061720	0.272	0.928147	0.328	0.109065	0.101	0.662	664.44	5.83	666.66	1.60	667.32	0.64
z6	0.640	0.2333	98.92	29	0.21	1678	0.198	0.061861	0.230	0.931160	0.299	0.109170	0.102	0.770	669.32	4.92	668.24	1.46	667.93	0.65
Scout 2																				
z1	0.569	3.6661	98.92	28	3.37	1630	0.176	0.062685	0.105	0.971679	0.164	0.112424	0.071	0.892	697.55	2.25	689.33	0.82	686.81	0.46
z2	0.641	4.7412	99.56	70	1.75	4041	0.199	0.062572	0.078	0.947231	0.138	0.109792	0.066	0.951	693.73	1.67	676.66	0.68	671.54	0.42
z3	0.574	1.5540	99.25	41	0.98	2379	0.178	0.062801	0.108	0.983431	0.164	0.113573	0.069	0.884	701.49	2.29	695.36	0.82	693.47	0.45

z4	0.489	3.2710	99.67	91	0.90	5435	0.151	0.062660	0.080	0.974504	0.139	0.112796	0.067	0.932	696.71	1.71	690.78	0.70	688.96	0.44
z5	0.553	0.9237	98.64	22	1.07	1307	0.171	0.062970	0.195	0.976892	0.254	0.112516	0.103	0.708	707.21	4.15	692.01	1.27	687.34	0.67
z6	0.549	0.4456	97.65	13	0.90	756	0.170	0.062689	0.316	0.991133	0.369	0.114668	0.093	0.658	697.69	6.73	699.30	1.87	699.80	0.62
z7	0.914	0.6520	99.27	45	0.40	2469	0.283	0.062760	0.192	0.985778	0.239	0.113918	0.076	0.719	700.11	4.08	696.56	1.20	695.46	0.50
z8	0.980	1.6586	99.77	149	0.31	7953	0.303	0.062625	0.080	0.984624	0.140	0.114031	0.068	0.928	695.52	1.71	695.97	0.70	696.12	0.45
z9	0.509	1.6722	99.45	54	0.78	3221	0.158	0.062600	0.105	0.985368	0.160	0.114162	0.067	0.884	694.67	2.25	696.35	0.81	696.87	0.44
z10	0.484	0.5429	98.89	27	0.51	1621	0.150	0.062635	0.220	0.986637	0.267	0.114245	0.084	0.661	695.87	4.70	697.00	1.35	697.35	0.56
z11	0.481	0.3973	98.76	24	0.42	1449	0.149	0.062882	0.283	0.992548	0.331	0.114478	0.090	0.638	704.25	6.01	700.02	1.68	698.70	0.59
z12	0.816	0.4638	98.96	31	0.41	1731	0.252	0.062738	0.240	0.986156	0.295	0.114002	0.099	0.672	699.37	5.11	696.76	1.49	695.95	0.65
z14	0.512	0.1607	97.60	12	0.33	753	0.158	0.063192	0.573	0.995280	0.660	0.114231	0.200	0.558	714.68	12.18	701.41	3.34	697.27	1.32
z15	0.473	0.2056	97.91	14	0.36	862	0.146	0.063045	0.477	0.991716	0.548	0.114086	0.143	0.596	709.76	10.14	699.60	2.77	696.43	0.94
z17	0.515	0.5500	95.43	6	2.21	387	0.159	0.063042	0.332	0.992508	0.385	0.114183	0.098	0.627	709.65	7.06	700.00	1.94	697.00	0.65
z18	0.451	0.3858	99.15	35	0.27	2130	0.140	0.062764	0.206	0.984565	0.275	0.113770	0.130	0.700	700.26	4.39	695.94	1.39	694.61	0.86
z19	0.547	0.1647	98.26	17	0.24	1034	0.169	0.063641	0.581	1.006924	0.678	0.114752	0.234	0.557	729.70	12.32	707.32	3.46	700.29	1.55
z20	0.658	0.1282	97.75	14	0.24	802	0.204	0.062903	0.670	0.991783	0.756	0.114353	0.197	0.542	704.94	14.26	699.63	3.82	697.98	1.30

Scout 3

z1	0.557	2.6721	99.80	151	0.45	8898	0.173	0.062596	0.079	0.961538	0.136	0.111409	0.065	0.934	694.53	1.67	684.09	0.68	680.92	0.42
z2	0.685	1.3765	99.67	96	0.38	5464	0.213	0.061929	0.095	0.868010	0.158	0.101655	0.082	0.876	671.65	2.02	634.49	0.75	624.10	0.49
z3	0.616	2.6178	99.51	63	1.08	3620	0.191	0.062602	0.091	0.941454	0.153	0.109070	0.077	0.888	694.75	1.95	673.64	0.75	667.35	0.49
z4	0.755	5.3774	99.90	320	0.45	17902	0.234	0.062713	0.064	0.978042	0.126	0.113109	0.065	0.979	698.52	1.35	692.60	0.63	690.78	0.43
z5	0.537	0.8951	98.65	22	1.02	1319	0.166	0.062601	0.174	0.950024	0.394	0.110066	0.332	0.900	694.70	3.70	678.12	1.95	673.13	2.12
z6	0.619	2.1778	99.85	210	0.27	12161	0.192	0.062749	0.070	0.992553	0.131	0.114721	0.066	0.961	699.74	1.50	700.02	0.66	700.11	0.44
z7	0.682	1.0773	99.74	121	0.23	6903	0.211	0.062690	0.090	0.987404	0.147	0.114234	0.068	0.907	697.73	1.92	697.39	0.74	697.29	0.45
z8	0.547	0.2882	98.75	24	0.30	1444	0.169	0.062809	0.313	0.990118	0.371	0.114331	0.118	0.609	701.76	6.67	698.78	1.87	697.85	0.78
z9	0.723	3.4692	99.84	204	0.45	11502	0.224	0.062682	0.067	0.988406	0.129	0.114364	0.064	0.977	697.47	1.43	697.91	0.65	698.04	0.42
z10	0.592	0.4574	99.35	47	0.25	2771	0.183	0.062916	0.191	0.997825	0.241	0.115024	0.083	0.709	705.41	4.06	702.71	1.22	701.86	0.55
z11	0.537	0.2779	98.82	26	0.27	1534	0.166	0.062867	0.306	0.960626	0.358	0.110823	0.106	0.604	703.75	6.52	683.62	1.78	677.52	0.68
z12	0.555	1.7751	99.82	175	0.26	10282	0.172	0.062750	0.091	0.989714	0.146	0.114392	0.066	0.907	699.76	1.93	698.57	0.74	698.21	0.44
z13	0.611	0.8271	97.99	15	1.42	884	0.189	0.062795	0.192	0.993939	0.245	0.114797	0.079	0.763	701.31	4.08	700.73	1.24	700.55	0.52
z14	0.654	3.2361	99.78	143	0.59	8208	0.202	0.062721	0.069	0.988893	0.131	0.114350	0.065	0.976	698.78	1.46	698.16	0.66	697.96	0.43
z15	0.544	0.3069	97.99	15	0.52	894	0.169	0.063545	0.411	1.000808	0.477	0.114227	0.125	0.618	726.52	8.72	704.22	2.42	697.25	0.82
z16	0.542	0.2685	98.01	15	0.45	905	0.168	0.063117	0.389	0.993817	0.455	0.114199	0.137	0.595	712.16	8.26	700.67	2.30	697.09	0.91

z17	0.480	0.1008	96.05	7	0.34	457	0.149	0.062814	0.961	0.996385	1.155	0.115045	0.504	0.570	701.95	20.46	701.97	5.85	701.98	3.35
z18	0.674	0.1042	97.14	11	0.25	631	0.209	0.064380	0.979	1.020494	1.097	0.114964	0.241	0.571	754.12	20.67	714.16	5.62	701.51	1.60
z19	0.664	0.3998	98.97	30	0.34	1758	0.206	0.062799	0.275	0.989772	0.334	0.114309	0.114	0.642	701.43	5.85	698.60	1.68	697.73	0.75
z20	0.572	0.3569	99.18	37	0.24	2208	0.177	0.063084	0.239	0.994047	0.290	0.114284	0.091	0.672	711.06	5.07	700.78	1.47	697.58	0.60
SMM08-1SG																				
z1	0.396	6.7617	99.93	400	0.41	24514	0.123	0.063249	0.065	1.027719	0.128	0.117847	0.070	0.958	716.62	1.38	717.79	0.66	718.16	0.47
z2	0.401	7.4176	99.93	410	0.44	25101	0.124	0.063289	0.060	1.028696	0.130	0.117885	0.077	0.962	717.96	1.28	718.28	0.67	718.38	0.52
z3	0.474	1.5464	99.73	109	0.35	6566	0.146	0.063283	0.081	1.028612	0.147	0.117886	0.080	0.909	717.76	1.73	718.23	0.76	718.38	0.54
z4	0.792	4.6716	99.88	268	0.47	14906	0.245	0.063214	0.068	1.024735	0.129	0.117571	0.065	0.963	715.43	1.45	716.29	0.66	716.57	0.44
z5	0.471	1.4994	99.65	85	0.44	5126	0.146	0.063187	0.107	1.026487	0.162	0.117822	0.075	0.837	714.52	2.28	717.17	0.83	718.01	0.51

(a) z1, z2 etc. are labels for single zircon grains or fragments annealed and chemically abraded after Mattinson (2005).

(b) Model Th/U ratio iteratively calculated from the radiogenic 208Pb/206Pb ratio and 206Pb/238U age.

(c) Pb* and Pbc represent radiogenic and common Pb, respectively; mol % 206Pb* with respect to radiogenic, blank and initial common Pb.

(d) Measured ratio corrected for spike and fractionation only. Fractionation estimated at 0.18 +/- 0.03 %/a.m.u. for Daly analyses, based on analysis of NBS-981 and NBS-982.

(e) Corrected for fractionation, spike, and common Pb; up to 1 pg of common Pb was assumed to be procedural blank: 206Pb/204Pb = 18.042 ± 0.61%; 207Pb/204Pb = 15.537 ± 0.52%; 208Pb/204Pb = 37.686 ± 0.63% (all uncertainties 1-sigma).

Excess over blank was assigned to initial common Pb, using the Stacey and Kramers (1975) two-stage Pb isotope evolution model at the nominal sample age.

(f) Errors are 2-sigma, propagated using the algorithms of Schmitz and Schoene (2007).

(g) Calculations are based on the decay constants of Jaffey et al. (1971). 206Pb/238U and 207Pb/206Pb ages corrected for initial disequilibrium in 230Th/238U using Th/U [magma] = 3.