GSA DATA REPOSITORY 2014372

From continent to intra-oceanic arc: zircon xenocrysts record the crustal evolution of the Solomon Island Arc

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METHODS AND ANALYTICAL TECHINQUES

Mineral separation

Mineral separation was carried out at the NERC Isotope Geosciences Laboratory (NIGL). The general stages after sample washing were jaw crushing, disc milling and sieving (<355 μm). Heavy minerals were concentrated using a Rodgers Table, Frantz electromagnetic separator and MI heavy liquids (diiodomethane). Extensive efforts to ensure cleanliness were maintained throughout. Heavy minerals were then handpicked in alcohol under a binocular microscope with attempts to retrieve the full zircon fraction. Zircons, rutile and titanite were mounted in epoxy and polished with ¼ μm diamond paste to near-equatorial sections.

The total mass of each sample used within the extractions was variable, and ranged from~1 kg for X008, ~4 kg for UM14B and UM13B, and ~6 kg for X002.

See *Reproducibility of results* section for further details on mineral separations

Zircon Imaging

Cathodoluminescence imaging of zircon internal structures in polished epoxy mounts was carried out at the University of Leicester using a Hitachi S-3600N scanning electron microscope with a GATAN PanaCL ellipsoidal mirror plate inserted. Operating conditions for the SEM were 15 kV, 50 μA and an 11-13 mm working distance.

U-Pb Geochronology

Zircons were analysed for U-Pb geochronology using a Nu Instruments Attom HR single-collector inductively coupled plasma mass spectrometer (HR-ICP-MS). Laser ablation was performed with a New Wave Research UP193ss laser ablation system, using a 'large-format' New Wave Research cell; this features a moveable cup with an ablation volume of ca. 3-4 cm^3, which combined with <1m tubing to the plasma torch leads to a washout time of < 1 second. The ablation parameters were a 25μm static spot, a repetition rate of 5Hz, a fluence of 1.5 to 2.5 j/cm^2, a 15 second washout period between analyses, and a 30 second ablation time. Tuning was adopted that gave a ThO of <0.4%, and UO of <0.1%. Data processing used the time-resolved function on the Nu Instuments' software, an in-house Excel spreadsheet for data reduction and error propagation, and Isoplot for data presentation (Ludwig, 2003). All data are plotted at the 2σ confidence interval.

The Nu Attom HR-ICP-MS is used in peak-jumping mode with measurement on a MassCom secondary electron multiplier. The following masses are measured in each sweep: ^{202}Hg, $^{204}Pb+Hg$, ^{206}Pb, ^{207}Pb, ^{208}Pb, ^{232}Th, and ^{235}U. Each data integration records 100 sweeps of the measured masses, which roughly equates to 0.22 seconds. Dwell times on each mass are 500μs on ^{207}Pb and ^{235}U, and 200μs on all other masses; the switching between masses takes 40μs. Since ^{235}U is measured, ^{238}U is calculated from ^{235}U *137.818.

A standard-sample-bracketing technique was used to correct the data, which involved calculation of normalization factors based on the of the measured/accepted value for the $^{207}Pb/^{206}Pb$ and $^{206}Pb/^{238}U$ ratios of a zircon reference material, analysed at regular intervals during each session; two other zircon reference materials were analysed during each session to check for accuracy and precision of the method. Since many of the zircons contained a small component of common lead, a correction was made so that accurate $^{206}Pb/^{238}U$ ages could be given for the young (<600 Ma) zircons. A ^{207}Pb based correction was used, that utilizes the measured $^{207}Pb/^{206}Pb$ ratios, and an assumed $^{207}Pb/^{206}Pb$ ratio of common lead to calculate the proportion of common ^{206}Pb; this correction assumes that the U-Pb data are concordant, but is useful in young grains where accurate knowledge of the $^{206}Pb/^{238}U$ is required. For common lead, the Stacey & Kramers (1975) model composition is used, and an initial age estimate is based on regression in a Tera-Wasserburg diagram. A correction is also made to the common-lead corrected ages to account for any deficit in ^{206}Pb that is derived from the initial exclusion of ^{230}Th, an intermediate daughter nuclide of the ^{238}U decay series, during zircon crystallisation. This correction is relatively minor in zircon, titanite and rutile, because Th/U ratios are low; above ages of 10 Ma the correction is <1%, and above 100 Ma is < 0.02%. An estimated value of 3 was used for the melt Th/U ratio in this case.

Propagated uncertainties include the internal uncertainty, i.e. the reproducibility of the measured ratios during an ablation, and an external uncertainty, i.e. the reproducibility of the bracketing reference material during a session; these were added in quadrature.

Titanite and rutile were measured using the same protocol as for zircon; normalisation involved standard bracketing with matrix-matched reference materials.

Standards									
Date	**Material**	**1° standard**	**Pb/U 2sd%**	**2° standard**	**Pb/U age**	**Pb/U 2sd%**	**3° standard**	**Pb/U age**	**Pb/U 2sd%**
25/06/2012	Zircon	91500	3.0	GJ-1	602 ± 14	2.3	Mud Tank	736 ± 25	3.4
26/06/2012	Zircon	91500	2.9	GJ-2	602 ± 16	2.6	Mud Tank	736 ± 22	3.0
27/06/2012	Zircon	91500	2.7	GJ-3	604 ± 26	4.3	Mud Tank	745 ± 21	2.8
06/08/2012	Zircon	91500	2.4	GJ-4	604 ± 10	1.6	Mud Tank	733 ± 15	2.0
07/08/2012	Zircon	91500	2.9	GJ-5	604 ± 12	2.1	Mud Tank	730 ± 19	2.6
08/08/2012	Zircon	91500	2.5	GJ-6	603 ± 14	2.2	Mud Tank	731 ± 20	2.7
08/08/2012	Rutile	R10	3.4	R19	488 ± 24	4.9			
08/08/2012	Titanite	Ont2	2.0	Khan	525 ± 15	2.9			

Laboratory & Sample Preparation	
Laboratory name	NERC Isotope Geosciences Laboratory
Sample type/mineral	Zircon, titanite, rutile
Sample preparation	Conventional mineral separation, 1 inch resin mount, 1/4μm polish to finish
Imaging	Cathodoluminescence
Laser ablation system	
Make, Model & type	ESI/New Wave Research, UP193SS
Ablation cell & volume	NWR two-volume 'large format cell' with low effective volume (ca. 3-4cm^3), washout time ca.1sec
Laser wavelength (nm)	193nm
Pulse width (ns)	3-4ns
Fluence (J.cm^{-2})	1.5-2.5 J.cm^{-2}
Repetition rate (Hz)	5Hz
Ablation duration (secs)	30secs
Ablation pit depth / ablation rate	~15μm pit depth, measured using an optical microscope
Spot size (μm)	25μm
Sampling mode / pattern	Static spot ablation
Carrier gas	100% He, Ar make-up gas combined ca.50% along sample line.
Cell carrier gas flow (l/min)	0.7l/min
ICP-MS Instrument	
Make, Model & type	Nu Instruments Attom SC-SF-ICP-MS
Sample introduction	Free air aspiration of desolvator
RF power (W)	1300W
Make-up gas flow (l/min)	0.8l/min Ar
Detection system	Discrete dynode MassCom ion counter
Masses measured	202, 204, 206, 207, 208, 232, 235
Integration time per peak (ms)	Ca.200ms
Total integration time per reading (secs)	Ca.1 sec
Sensitivity / Efficiency (%, element)	Not measured
IC Dead time (ns)	15ns
Data Processing	
Gas blank	60 second on-peak zero subtracted
Calibration strategy	91500, GJ1 & Mud Tank (zircon); Ontario-2 & Khan (titanite); R10 & R19 (rutile). One used as primary reference material for normalization, and others used as check on accuracy.
Reference Material info	91500 (1065 Ma; Wiedenbeck et al. 1995) Mud Tank (732 ± 1 Ma; in-house TIMS) GJ1 (^{206}Pb/^{238}U 602.3 ± 1Ma, ^{207}Pb/^{206}Pb 609.2 ± 0.7Ma; in-house TIMS, – see also Jackson et al. 2004) Ontario-2 (1054 ± 2 Ma; in-house TIMS) Khan (522 Ma; in-house TIMS) R10 (1089 ± 2 Ma; in-house TIMS, – see also Luvizotto et al. 2011) R19 (489 ± 0.9 Ma; Zack et al. 2011)
Data processing package used / Correction for LIEF	Nu Instruments TRA acquisition software, in-house spreadsheet data processing
Mass discrimination	^{207}Pb/^{206}Pb and ^{206}Pb/^{238}U normalised to reference material
Common-Pb correction, composition and uncertainty	Stacey & Kramers (1975) model composition, based on f206c, using estimated age derived from ^{206}Pb/^{238}U.
Uncertainty level & propagation	Ages in the data table are quoted at 2sigma absolute, propagation is by quadratic addition. Reproducibility of reference material is propagated.
Quality control / Validation	See data table for validation results

Critically appraising the risk of contamination

Given the nature of the findings, the risk of laboratory contamination (addition of external zircon crystals unrelated to the samples before U-Pb analysis) is a concern and requires critical appraisal.

Immediately upon the disaggregation of a whole rock sample through geological or anthropogenic means, the risk of contamination is introduced and can never be eliminated no matter what precautions are taken. This risk concerns all crystals regardless of their age, although a greater weighting of confidence may be placed in dates that are in agreement with the expected age of a sample, e.g. a magmatic emplacement age. Unlike the zircons of our study, xenocrysts are commonly identified as older cores with younger rims that correspond in age to their associated intrusion, giving confidence to a relationship between the magmatic system and the source of older zircons. However, the absence of rims alone does not signify contamination. Natural samples within magmatic systems which display both populations of young grains and xenocrystic zircons without young rims have been previously observed in an island arc setting (Reddy et al., 2009). Enclaving of zircons in xenoliths, refractory xenocrysts and minerals that crystallising from magma prior to zircon saturation may all prohibit the growth of young zircon rims growing around old cores or their complete dissolution into the melt.

The small, heavily vegetated, tropically weathered and hydrothermally altered exposures in the Umasani area placed severe constraints on the identification of features that appear foreign in hand sample or thin section. Basaltic xenoliths were observed at the sample location of X002 and have been previously been described within early intrusive phases of the Umasani and Poha plutonic complexes (Hackman, 1979). However, further detailed investigations are needed to ascertain xenolith affinity and if they bear xenocrysts.

Only by identifying the full range in zircon age populations truly in-situ (i.e. prior to disaggregation), can the risk of contamination be entirely negated. However, in many instances a grain by grain, in-situ analysis of thin section zircons is unfeasible owing to the relatively sparse nature of accessory zircon in natural samples (in particular xenocrystic zircon in this instance) and the low volume of rock that can be intensively examined. From the ~15 kg of bulk rock that was processed within this study, only ~100 xenocrysts were identified. The number of initial xenocrysts may well exceed this; yet the low zircon yield is a reflection upon the low density within the initial sample. Heterogeneity in the physical distribution of zircons and their ages may also occur within the bulk rock on a scale not resolvable within thin section. The poor representation of zircons in a thin section may therefore lead to a deficit of geological complexity from the resulting geochronology of a sample. In part, this is why processing high volume samples through heavy mineral separations is commonly more favourable for producing representative U-Pb ages for a rock.

Methods bias in the age frequency distribution

Even within high volume samples, initial bias of zircon analysed U-Pb dates may be introduced by natural heterogeneities within a sample selected for mineral separation. These include the variation in concentration and distributions of zircon age populations and the volume of whole rock used.

Traditional heavy mineral separation methods are not closed systems. Rather, they concentrate heavy minerals, thus different size and morphological fractions may be preferentially lost during their processing (c.f. Sláma and Košler, 2012). The liberation of zircon grains from bulk rock using crushing techniques adds an additional factor of bias in comparison to detrital zircon mineral extractions from unconsolidated sediment samples.

Human selection bias during hand picking under a binocular microscope may also have considerable impact on the ages of the final zircons analysed in preference of those with larger grain sizes (e.g. Sláma and Košler, 2012). While we made every attempt to retrieve the full zircon fraction no guarantee can be made to the extent of missed grains or those lost during transfer and mounting.

It is in our opinion that the frequency distribution of age data for a given sample is not necessarily representative of the age frequency distributions of the initial zircon population. The age distribution is perhaps more reliable, although the absence of zircon dates does not necessarily indicate the absence of that age of zircons from the samples or the crust of Guadalcanal.

Reproducibility of results

As the possibility of sample contamination can never be entirely ruled out from a heavy mineral separate, an important test is the ability to independently reproduce age results. In discussing the origins of zircon xenocrysts within the Arabian-Nubian Shield, Stern et al. (2010) present the reproducibility of xenocryst grain ages from heavy mineral separations in three different laboratories as the core argument against a laboratory contamination source. We have ensured reproducibility within our results across several relevant points, which we describe below with further details of mineral separation methodology.

Heavy minerals were first extracted from sample X002. The initial separation yielded only several zircons visible under a binocular microscope and warranted re-sampling from the field. Zircons were extracted from a second, larger hand sample of X002 during the same run of samples as an aliquot of UM13B (UM13B-1). On both occasions samples were passed twice across a Rodgers Table before Frantz and heavy liquid separation. The zircons yielded by the two extractions of X002 were mixed before mounting in epoxy.

Nine months after extractions of X002 and UM13B-1, we processed samples UM14B, X008 and a second aliquot of UM13B (UM13B-2). Aliquots of UM13B remained isolated from each other throughout all stages.

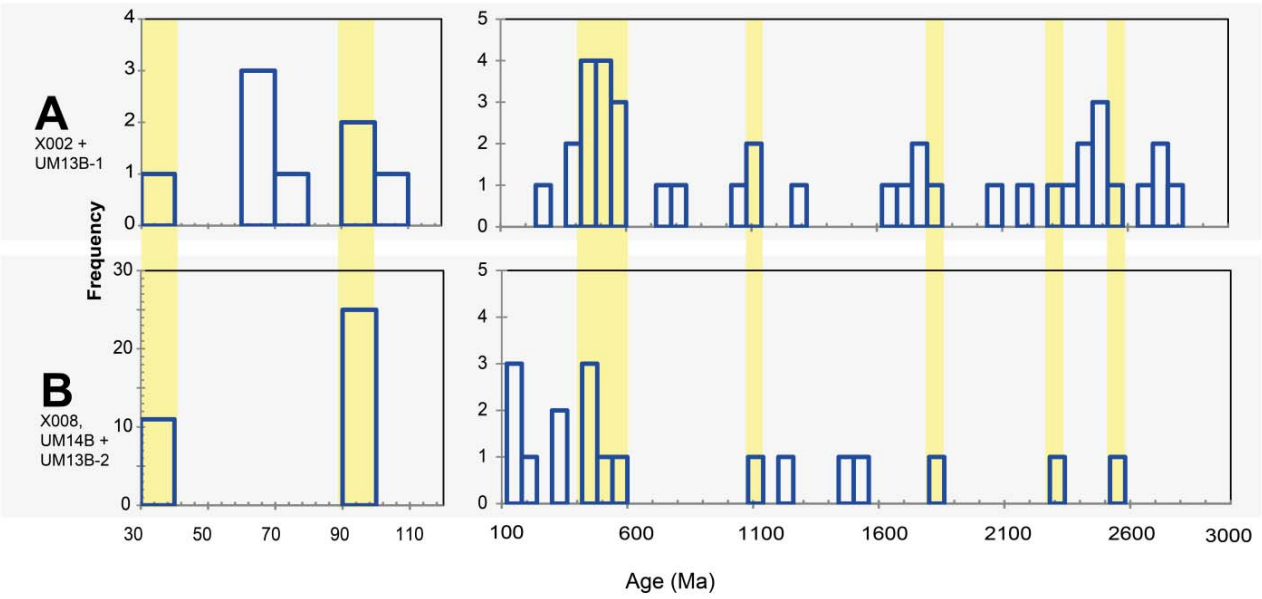
In order to avoid the possibility of zircon adhered to the external surfaces, samples of X008, UM14B and UM13B-2 were thoroughly washed and sealed until crushing. Crushing apparatus was cleaned to the high standards maintained throughout procedures, and a portion of UM14B was used to self-contaminate all crushing and sieving equipment before being discarded. The sample of UM14B from which we analysed zircons from, was then processed and apparatus was again cleaned between each of the following sample runs of X008 and UM13B-2. To maximise the zircon yield, samples were passed only once over the Rodger's Table before concentration using a Frantz electromagnetic separator and heavy liquids.

During the two sessions of mineral separation in November 2011 and July 2012 an additional 23 samples from Miocene or younger igneous units of the Solomon Islands were also processed using the same methods and apparatus. These samples either bracketed or occurred as intervals between runs of the Umasani samples of this study, and therefore act as controls within our experiments.

The temporal gap between sessions of heavy mineral separation creates some independence between experiments. Figure 1 shows ages across the spectra were reproduced by the mineral extractions after a 9 month period. Zircon dates older than Oligocene, occurred in both aliquots of UM13B that were independently separated.

The large range in ages that were reproduced during both separations also indicates that if zircons were an artefact of contamination it would be unlikely to be derived from a single contaminant source; therefore persistent laboratory contamination from a similar mixture of samples would need to be present over this 9 month time period.

If persistent contamination occurred over a prolonged period we may expect similar ages of zircons to be present throughout the additional 23 samples that bracketed xenocryst bearing samples in the run of separations, they are not. Of 16 other bulk samples prepared and analysed during the same November 2011 and July 2012 sessions as xenocryst bearing samples (>600 zircon CL images and >300 individual LA-ICP-MS U-Pb analyses) no similar internal textures were identified and all returned ages younger than the zircons discussed within this study. It is noteworthy, given a possible bias during hand picking, that these analyses include grains of a similar size fraction to xenocrysts zircons. In a further 7 samples, zircon was either completely absent (blanks) or gave low zircon yields (<20 grains) which are optically different from the xenocrystic grains under a binocular microscope. Zircon grains older than the Oligocene were only identified in the heavy mineral separates of the same litho-chemical intrusive unit from the Umasani area.



Age frequency distributions of xenocrysts identified in mineral separations conducted in (A) August and November 2011 and (B) July 2012. Reoccurring zircon dates are highlighted in yellow. Reproducibility of zircon dates occurs throughout the age spectrum.

Additionally, Umasani samples processed within in the same session of extraction did not yield the same age distribution. The clearest example is of the July 2012 extraction from which X008 only yielded one Eocene aged grain, whereas UM14B and UM13B-2 which bracketed X008 yielded much older grains (Fig. DR3, Table DR2). It is difficult to reconcile persistent laboratory contamination over 9 months with the intermittent occurrence of older zircons from one sample to the next, and the selective contamination of samples from the same intrusive complex only.

As a further test, the remaining hand sample material of X002 was processed in April 2013. To decrease the risk of contamination from crushing equipment, a ~5 cm diameter tightly fitting tungsten carbide piston and hammer was used to crush the sample from hand sample to powder. Before contact with the sample, the piston was thoroughly cleaned and its inner surfaces were examined under a binocular microscope to ensure it was free from residual material. The sample was sieved to <355 μm. Fines were removed by washing the sample in a 5L glass beaker rather than Rodger's table, before electromagnetic and heavy liquid separation. Importantly, a Pliocene gabbro control sample containing Zr 8 ppm (XRF analysis, unpublished data) was processed through each stage of the separation immediately before X002 (apparatus was thoroughly cleaned in between samples).

Unmounted zircon from the April 2013 extraction of X002 again yielded 3 zircons with Archean, Proterozoic and Late Cretaceous dates (data are not included within the presented data set and are available upon request from the corresponding author). The heavy mineral separate of the Pliocene gabbro control (processed through the apparatus first) showed no evidence of zircon under the same optical microscope conditions as X002. We deem this as further evidence that the older zircons are xenocrysts contained within the Umasani samples.

While the possibility of contamination cannot be refuted, the procedures and reproducibility ensure a high level of confidence in the results not being an artefact of laboratory contamination.

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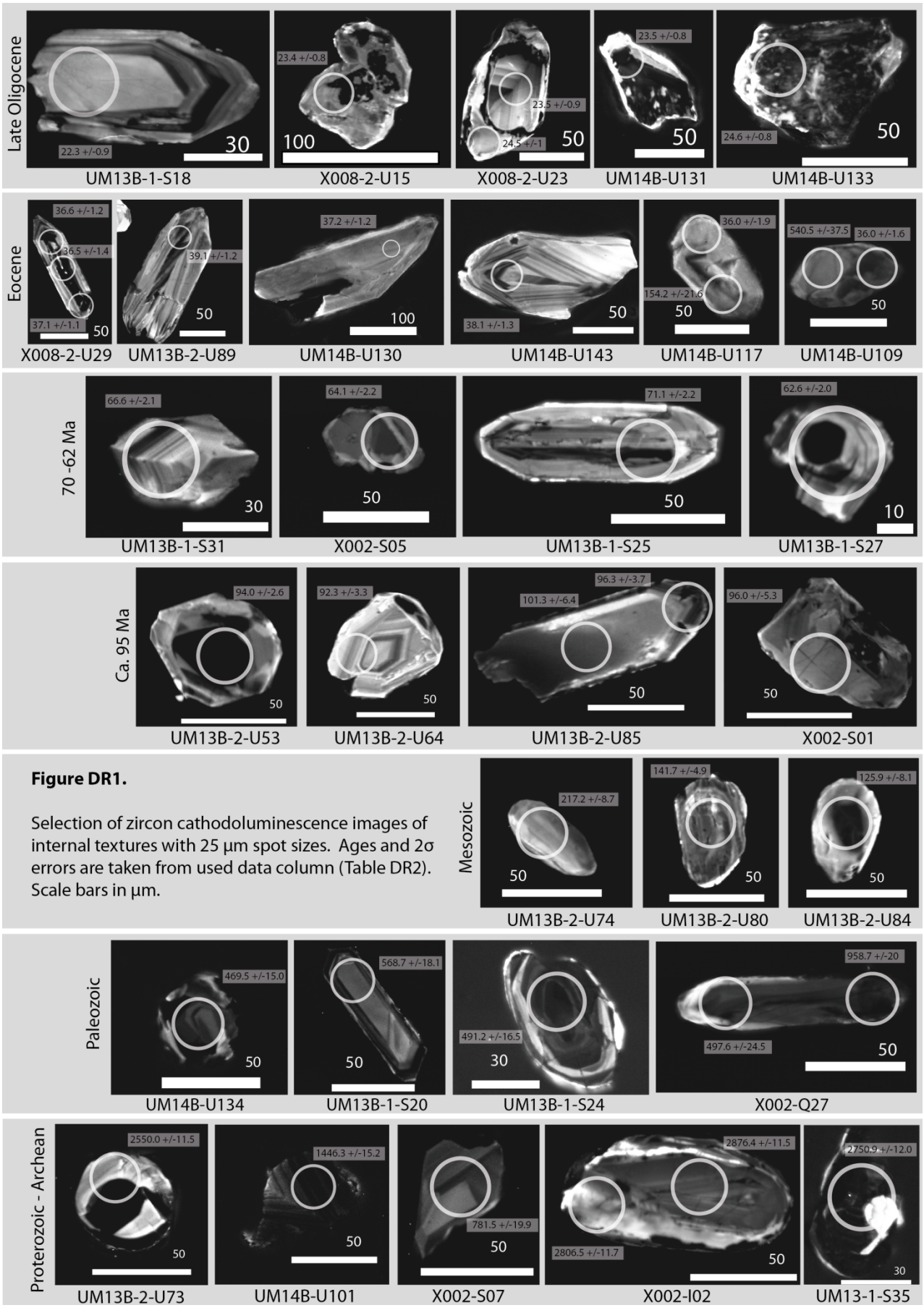

Figure DR1.

Selection of zircon cathodoluminescence images of internal textures with 25 µm spot sizes. Ages and 2σ errors are taken from used data column (Table DR2). Scale bars in µm.

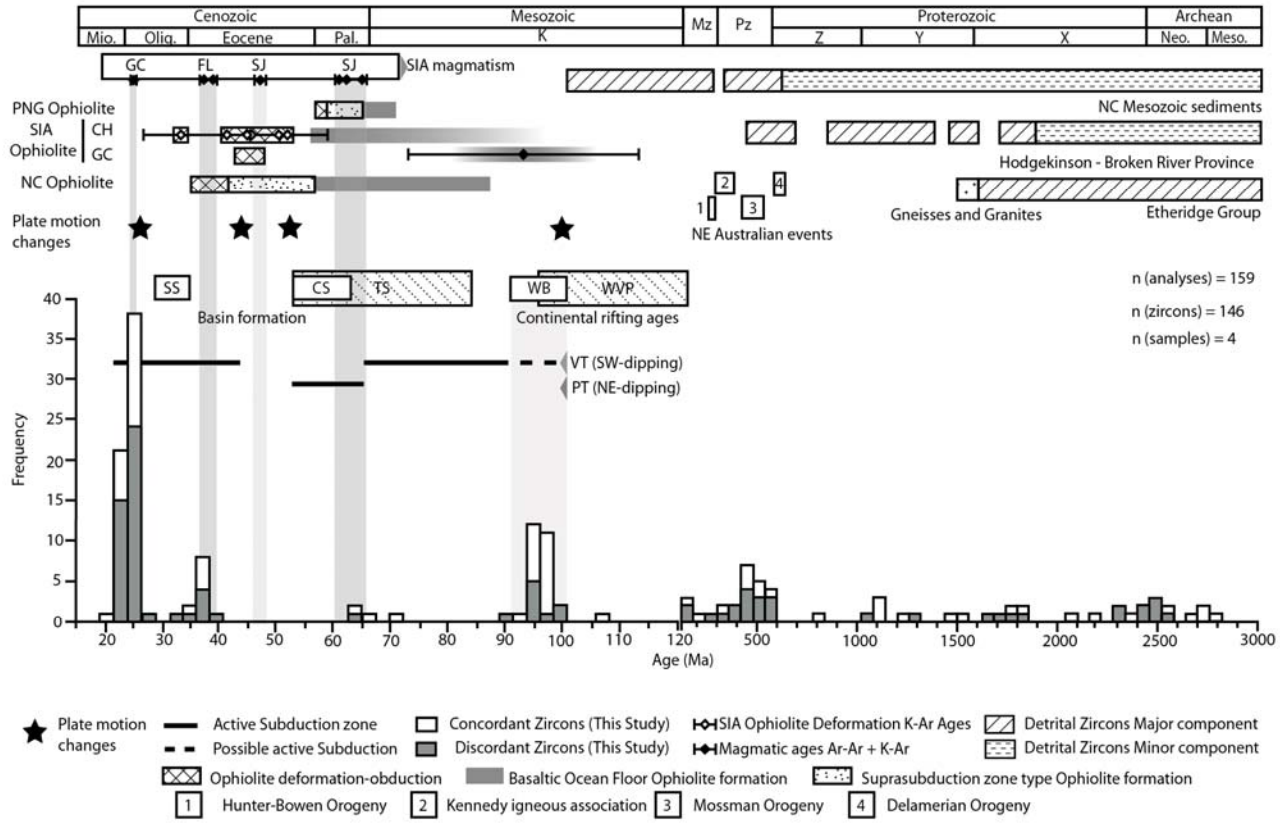

Figure DR2**.** Frequency histogram of zircon ages from the Umasani Pluton and extended summary of corresponding regional tectonic events and zircon ages. Inherited ages in the arc are similar to NE Australian and New Caledonian detrital zircons >120 Ma and the ages for magmatic arc units that alternate with basin formation since the Late Cretaceous continental rifting events. Concordant ages (>90% concordance), discordant ages (<90% concordance). Histogram bins <120 Ma represent 2 Ma, >120 Ma bins represent 60 Ma. $^{206}Pb/^{238}U$ Ages are used for <600 Ma, $^{207}Pb/^{206}Pb$ ages are used for older zircons.

Abbreviations: CH - Choiseul Island; CS - Coral Sea; FL - Florida Islands; GC - Guadalcanal; LHR - Lord Howe Rise; LP - Louisiade Plateau; NC - New Caledonia; OJP - Ontong Java Plateau; PNG – Papua New Guinea; PT - Pocklington Trough relict subduction zone; SIA - Solomon Island Arc; SJ - San Jorge Volcanics (contained within the Jajao igneous complex - JJ); SS - Solomon Sea; TS - Tasman Sea; VT - Vitiaz Trench; WB - Woodlark Basin. WVP - Whitsunday Volcanic Province.

Presented ages of events in overlay are as follows:

Guadalcanal ophiolite formation 92 ± 20 Ma (K-Ar; Snelling et al., 1970) and stratigraphic mid-Eocene deformation ages (Hackman 1980). Choiseul Island ophiolite formation stratigraphic age (Ridgway et al., 1987) and range of deformation K-Ar ages (Richards and Cooper, 1966).

Timings for the formation and emplacement of the Papua New Guinea and New Caledonian ophiolite (Whattam et al., 2008 and references therein; Whattam, 2009 and references therein). Note that the deformation ages for the Solomon Island Arc ophiolite deformation lies in between

that of PNG and New Caledonia, in keeping with the southwards younging disrupted ophiolite belt of Parrot and Dugas (1980) and Whattam (2009). Within the other cases of ophiolite formation along the SW Pacific margin, Whattam (2009) identifies that the genesis of ophiolite crust occurs in a supra-subduction zone environment, following formation in a back-arc basin environment represented by the basaltic ocean floor symbol. Emplacement of both types of basaltic crust as ophiolite occurs due to the partial subduction and rebound of micro-continental ribbons at short lived N to E dipping subduction zones.

Spreading ages of the Solomon Sea (magnetic anomalies; Joshima et al., 1986) and Coral Sea (magnetic anomalies; Weissel and Watts, 1979; Gaina et al., 1999). Ages for continental rift related magmatism associated with the break-up of Eastern Gondwana are for the Whitsunday Volcanic Province, 132–95 Ma (Rb-Sr and K-Ar; Bryan et al., 1997 and references therein.) and 100–90 Ma zircons from the Woodlark Basin rift (U-Pb; Zirakparvar et al., 2013). Tasman Sea spreading (Schellart et al., 2006 and references therein.).

Ages of Solomon Island Arc magmatism are for arc-BAB San Jorge Volcanics of the Jajao Igneous complex 61–64 Ma and 46 Ma (Ar-Ar; Tejada et al., 1996), Florida Island volcanic basement sequence including gabbros and tonalites at 45–37 Ma (K-Ar; Neef and McDougall, 1976) and the Poha tonalite 24.4 ± 0.4 Ma (K-Ar; Chivas and Mcdougall, 1978).

Subduction zone activity for the Vitiaz trench and Pocklington Trough (Schellart et al., 2006; Whattam et al., 2008; Whattam, 2009 and references therein.).

Plate motion changes are at 26–23 Ma (Knesel et al., 2008), 43 Ma and 99 Ma (Veevers, 2000), and 53–50 Ma (Whittaker et al., 2007). Note that continental rifting and the onset of extensional ophiolite crust formation is preceeded by major tectonic change, just as the ophiolite deformation in the SIA is bracketed by two major tectonic reorganisation events.

Ages for zircon forming North-Eastern Australian orogenies and events (Withnall and Henderson, 2012). Detrital zircon age ranges from Teremba, Boghen and Central Mesozoic terrane sediments of New Caledonia (Adams et al., 2009); Hodgkinson-Broken River Provinces (Fergusson et al., 2007); Etheridge Group Metasediments and granites and gneiss ages within the area (Neumann and Kositcin, 2011). Major detrital component refers to dominant peaks in probability density functions where as minor component indicates dates or uncertainties present across the age range.

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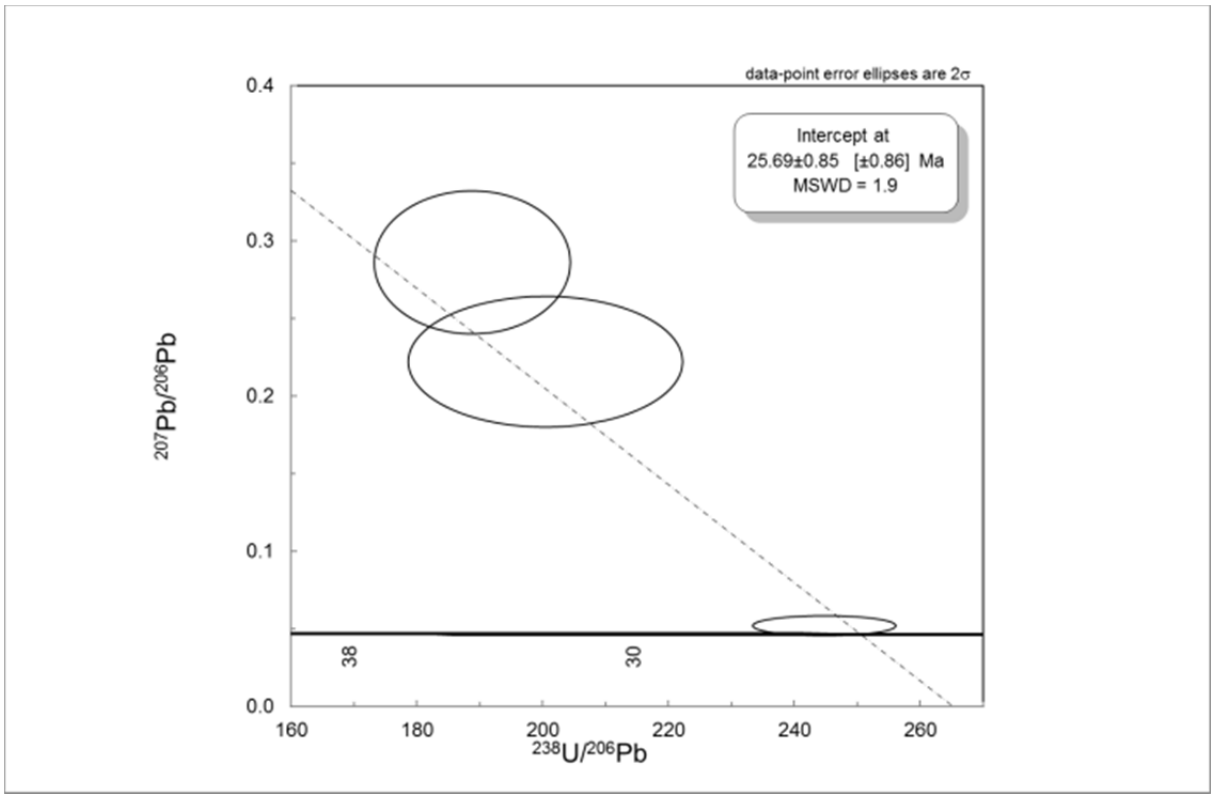
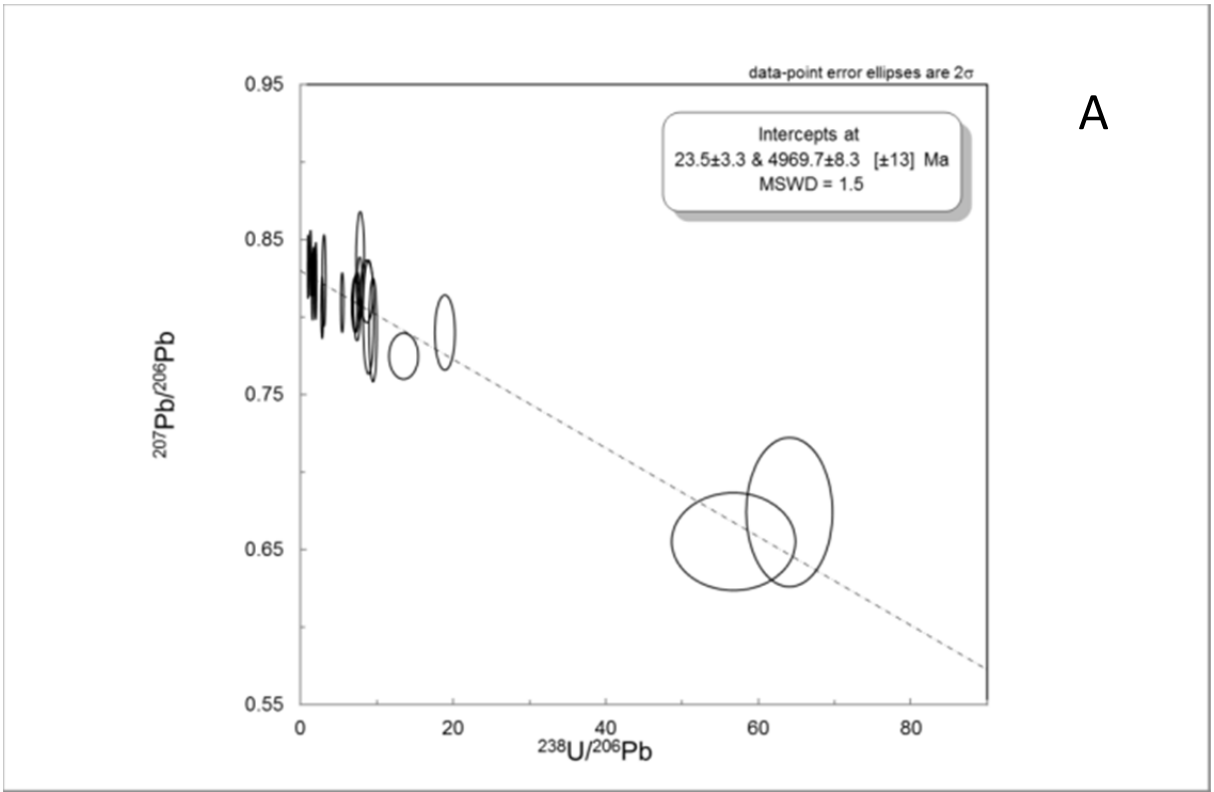
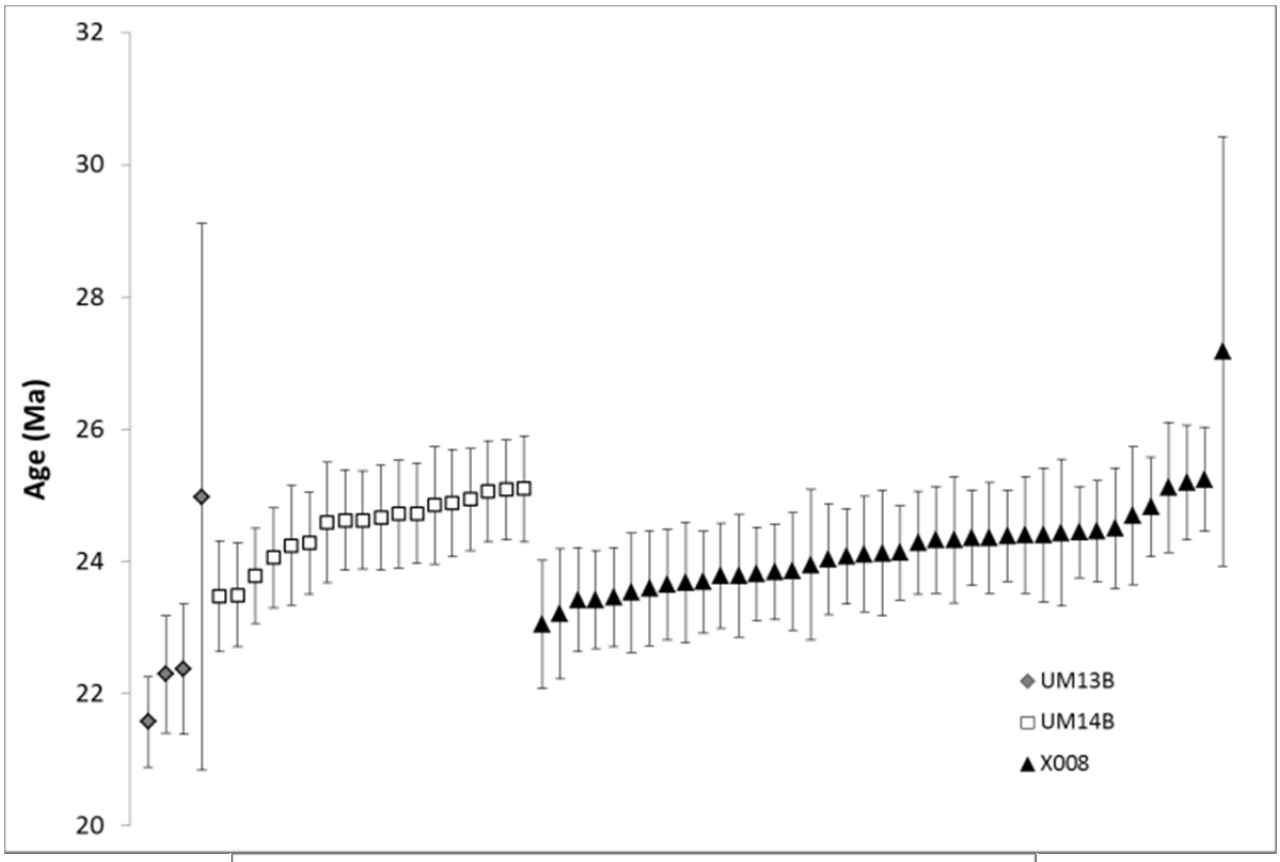
FIGURE DR3

All errors plotted at the 2σ confidence interval and all data taken from Table DR2
A: Tera Wasserburg diagram for sample X002 titanite U-Pb data.
B: Tera Wasserburg diagram for sample UM13B rutile U-Pb data.
C: U-Pb zircon age distributions for magmatic emplacement populations.
D: U-Pb zircon age distributions for ca 95 Ma populations.
E: Individual sample zircon age frequency histograms

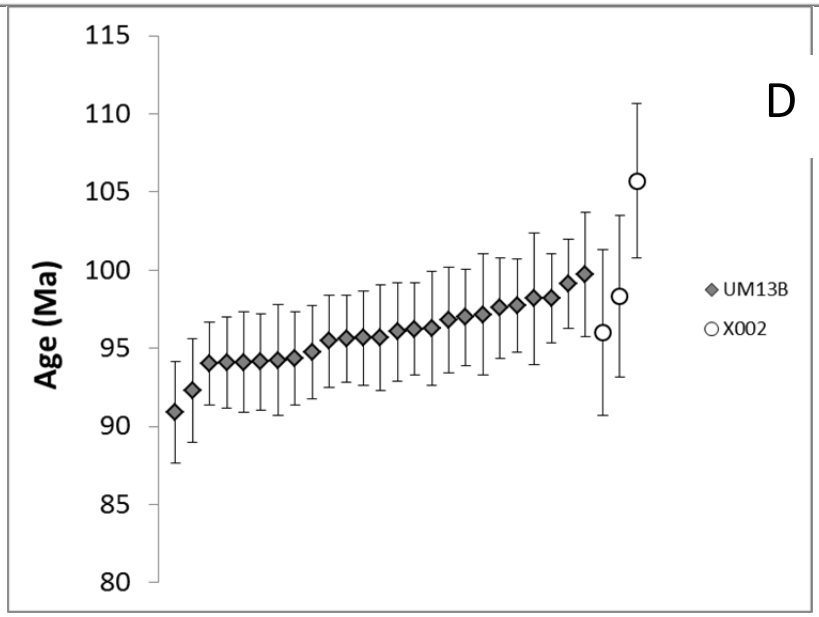


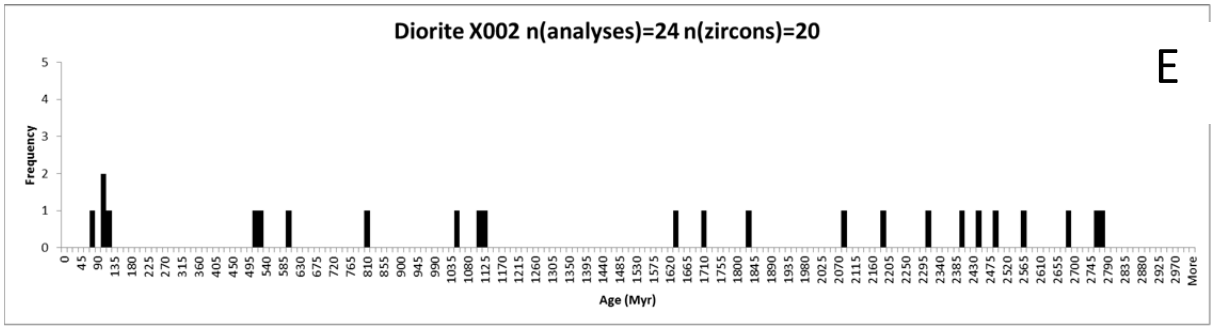


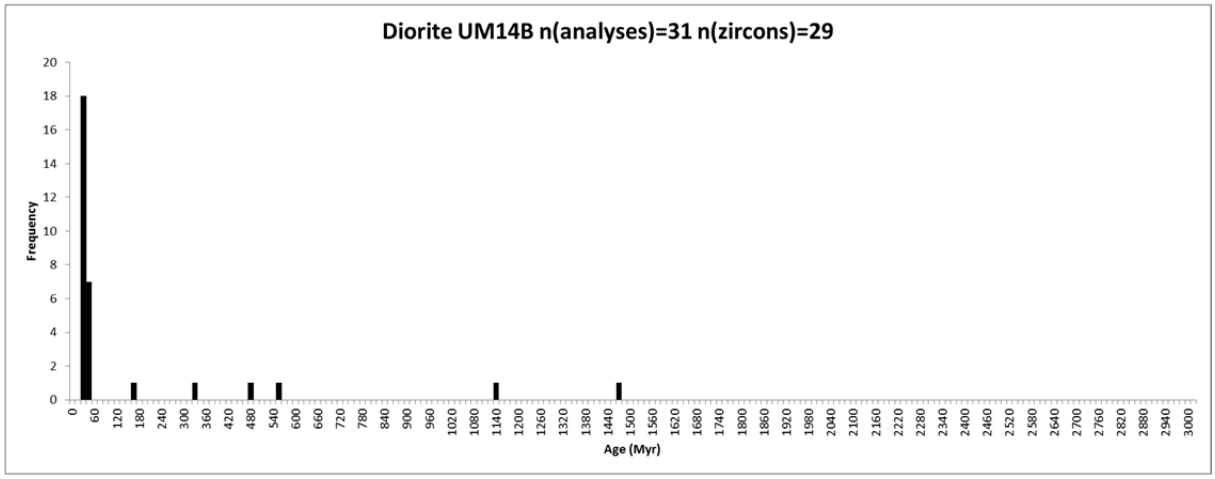
C

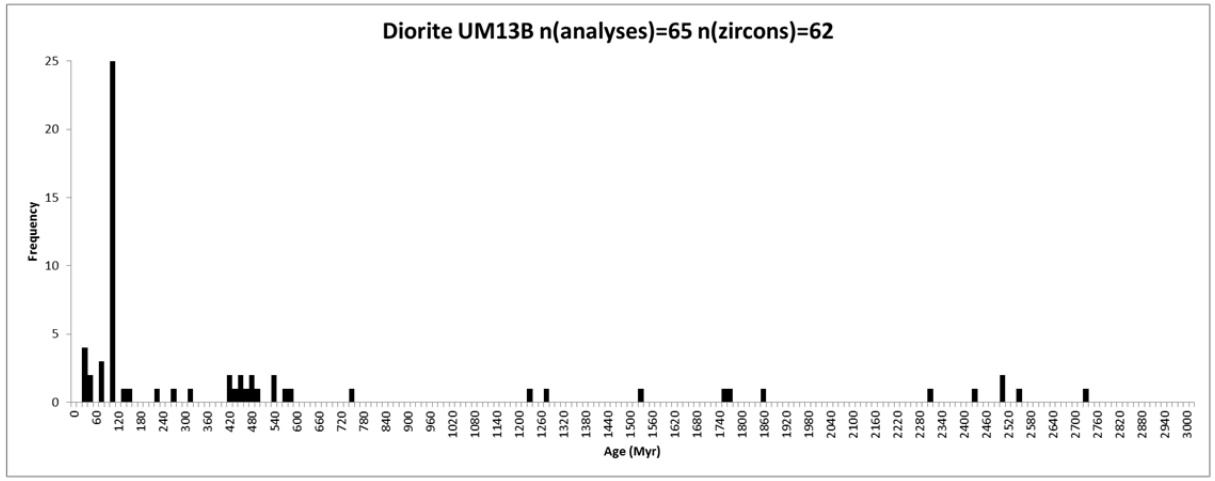

32
30
28
26
24
22
20
Age (Ma)
UM13B
UM14B
X008

D


115
110
105
100
95
90
85
80
Age (Ma)
UM13B
X002


Diorite X002 n(analyses)=24 n(zircons)=20
E
Frequency
Age (Myr)


Diorite UM14B n(analyses)=31 n(zircons)=29
Frequency
Age (Myr)


Diorite UM13B n(analyses)=65 n(zircons)=62
Frequency
Age (Myr)

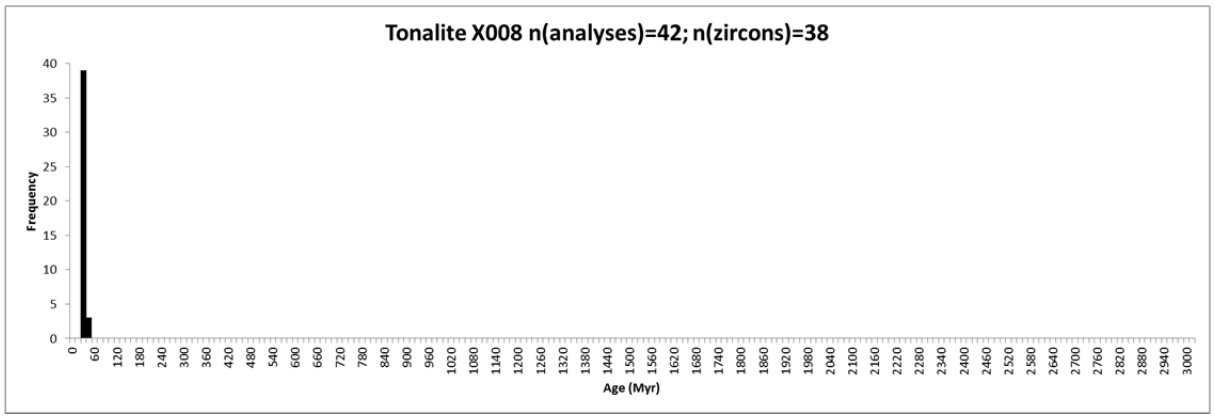

Tonalite X008 n(analyses)=42; n(zircons)=38
Frequency
Age (Myr)

TABLE DR1. Umasani plutonic complex sample details

Sample Name	UTM N	UTM E	Longitude -E (Decimal)	Lattitude -S (Decimal)	Rock Type	Alteration	Mineral Phase	Zircons Analysed	Number of Analyses
X002	8961802	584157	159.7664819	-9.39123171	Diorite	Pervasive Chlorite-epidote-albite-pyrite	Zircon + Titante	20	24
UM13B	8961873	581904	159.7459619	-9.390633476	Diorite	Pervasive Chlorite-epidote-albite-pyrite	Zircon + Rutile	62	65
UM14B	8961882	581898	159.7459071	-9.390552195	Diorite	K-felspar halos, Pervasive Chlorite-epidote-albite-pyrite	Zircon	29	31
X008	8962194	583340	159.7590335	-9.387702481	Micro-tonalite	Weak pervasive chlorite	Zircon	38	42

TABLE DR2. Full data table for all U-Th-Pb analyses

Date	Sample	^{204}Pb	f206c	^{206}Pb	^{207}Pb	^{208}Pb	^{232}Th	^{235}U	Th/U	Pb	Th	U	^{207}Pb/^{206}Pb	1σ	^{207}Pb/^{235}U	1σ	^{206}Pb/^{238}U	1σ	Rho	^{207}Pb/^{206}Pb	2σ	^{206}Pb/^{238}U	2σ	^{207}Pb/^{235}U	2σ	Disc. %	Disc. %	^{206}Pb/^{238}U	2σ	Used age	2σ	<10% Disconcordant?
		cps		cps	cps	cps	cps	cps		ppm	ppm	ppm		%		%		%		Ma	Ma	Ma	Ma	Ma	Ma	6-38/7-6	6-38/7-35	Cm-Pb corrected	Ma	Ma	Ma	
	UM13B -Zircon																															
07/08/2012	UM13B-1-S16	-87	0.00	231821	15288	69966	1234896	16439	0.9	52.6	408	431	0.0655	0.78	1.0892	1.98	0.1206	1.82	0.92	789.9	16.5	734.2	25.2	748.1	20.7	7.1	1.9	733	28.16	748.1	20.7	<10%
07/08/2012	UM13B-1-S17	-20	0.03	229499	18702	34453	379990	29611	0.2	52.1	125	777	0.0817	2.01	0.8611	6.76	0.0765	6.45	0.95	1237.9	39.5	474.9	58.8	630.7	61.6	61.6	24.7	460	61.24	460	61.24	>10%
07/08/2012	UM13B-1-S18	31	0.05	2316	203	602	260303	5495	0.6	0.5	86	144	0.0863	4.53	0.0432	4.95	0.0036	2.01	0.41	1344.9	87.4	23.4	0.9	43.0	4.2	98.3	45.6	22	0.89	22	0.89	>10%
07/08/2012	UM13B-1-S19	37	0.00	95863	5346	26284	880499	11932	0.9	21.7	291	313	0.0560	0.91	0.5239	1.80	0.0678	1.56	0.86	452.7	20.1	423.2	12.8	427.8	12.5	6.5	1.1	423	13.63	423	13.63	<10%
07/08/2012	UM13B-1-S20	-53	0.00	230582	13823	18530	494404	21370	0.3	52.3	163	561	0.0597	0.60	0.7601	1.63	0.0923	1.52	0.93	594.1	12.9	569.0	16.5	574.1	14.2	4.2	0.9	569	18.06	569	18.06	<10%
07/08/2012	UM13B-1-S21	-44	0.01	662845	73958	20750	177414	18537	0.1	150.4	59	486	0.1120	0.64	4.6983	1.64	0.3042	1.51	0.92	1832.5	11.5	1712.0	45.2	1766.9	27.0	6.6	3.1	1697	58.47	1766.9	27.0	<10%
07/08/2012	UM13B-1-S22	55	0.05	12936	1116	3401	970162	20851	0.6	2.9	320	547	0.0844	2.92	0.0618	3.33	0.0053	1.59	0.48	1301.1	56.8	34.1	1.1	60.9	3.9	97.4	43.9	33	1.04	33	1.04	>10%
07/08/2012	UM13B-1-S23	21412	0.63	643842	355410	884963	575168	28374	0.3	146.0	190	744	0.5479	1.90	14.4926	3.41	0.1918	2.84	0.83	4375.6	27.7	1131.3	58.6	2782.5	62.8	74.1	59.3	447	26.92	447	26.92	>10%
07/08/2012	UM13B-1-S24	3038	0.12	430324	66901	142266	901479	41249	0.3	97.6	298	1082	0.1503	2.44	1.8593	2.92	0.0897	1.61	0.55	2348.8	41.7	554.1	17.1	1066.8	37.9	76.4	48.1	491	16.51	491	16.51	>10%
07/08/2012	UM13B-1-S25	-26	0.00	32980	1679	1872	354371	25539	0.2	7.5	117	670	0.0498	1.43	0.0762	2.11	0.0111	1.55	0.74	183.6	33.2	71.2	2.2	74.6	3.0	61.2	4.5	71	2.21	71	2.21	<10%
07/08/2012	UM13B-1-S26	-27	0.02	1664	103	428	240825	3951	0.8	0.4	80	104	0.0643	5.94	0.0314	6.34	0.0035	2.21	0.35	753.0	125.4	22.8	1.0	31.4	3.9	97.0	27.4	22	0.99	22	0.99	>10%
07/08/2012	UM13B-1-S27	-41	0.01	25050	1294	7863	1569130	21096	0.9	5.7	518	554	0.0517	1.60	0.0699	2.23	0.0098	1.55	0.69	271.3	36.8	62.9	1.9	68.6	3.0	76.8	8.3	63	1.95	63	1.95	<10%
07/08/2012	UM13B-1-S28	1379	0.04	708545	60479	73234	640281	87278	0.1	160.7	211	2290	0.0850	2.01	0.8047	2.51	0.0687	1.50	0.60	1315.1	39.1	428.2	12.4	599.5	22.5	67.4	28.6	413	12.76	413	12.76	>10%
07/08/2012	UM13B-1-S29	371	0.11	298189	59458	37756	90247	6849	0.2	67.6	30	180	0.1973	0.76	9.8671	3.08	0.3628	2.99	0.97	2803.7	12.4	1995.3	101.7	2422.4	55.3	28.8	17.6	1808	123.75	2422.4	55.3	>10%
07/08/2012	UM13B-1-S30	117	0.01	50364	3094	8175	240736	5550	0.5	11.4	80	146	0.0620	1.13	0.6486	2.43	0.0758	2.16	0.89	675.3	24.1	471.2	19.6	507.6	19.3	30.2	7.2	468	20.92	468	20.92	>10%
07/08/2012	UM13B-1-S31	-44	0.00	41085	2021	3705	775844	33448	0.3	9.3	256	878	0.0487	1.20	0.0697	2.00	0.0104	1.59	0.80	132.4	28.3	66.6	2.1	68.4	2.6	49.7	2.7	67	2.13	67	2.13	<10%
07/08/2012	UM13B-1-S32	288	0.05	955687	174624	90304	474994	18892	0.3	216.8	157	496	0.1809	0.68	10.6563	1.74	0.4273	1.60	0.92	2660.9	11.3	2293.5	61.6	2493.6	31.8	13.8	8.0	2189	83.89	2493.6	31.8	>10%
07/08/2012	UM13B-1-S33	11960	0.53	423992	200402	468658	204014	25156	0.1	96.2	67	660	0.4690	0.89	9.1634	1.89	0.1417	1.67	0.88	4146.6	13.2	854.3	26.6	2354.5	34.1	79.4	63.7	420	15.29	420	15.29	>10%
07/08/2012	UM13B-1-S35	107	0.08	574347	110391	76190	393968	12079	0.4	130.3	130	317	0.1910	0.73	10.6429	1.74	0.4041	1.57	0.91	2750.9	12.0	2187.9	58.1	2492.5	31.7	20.5	12.2	2037	75.75	2492.5	31.7	>10%
07/08/2012	UM13B-1-S36	120	0.03	285561	57178	18866	94820	4965	0.2	64.8	31	130	0.1970	1.08	13.5910	2.66	0.5005	2.43	0.91	2801.1	17.7	2615.8	103.5	2721.6	49.0	6.6	3.9	2543	150.16	2721.6	49.0	<10%
07/08/2012	UM13B-1-S38	68	0.02	467504	54672	50931	363368	13771	0.3	106.0	120	361	0.1158	0.61	4.5774	1.63	0.2866	1.52	0.93	1892.6	11.0	1624.8	43.4	1745.2	26.9	14.2	6.9	1594	54.80	1745.2	26.9	>10%
07/08/2012	UM13B-1-S39	1818	0.11	263369	37592	62075	1183676	46948	0.3	59.7	391	1232	0.1379	4.46	0.8982	4.87	0.0472	1.95	0.40	2201.6	77.5	297.5	11.3	650.8	45.7	86.5	54.3	266	10.57	266	10.57	>10%
07/08/2012	UM13B-1-S40	-45	0.00	44823	2770	10310	257623	4449	0.7	10.2	85	117	0.0600	1.23	0.7095	2.13	0.0858	1.73	0.81	602.0	26.7	530.8	17.6	544.5	17.8	11.8	2.5	530	19.11	530	19.11	>10%
07/08/2012	UM13B-1-S41	-140	0.01	284518	19913	24601	381766	26219	0.2	64.5	126	688	0.0699	0.70	0.9110	2.29	0.0945	2.18	0.95	926.6	14.4	581.9	24.3	657.6	22.0	37.2	11.5	575	26.20	575	26.20	>10%
07/08/2012	UM13B-1-S43	-54	0.03	486114	47869	128666	1221940	22265	0.7	110.3	404	584	0.0964	0.73	2.4919	2.73	0.1874	2.63	0.96	1556.5	13.6	1107.2	53.2	1269.7	38.8	28.9	12.8	1080	61.55	1269.7	38.8	>10%
06/08/2012	UM13B-2-U52	128	0.00	25739	1290	4177	583102	15068	0.5	5.2	173	349	0.0492	1.51	0.0998	2.15	0.0147	1.53	0.71	158.8	35.3	94.1	2.9	96.6	4.0	40.7	2.6	94	2.90	94	2.90	<10%
06/08/2012	UM13B-2-U53	7	0.00	60333	2994	10028	1358933	35174	0.5	12.3	402	814	0.0490	1.08	0.0993	1.77	0.0147	1.40	0.79	147.1	25.4	94.0	2.6	96.1	3.2	36.1	2.1	94	2.64	94	2.64	<10%
06/08/2012	UM13B-2-U54	-120	0.02	29634	2271	10704	259121	3258	1.0	6.0	77	75	0.0762	1.25	0.8186	1.99	0.0779	1.55	0.78	1099.7	24.9	483.8	14.4	607.2	18.0	56.0	20.3	472	15.20	472	15.20	>10%
06/08/2012	UM13B-2-U56	-30	0.02	9912	636	2532	395364	5881	0.9	2.0	117	136	0.0636	2.09	0.1271	2.74	0.0145	1.77	0.65	729.6	44.3	92.7	3.3	121.4	6.3	87.3	23.7	91	3.25	91	3.25	>10%
06/08/2012	UM13B-2-U58	104	0.01	28614	1722	5055	764314	16424	0.6	5.8	226	380	0.0597	2.92	0.1249	3.41	0.0152	1.76	0.52	593.5	63.3	97.0	3.4	119.5	7.7	83.7	18.8	96	3.40	96	3.40	>10%
06/08/2012	UM13B-2-U60	-5	0.02	37220	2301	6102	705822	20830	0.4	7.6	209	482	0.0601	3.61	0.1274	3.94	0.0154	1.58	0.40	606.1	78.0	98.4	3.1	121.7	9.0	83.8	19.2	97	3.08	97	3.08	>10%
06/08/2012	UM13B-2-U61	61	0.01	385930	37884	23798	183092	13218	0.2	78.6	54	306	0.0975	0.79	3.4535	2.38	0.2569	2.25	0.94	1577.0	14.7	1473.8	59.0	1516.7	36.8	6.5	2.8	1465	73.58	1516.7	36.8	<10%
06/08/2012	UM13B-2-U64	25	0.00	7970	389	1387	182017	4765	0.5	1.6	54	110	0.0477	2.52	0.0947	3.09	0.0144	1.78	0.58	84.6	59.9	92.2	3.3	91.9	5.4	-9.0	-0.3	92	3.30	92	3.30	<10%
06/08/2012	UM13B-2-U65	56	0.00	42899	2048	928	521597	111675	0.1	8.7	154	2584	0.0473	1.33	0.0218	2.07	0.0033	1.59	0.77	66.8	31.6	21.5	0.7	21.9	0.9	67.8	1.9	22	0.68	22	0.68	<10%
06/08/2012	UM13B-2-U66	86	0.01	29233	1511	468	214436	71267	0.0	6.0	63	1649	0.0514	1.36	0.0276	8.42	0.0039	8.30	0.99	259.8	31.3	25.0	4.1	27.6	4.6	90.4	9.4	25	4.14	25	4.14	<10%
06/08/2012	UM13B-2-U67	53	0.05	783839	128722	60508	331244	17383	0.2	159.6	98	402	0.1618	0.68	8.6200	2.15	0.3864	2.03	0.95	2474.4	11.5	2106.2	72.7	2298.7	38.3	14.9	8.4	2024	96.47	2298.7	38.3	>10%
06/08/2012	UM13B-2-U68	21	0.00	27073	1368	4803	683252	15828	0.6	5.5	202	366	0.0508	1.35	0.1035	2.07	0.0148	1.57	0.76	230.8	31.2	94.6	3.0	100.0	3.9	59.0	5.4	94	2.99	94	2.99	<10%
06/08/2012	UM13B-2-U69	17	0.00	12784	654	3401	464112	7410	0.8	2.6	137	171	0.0517	1.78	0.1060	2.37	0.0149	1.57	0.66	273.1	40.8	95.1	3.0	102.3	4.6	65.2	7.0	95	2.99	95	2.99	<10%
06/08/2012	UM13B-2-U70-1	-50	0.00	141214	6729	29579	4264297	79107	0.7	28.8	1263	1830	0.0477	0.88	0.1009	1.70	0.0153	1.46	0.86	86.1	20.8	98.1	2.8	97.6	3.2	-14.0	-0.5	98	2.88	98	2.88	<10%
06/08/2012	UM13B-2-U70-2	-20	0.00	14205	737	4078	575810	8266	0.9	2.9	170	191	0.0512	1.74	0.1056	2.33	0.0150	1.55	0.66	249.9	40.1	95.7	2.9	102.0	4.5	61.7	6.1	95	2.98	95	2.98	<10%
06/08/2012	UM13B-2-U71	13	0.00	43645	2577	33	381	4334	0.0	8.9	0	100	0.0589	1.26	0.7032	2.01	0.0866	1.57	0.78	563.7	27.4	535.2	16.1	540.7	16.7	5.0	1.0	535	17.50	535	17.50	<10%
06/08/2012	UM13B-2-U73	-17	0.00	572180	98331	13075	59230	10441	0.1	116.5	18	242	0.1692	0.71	11.1610	1.81	0.4783	1.66	0.92	2550.0	11.9	2520.0	69.0	2536.7	33.2	1.2	0.7	2511	102.18	2536.7	33.2	<10%
06/08/2012	UM13B-2-U74	-49	0.00	64909	3509	13144	867774	16541	0.7	13.2	257	383	0.0538	1.34	0.2551	2.11	0.0344	1.63	0.77	362.4	30.2	218.0	7.0	230.7	8.7	39.9	5.5	217	7.22	217	7.22	<10%
06/08/2012	UM13B-2-U75	53	0.01	571565	47384	5731	52955	24586	0.0	116.4	16	569	0.0837	0.78	2.3176	1.68	0.2008	1.49	0.89	1286.3	15.1	1179.4	32.0	1217.7	23.5	8.3	3.1	1173	38.23	1217.7	23.5	<10%
06/08/2012	UM13B-2-U77	70	0.00	25202	1335	6779	947934	14627	0.8	5.1	281	338	0.0516	1.64	0.1066	2.19	0.0150	1.45	0.66	266.4	37.7	96.0	2.8	102.9	4.3	64.0	6.7	96	2.79	96	2.79	<10%
06/08/2012	UM13B-2-U78	5	0.00	273411	15405	77616	2279551	34093	0.9	55.7	675	789	0.0556	0.72	0.5370	1.62	0.0700	1.46	0.90	437.3	16.0	436.3	12.3	436.5	11.4	0.2	0.0	436	13.14	436	13.14	<10%
06/08/2012	UM13B-2-U79	28	0.00	23467	1159	5234	746312	13536	0.7	4.8	221	313	0.0484	1.28	0.1002	1.99	0.0150	1.53	0.77	116.7	30.2	96.2	2.9	97.0	3.7	17.6	0.8	96	2.96	96	2.96	<10%
06/08/2012	UM13B-2-U80	-103	0.00	253112	12430	2855	259133	99211	0.0	51.5	77	2296	0.0494	1.01	0.1512	1.99	0.0222	1.71	0.86	165.5	23.6	141.6	4.8	143.0	5.3	14.4	0.9	142	4.90	142	4.90	<10%
06/08/2012	UM13B-2-U81	-8	0.00	1041084	121141	23477	153836	27145	0.1	212.0	46	628	0.1152	0.62	5.2299	1.54	0.3292	1.41	0.92	1883.5	11.2	1834.4	45.0	1857.5	26.0	2.6	1.2	1828	59.71	1857.5	26.0	<10%
06/08/2012	UM13B-2-U83-1	-11	0.01	8564	457	2353	327842	4891	0.9	1.7	97	113	0.0529	2.89	0.1110	3.37	0.0152	1.73	0.51	325.1	65.6	97.3	3.3	106.9	6.8	70.1	8.9	97	3.38	97	3.38	<10%
06/08/2012	UM13B-2-U83-2	6	0.02	9092	566	2829	366274	5366	0.9	1.9	108	124	0.0604	3.21	0.1245	3.72	0.0149	1.87	0.50	617.8	69.4	95.6	3.6	119.1	8.3	84.5	19.7	94	3.55	94	3.55	>10%
06/08/2012	UM13B-2-U84	55	0.03	55958	3824	20200	465177	23095	0.3	11.4	138	534	0.0697	2.21	0.1945	3.87	0.0202	3.17	0.82	919.5	45.5	129.2	8.1	180.5	12.7	85.9	28.4	126	8.06	126	8.06	>10%
06/08/2012	UM13B-2-U85-1	89	0.00	5952	307	1379	213163	3370	0.8	1.2	63	78	0.0505	2.76	0.1050	3.34	0.0151	1.89	0.56	217.6	63.9	96.5	3.6	101.3	6.4	55.7	4.8	96	3.66	96	3.66	<10%
06/08/2012	UM13B-2-U85-2	45	0.01	6552	347	1229	176357	3788	0.6	1.3	52	88	0.0535	3.41	0.1126	3.94	0.0153	1.97	0.50	348.6	77.1	97.7	3.8	108.4	8.1	72.0	9.8	97	3.86	97	3.86	<10%
06/08/2012	UM13B-2-U86	-70	0.01	69805	4463	23399	512150	12175	0.5	14.2	152	282	0.0629	0.95	0.4308	1.74	0.0497	1.46	0.84	704.0	20.2	312.7	8.9	363.8	10.6	55.6	14.0	309	9.24	309	9.24	>10%
06/08/2012	UM13B-2-U87	-56	0.01	14466	790	3493	506995	8383	0.8	2.9	150	194	0.0546	2.59	0.1116	3.10	0.0148	1.69	0.55	396.1	58.2	94.8	3.2	107.4	6.3	76.1	11.7	94	3.20	94	3.20	>10%
06/08/2012	UM13B-2-U88	156	0.00	6774	344	1411	212243	3756	0.7	1.4	63	87	0.0503	3.29	0.1082	3.84	0.0156	1.98	0.52	206.7	76.3	99.9	3.9	104.3	7.6	51.7	4.2	100	3.98	100	3.98	<10%
06/08/2012	UM13B-2-U89	-15	0.00	10630	538	1797	629161	15152	0.5	2.2	186	351	0.0506	2.06	0.0425	2.58	0.0061	1.54	0.60	221.9	47.7	39.2	1.2	42.3	2.1	82.3	7.3	39	1.21	39	1.21	<10%
06/08/2012	UM13B-2-U90	-23	0.00	60845	2969	9473	1290715	34387	0.5	12.4	382	796	0.0482	1.03	0.1028	1.77	0.0155	1.44	0.81	106.7	24.3	99.0	2.8	99.3	3.3	7.2	0.3	99	2.87	99	2.87	<10%
06/08/2012	UM13B-2-U91	182	0.00	18145	905	5645	870500	10595	1.1	3.7	258	245	0.0507	1.66	0.1031	2.33	0.0148	1.63	0.70	226.6	38.4	94.4	3.0	99.6	4.4	58.3	5.2	94	3.08	94	3.08	<10%
06/08/2012	UM13B-2-U93	-71	0.00	13613	701	2752	421757	7847	0.7	2.8	125	182	0.0504	2.07	0.1061	2.65	0.0153	1.65	0.62	211.7	48.1	97.8	3.2	102.4	5.1	53.8	4.5	98	3.24	98	3.24	<10%
06/08/2012	UM13B-2-U94	27	0.03	18641	1369	6472	829984	10395	1.0	3.8	246	241	0.0719	2.83	0.1527	3.24	0.0154	1.57	0.49	983.2	57.6	98.5	3.1	144.3	8.7	90.0	31.7	96	3.03	96	3.03	>10%
06/08/2012	UM13B-2-U97	58	0.00	26796	1360	4619	678703	15231	0.6	5.5	201	352	0.0507	1.52	0.1071	2.15	0.0153	1.52	0.71	228.2	35.1	98.0	2.9	103.3	4.2	57.1	5.2	98	2.99	98	2.99	<10%
06/08/2012	UM13B-2-U98	-20	0.01	12317	667	3347	485316	7158	0.9	2.5	144	166	0.0529	2.18	0.1100	2.71	0.0151	1.62	0.60	323.7	49.5	96.6	3.1	106.0	5.4	70.2	8.9	96	3.13	96	3.13	<10%
06/08/2012	UM13B-2-U99	53	0.08	4293	502	1565	109456	2233	0.6	0.9	32	52	0.1143	4.19	0.2637	4.70	0.0167	2.14	0.46	1868.9	75.5	107.0	4.5	237.7	19.7	94.3	55.0	98	4.24	98	4.24	>10%
	UM14B Zircon																															
07/08/2012	UM14B-U100	-19	0.02	5050	338	2855	1491565	11567	1.6	1.1	493	303	0.0652	3.32	0.0335	3.77	0.0037	1.80	0.48	781.1	69.7	24.0	0.9	33.5	2.5	96.9	28.3	23	0.84	23	0.84	>10%
07/08/2012	UM14B-U101	49	0.00	346424	31596	81290	687017	11469	0.8	78.6	227	301	0.0910	0.80	3.2227	1.77	0.2569	1.58	0.89	1446.3	15.2	1473.9	41.4	1462.6	27.0	-1.9	-0.8	1477	52.24	1462.6	27.0	<10%
07/08/2012	UM14B-U103	-16	0.00	17989	876	2550	998896	26207	0.5	4.1	330	688	0.0485	1.74	0.0387	2.37	0.0058	1.61	0.68	124.8	41.1	37.1	1.2	38.5	1.8	70.2	3.6	37	1.20	37	1.20	<10%
07/08/2012	UM14B-U104	78	0.00	14078	691	1690	608583	20925	0.4	3.2	201	549	0.0499	1.78	0.0398	2.49	0.0058	1.74	0.70	188.8	41.4	37.2	1.3	39.6	1.9	80.3	6.1	37	1.30	37	1.30	<10%

07/08/2012	UM14B-U106	9	0.01	30102	1683	18729	9253961	65489	1.8	6.8	3056	1718	0.0566	1.65	0.0308	2.23	0.0039	1.50	0.67	475.9	36.5	25.4	0.8	30.8	1.4	94.7	17.6	25	0.75	25	0.75	>10%
07/08/2012	UM14B-U107	-24	0.01	20597	1147	8675	4548479	44622	1.3	4.7	1502	1171	0.0554	1.86	0.0296	2.41	0.0039	1.53	0.64	427.0	41.5	24.9	0.8	29.6	1.4	94.2	15.8	25	0.76	25	0.76	>10%
07/08/2012	UM14B-U108	0	0.02	14975	897	4975	2555401	32681	1.0	3.4	844	857	0.0590	1.75	0.0319	2.38	0.0039	1.61	0.68	566.3	38.2	25.2	0.8	31.8	1.5	95.6	20.8	25	0.80	25	0.80	>10%
07/08/2012	UM14B-U109-1	256	0.02	14182	838	1252	359608	21114	0.2	3.2	119	554	0.0594	4.45	0.0465	4.94	0.0057	2.15	0.44	580.8	96.7	36.5	1.6	46.1	4.5	93.7	20.9	36	1.55	36	1.55	>10%
07/08/2012	UM14B-U109-2	20	0.16	166565	30749	13500	203443	13957	0.2	37.8	67	366	0.1812	1.35	2.5879	3.59	0.1036	3.33	0.93	2664.1	22.3	635.3	40.1	1297.2	51.3	76.2	51.0	541	37.47	541	37.47	>10%
07/08/2012	UM14B-U112	111	0.01	15937	791	7483	3952856	34528	1.4	3.6	1305	906	0.0507	1.77	0.0273	2.34	0.0039	1.53	0.65	229.3	40.9	25.1	0.8	27.4	1.3	89.0	8.2	25	0.77	25	0.77	<10%
07/08/2012	UM14B-U113	30	0.01	16046	870	8260	4311379	34009	1.6	3.6	1424	892	0.0571	1.94	0.0305	2.52	0.0039	1.61	0.64	496.7	42.7	24.9	0.8	30.5	1.5	95.0	18.3	25	0.79	25	0.79	>10%
07/08/2012	UM14B-U114	-78	0.01	12090	621	3291	1764868	26254	0.8	2.7	583	689	0.0513	2.28	0.0272	2.81	0.0039	1.65	0.59	253.9	52.4	24.8	0.8	27.3	1.5	90.2	9.2	25	0.81	25	0.81	<10%
07/08/2012	UM14B-U115	-6	0.00	19375	1044	3010	122561	3269	0.5	4.4	40	86	0.0546	1.60	0.3820	2.36	0.0507	1.74	0.74	396.0	35.9	319.1	10.8	328.5	13.2	19.4	2.9	318	11.34	318	11.34	<10%
07/08/2012	UM14B-U117-1	-259	0.02	11182	667	1791	538357	16549	0.4	2.5	178	434	0.0617	5.03	0.0483	5.69	0.0057	2.66	0.47	662.2	107.8	36.6	1.9	47.9	5.3	94.5	23.7	36	1.92	36	1.92	>10%
07/08/2012	UM14B-U117-2	109	0.02	26529	1680	1868	298793	10182	0.4	6.0	99	267	0.0626	1.94	0.2125	7.20	0.0246	6.93	0.96	695.7	41.3	156.7	21.4	195.6	25.3	77.5	19.9	154	21.57	154	21.57	>10%
07/08/2012	UM14B-U118	59	0.01	15123	790	5579	2794934	33712	1.0	3.4	923	885	0.0527	2.15	0.0273	2.67	0.0038	1.59	0.59	317.7	48.9	24.2	0.8	27.4	1.4	92.4	11.7	24	0.76	24	0.76	>10%
07/08/2012	UM14B-U120	49	0.03	49461	3222	21689	11061850	104733	1.3	11.2	3653	2748	0.0665	2.20	0.0363	2.68	0.0040	1.54	0.57	821.4	45.9	25.5	0.8	36.2	1.9	96.9	29.6	25	0.77	25	0.77	>10%
07/08/2012	UM14B-U121	-97	0.01	5039	274	3133	1635310	11279	1.8	1.1	540	296	0.0515	3.06	0.0272	3.57	0.0038	1.85	0.52	262.8	70.2	24.7	0.9	27.3	1.9	90.6	9.5	25	0.91	25	0.91	<10%
07/08/2012	UM14B-U123	47	0.01	8474	474	5219	2541653	18880	1.7	1.9	839	495	0.0574	3.00	0.0301	3.53	0.0038	1.87	0.53	505.0	66.0	24.5	0.9	30.2	2.1	95.1	18.7	24	0.91	24	0.91	>10%
07/08/2012	UM14B-U124	52	0.01	16790	893	8880	3939294	36525	1.4	3.8	1301	958	0.0533	1.89	0.0283	2.41	0.0039	1.51	0.62	340.0	42.7	24.8	0.7	28.3	1.3	92.7	12.5	25	0.74	25	0.74	>10%
07/08/2012	UM14B-U125	-69	0.01	16927	844	6537	3236634	36555	1.1	3.8	1069	959	0.0509	1.91	0.0274	2.50	0.0039	1.60	0.64	235.9	44.2	25.2	0.8	27.5	1.4	89.3	8.5	25	0.80	25	0.80	<10%
07/08/2012	UM14B-U127	115	0.02	14097	854	6267	3039073	31470	1.2	3.2	1004	826	0.0589	2.08	0.0311	2.61	0.0038	1.58	0.61	565.2	45.2	24.6	0.8	31.1	1.6	95.6	20.8	24	0.77	24	0.77	>10%
07/08/2012	UM14B-U130	-46	0.01	11654	589	2834	961025	16860	0.7	2.6	317	442	0.0508	2.04	0.0406	2.62	0.0058	1.65	0.63	229.6	47.2	37.3	1.2	40.4	2.1	83.8	7.7	37	1.23	37	1.23	<10%
07/08/2012	UM14B-U131	22	0.02	17684	1175	6443	2939998	40213	0.9	4.0	971	1055	0.0654	2.32	0.0336	2.85	0.0037	1.66	0.58	786.8	48.7	24.0	0.8	33.6	1.9	97.0	28.5	23	0.78	23	0.78	>10%
07/08/2012	UM14B-U133	-13	0.01	35250	1994	23569	12316230	76919	2.0	8.0	4068	2018	0.0559	1.69	0.0298	2.28	0.0039	1.53	0.67	450.1	37.6	24.9	0.8	29.8	1.3	94.5	16.6	25	0.76	25	0.76	>10%
07/08/2012	UM14B-U134	16	0.00	149830	8311	16503	474982	17104	0.3	34.0	157	449	0.0547	0.79	0.5684	1.73	0.0754	1.54	0.89	400.4	17.6	468.3	13.9	457.0	12.7	-16.9	-2.5	469	15.01	469	15.01	<10%
07/08/2012	UM14B-U135	-94	0.00	211003	16757	50106	532785	9544	0.7	47.9	176	250	0.0792	0.84	2.0332	1.82	0.1862	1.61	0.89	1176.6	16.6	1101.0	32.6	1126.7	24.4	6.4	2.3	1097	38.51	1126.7	24.4	<10%
07/08/2012	UM14B-U139	133	0.00	10894	521	1418	486624	16645	0.4	2.5	161	437	0.0474	3.08	0.0353	3.58	0.0054	1.83	0.51	69.3	73.4	34.7	1.3	35.2	2.5	49.9	1.4	35	1.27	35	1.27	<10%
07/08/2012	UM14B-U142	-84	0.02	22560	1477	12316	6063429	50137	1.5	5.1	2003	1315	0.0641	2.24	0.0333	2.70	0.0038	1.52	0.56	744.5	47.3	24.3	0.7	33.3	1.8	96.7	27.1	24	0.72	24	0.72	>10%
07/08/2012	UM14B-U143	-12	0.01	15975	888	3414	1149539	22798	0.6	3.6	380	598	0.0563	2.40	0.0465	2.97	0.0060	1.74	0.59	465.5	53.2	38.5	1.3	46.1	2.7	91.7	16.6	38	1.33	38	1.33	>10%
07/08/2012	UM14B-U147	13	0.02	9307	579	5482	2904422	19589	1.9	2.1	959	514	0.0622	3.59	0.0338	4.01	0.0039	1.79	0.45	682.5	76.7	25.3	0.9	33.7	2.7	96.3	24.9	25	0.89	25	0.89	>10%
	X002 Zircon																														
26/06/2012	X002-I02-1	36	0.07	251130	50290	24550	166881	4873	0.4	124.44	113	267	0.2032	0.71	12.9564	2.77	0.4623	2.68	0.97	2852.4	11.5	2449.9	108.4	2676.5	51.0	14.1	8.5	2309	147.92	2676.5	51.0	<10%
26/06/2012	X002-I02-2	-42	0.08	287961	56580	6177	54786	6433	0.1	142.69	37	353	0.1976	0.72	11.3742	2.98	0.4175	2.89	0.97	2806.5	11.7	2248.9	108.9	2554.3	54.2	19.9	12.0	2088	141.52	2554.3	54.2	>10%
26/06/2012	X002-Q27-1	-16	0.02	129992	9047	18924	485056	13369	0.4	64.41	329	734	0.0710	0.98	0.8414	2.59	0.0859	2.40	0.93	958.7	20.0	531.2	24.4	619.9	23.8	44.6	14.3	523	26.09	523	26.09	>10%
26/06/2012	X002-Q27-2	-74	0.00	107701	6145	8971	298179	11965	0.3	53.37	202	656	0.0572	0.95	0.6333	2.56	0.0802	2.37	0.93	500.9	21.0	497.5	22.7	498.1	19.9	0.7	0.1	498	24.52	498	24.52	<10%
26/06/2012	X002-Q28	42	0.00	50036	2530	4555	763090	27290	0.3	24.79	517	1497	0.0502	1.29	0.1146	2.66	0.0166	2.32	0.87	203.7	29.9	105.9	4.9	110.1	5.5	48.0	3.9	106	4.95	106	4.95	<10%
08/08/2012	X002-RZ1	5	0.02	105984	9774	5564	4352	5964	0.0	11.0	1	70	0.0839	0.93	1.8073	1.80	0.1563	1.54	0.86	1289.8	18.1	936.0	26.7	1048.1	23.2	27.4	10.7	921	30.38	1048.1	23.2	>10%
08/08/2012	X002-RZ2	726	0.05	1352023	197291	176401	3198614	42481	1.0	140.1	480	496	0.1335	0.55	5.0467	1.33	0.2742	1.21	0.91	2144.0	9.7	1562.3	33.4	1827.2	22.2	27.1	14.5	1492	40.74	1827.2	22.2	>10%
08/08/2012	X002-RZ3	516	0.04	1989670	348152	158951	2299910	40858	0.7	206.2	345	477	0.1658	0.78	9.5742	1.65	0.4189	1.46	0.88	2515.5	13.2	2255.3	55.2	2394.7	30.0	10.3	5.8	2188	76.15	2394.7	30.0	<10%
07/08/2012	X002-S01	27	0.05	1795	143	1162	165737	988	2.1	0.4	52	24	0.0841	5.33	0.1823	6.00	0.0157	2.75	0.46	1295.2	103.7	100.5	5.5	170.0	18.6	92.2	40.9	96	5.31	96	5.31	>10%
07/08/2012	X002-S02	-64	0.00	208260	16119	18911	238474	9845	0.3	45.3	75	242	0.0765	0.71	1.9416	1.69	0.1842	1.54	0.91	1107.1	14.1	1089.8	30.7	1095.6	22.4	1.6	0.5	1089	36.41	1095.6	22.4	<10%
07/08/2012	X002-S02-3	801	0.04	566531	52955	49893	2459513	49510	0.6	123.2	769	1216	0.0925	1.08	1.2684	2.01	0.0995	1.70	0.84	1476.9	20.4	611.5	19.8	831.7	22.6	58.6	26.5	587	20.85	587	20.85	>10%
07/08/2012	X002-S03	244	0.08	661575	122342	31999	471400	15888	0.4	143.9	147	390	0.1853	0.99	9.9865	2.93	0.3909	2.76	0.94	2700.8	16.3	2127.0	99.3	2433.5	52.7	21.2	12.6	1984	127.40	2433.5	52.7	>10%
07/08/2012	X002-S04	653	0.05	1378805	172411	49880	332428	52070	0.1	299.8	104	1279	0.1256	0.73	3.9555	1.66	0.2284	1.49	0.90	2037.1	13.0	1326.3	35.6	1625.1	26.6	34.9	18.4	1261	41.56	1625.1	26.6	>10%
07/08/2012	X002-S05	220	0.14	15282	2342	6297	643429	11451	0.7	3.5	212	300	0.1562	2.24	0.2491	2.82	0.0116	1.72	0.61	2414.9	38.0	74.1	2.5	225.8	11.4	96.9	67.2	64	2.22	64	2.22	>10%
07/08/2012	X002-S06	11	0.00	146954	11439	16848	217184	6750	0.4	32.0	68	166	0.0779	0.74	2.0053	1.68	0.1866	1.51	0.90	1145.1	14.7	1103.1	30.6	1117.3	22.6	3.7	1.3	1101	36.28	1117.3	22.6	<10%
07/08/2012	X002-S07	59	0.00	74443	4889	5761	97952	4783	0.3	16.9	32	125	0.0652	0.95	1.2087	1.93	0.1344	1.68	0.87	781.5	19.9	813.0	25.6	804.6	21.2	-4.0	-1.0	814	29.11	804.6	21.2	<10%
07/08/2012	X002-S08	1137	0.05	1272461	266961	243045	1009401	22466	0.6	288.6	333	589	0.2063	0.58	14.2472	1.75	0.5010	1.65	0.94	2876.4	9.5	2617.9	70.8	2766.3	32.8	9.0	5.4	2512	102.47	2766.3	32.8	<10%
07/08/2012	X002-S09	469	0.06	1229226	184839	130799	837181	34159	0.3	278.8	276	896	0.1516	1.23	6.7051	2.53	0.3207	2.21	0.87	2364.4	21.0	1793.2	68.9	2073.3	43.8	24.2	13.5	1700	85.69	2073.3	43.8	>10%
07/08/2012	X002-S11	4320	0.14	1275837	274915	294080	1445798	31154	0.6	289.4	477	817	0.2159	1.38	10.5939	2.55	0.3559	2.15	0.84	2950.1	22.3	1962.9	72.4	2488.2	46.3	33.5	21.1	1726	85.10	2488.2	46.3	>10%
07/08/2012	X002-S12	243	0.06	286287	48271	47033	191519	7058	0.3	64.9	63	185	0.1681	0.83	8.7056	3.48	0.3756	3.38	0.97	2538.7	14.0	2055.8	118.0	2307.7	61.5	19.0	10.9	1950	152.39	2307.7	61.5	>10%
07/08/2012	X002-S13-1	1280	0.09	1254433	189394	367706	3638324	52060	0.9	284.6	1202	1366	0.1507	0.62	4.3155	1.62	0.2077	1.50	0.92	2353.7	10.6	1216.6	33.1	1696.3	26.4	48.3	28.3	1112	36.49	1696.3	26.4	>10%
07/08/2012	X002-S13-2	478	0.08	738996	123136	188150	2683477	19791	1.7	167.6	886	519	0.1665	0.65	7.5593	2.35	0.3292	2.26	0.96	2523.0	10.9	1834.6	71.8	2180.0	41.3	27.3	15.8	1711	88.27	2180.0	41.3	>10%
07/08/2012	X002-S14	158	0.06	519085	107826	67932	357353	9103	0.5	117.7	118	239	0.2082	0.66	14.0422	1.68	0.4892	1.54	0.92	2891.5	10.7	2567.1	64.9	2752.6	31.3	11.2	6.7	2440	92.19	2752.6	31.3	<10%
07/08/2012	X002-S15	122	0.10	2928	380	2878	340428	1495	2.9	0.7	112	39	0.1308	3.83	0.3096	4.64	0.0172	2.62	0.56	2109.2	67.2	109.7	5.7	273.9	22.0	94.8	59.9	98	5.19	98	5.19	>10%
	X008 Zircon																														
06/08/2012	X008-2-T08	12	0.00	9466	451	2744	1613587	22176	0.9	1.9	478	513	0.0465	2.21	0.0235	2.75	0.0037	1.62	0.59	26.1	53.1	23.6	0.8	23.6	1.3	9.4	0.1	24	0.77	24	0.77	<10%
06/08/2012	X008-2-T09	113	0.00	3101	156	531	288600	7093	0.5	0.6	85	164	0.0503	3.93	0.0263	4.39	0.0038	1.97	0.45	210.7	91.0	24.4	1.0	26.3	2.3	88.4	7.5	24	0.96	24	0.96	<10%
06/08/2012	X008-2-T10	148	0.04	36527	2916	30004	17831290	80204	2.8	7.4	5280	1856	0.0791	1.54	0.0431	2.09	0.0040	1.40	0.67	1173.9	30.6	25.4	0.7	42.8	1.7	97.8	40.6	24	0.69	24	0.69	>10%
06/08/2012	X008-2-T11	-105	0.00	10689	510	2605	1584743	25002	0.8	2.2	469	578	0.0478	1.99	0.0240	2.56	0.0036	1.60	0.63	89.0	47.2	23.4	0.8	24.1	1.2	73.7	2.7	23	0.75	23	0.75	<10%
06/08/2012	X008-2-T12	-17	0.00	3478	175	1325	788510	7955	1.3	0.7	233	184	0.0488	3.34	0.0255	3.79	0.0038	1.81	0.48	138.6	78.3	24.4	0.9	25.6	1.9	82.4	4.6	24	0.88	24	0.88	<10%
06/08/2012	X008-2-T13	437	0.37	13986	4847	12994	2185125	19572	1.4	2.8	647	453	0.3365	6.46	0.3088	8.79	0.0067	5.97	0.68	3647.1	98.8	42.8	5.1	273.2	41.3	98.8	84.4	27	3.25	27	3.25	>10%
06/08/2012	X008-2-T14	176	0.04	4094	320	1195	507613	9180	0.7	0.8	150	212	0.0801	3.45	0.0423	3.95	0.0038	1.92	0.49	1200.5	68.1	24.6	0.9	42.1	3.3	97.9	41.5	24	0.91	24	0.91	>10%
06/08/2012	X008-2-T15	13	0.03	4306	313	1251	574681	9768	0.8	0.9	170	226	0.0725	3.06	0.0385	3.53	0.0038	1.74	0.49	1000.6	62.2	24.8	0.9	38.3	2.6	97.5	35.4	24	0.84	24	0.84	>10%
06/08/2012	X008-2-T16	-16	0.01	19190	1036	4732	2620218	41138	0.8	3.9	776	952	0.0544	1.75	0.0296	2.35	0.0039	1.57	0.67	389.3	39.4	25.4	0.8	29.7	1.4	93.5	14.3	25	0.79	25	0.79	>10%
06/08/2012	X008-2-T17	21	0.01	51397	2746	34142	19462140	114479	2.2	10.5	5763	2649	0.0539	1.79	0.0285	2.28	0.0038	1.40	0.62	367.2	40.4	24.6	0.7	28.5	1.3	93.3	13.5	24	0.69	24	0.69	>10%
06/08/2012	X008-2-T18	-25	0.00	4922	253	935	552641	11553	0.6	1.0	164	267	0.0500	3.14	0.0253	3.60	0.0037	1.76	0.49	194.1	72.9	23.7	0.8	25.4	1.8	87.8	6.9	24	0.83	24	0.83	<10%
06/08/2012	X008-2-T19	-35	0.02	19350	1161	15759	8432399	43835	2.5	3.9	2497	1014	0.0600	2.50	0.0306	2.96	0.0037	1.59	0.54	603.6	54.1	23.8	0.8	30.6	1.8	96.1	22.2	23	0.74	23	0.74	>10%
06/08/2012	X008-2-T20	23	0.00	35662	1746	21316	12743670	81700	2.0	7.3	3773	1890	0.0485	1.51	0.0250	2.12	0.0037	1.49	0.70	123.6	35.6	24.1	0.7	25.1	1.1	80.5	4.0	24	0.72	24	0.72	<10%
06/08/2012	X008-2-T21	-66	0.00	18188	897	7093	4103627	42081	1.2	3.7	1215	974	0.0489	1.67	0.0249	2.23	0.0037	1.49	0.67	142.3	39.2	23.8	0.7	25.0	1.1	83.3	4.8	24	0.71	24	0.71	<10%
06/08/2012	X008-2-T22	36	0.02	37062	2239	21533	10983330	83590	1.7	7.5	3252	1934	0.0596	1.69	0.0315	2.25	0.0038	1.48	0.66	588.7	36.7	24.7	0.7	31.5	1.4	95.8	21.7	24	0.72	24	0.72	>10%
06/08/2012	X008-2-T23	-2	0.01	5099	281	1482	783124	11467	0.9	1.0	232	265	0.0550	3.17	0.0286	3.65	0.0038	1.81	0.50	413.5	70.9	24.3	0.9	28.7	2.1	94.1	15.3	24	0.87	24	0.87	>10%
06/08/2012	X008-2-T24	-47	0.00	23863	1163	8003	4319383	56127	1.0	4.9	1279	1299	0.0473	1.60	0.0241	2.21	0.0037	1.52	0.69	64.1	38.2	23.8	0.7	24.2	1.1	62.9	1.7	24	0.72	24	0.72	<10%
06/08/2012	X008-2-T25	-58	0.03	3353	228	1287	575144	7573	1.0	0.7	170	175	0.0698	3.80	0.0357	4.36	0.0037	2.13	0.49	922.8	78.1	23.8	1.0	35.6	3.0	97.4	33.0	23	0.99	23	0.99	>10%
06/08/2012	X008-2-T26	6	0.08	9641	1050	3412	944672	19949	0.6	2.0	280	462	0.1060	3.26	0.0615	3.81	0.0042	1.97	0.52	1731.3	59.7	27.1	1.1	60.6	4.5	98.4	55.3	25	0.99	25	0.99	>10%
06/08/2012	X008-2-T27	139	0.09	28520	3327	7654	1491903	60369	0.3	5.8	442	1397	0.1141	6.00	0.0642	6.32	0.0041	1.96	0.31	1865.6	108.3	26.3	1.0	63.2	7.7	98.6	58.4	24	0.95	24	0.95	>10%
06/08/2012	X008-2-U15	126	0.04	13328	965	9865	4997802	31379	2.0	2.7	1480	726	0.0759	2.43	0.0395	2.95	0.0038	1.67	0.57	1092.0	48.6	24.3	0.8	39.3	2.3	97.8	38.2	23	0.78	23	0.78	>10%
06/08/2012	X008-2-U16	-14	0.00	5019	257	1468	881421	11564	1.0	1.0	261	268	0.0497	2.75	0.0260	3.24	0.0038	1.72	0.53	180.8	64.1	24.4	0.8	26.0	1.7	86.5	6.3	24	0.84	24	0.84	<10%
06/08/2012	X008-2-U17	-39	0.02	1802	111	384	211231	4144	0.7	0.4	63	96	0.0636	5.80	0.0332	6.27	0.0038	2.38	0.38	726.9	123.0	24.4	1.2	33.2	4.1	96.6	26.5	24	1.14	24	1.14	>10%

06/08/2012	X008-2-U18	16	0.03	11497	825	4350	2256810	26007	1.1	2.3	668	602	0.0698	4.63	0.0365	4.92	0.0038	1.67	0.34	922.2	95.1	24.4	0.8	36.4	3.5	97.4	33.0	24	0.79	24	0.79	>10%
06/08/2012	X008-2-U19	75	0.06	6634	611	4968	2345350	14582	2.1	1.4	694	337	0.0908	4.72	0.0504	5.07	0.0040	1.85	0.37	1442.5	90.0	25.9	1.0	50.0	4.9	98.2	48.1	25	0.91	25	0.91	>10%
06/08/2012	X008-2-U20	46	0.02	1773	110	356	207912	4152	0.6	0.4	62	96	0.0641	5.99	0.0323	6.35	0.0036	2.11	0.33	746.2	126.7	23.5	1.0	32.3	4.0	96.9	27.2	23	0.97	23	0.97	>10%
06/08/2012	X008-2-U21	83	0.01	7817	396	2835	1694019	17755	1.2	1.6	502	411	0.0509	2.53	0.0266	3.03	0.0038	1.66	0.55	238.3	58.4	24.4	0.8	26.7	1.6	89.8	8.6	24	0.81	24	0.81	<10%
06/08/2012	X008-2-U22	47	0.02	20928	1234	10961	5484136	46187	1.5	4.3	1624	1069	0.0601	2.63	0.0324	3.03	0.0039	1.51	0.50	606.9	56.8	25.2	0.8	32.4	1.9	95.8	22.3	25	0.75	25	0.75	>10%
06/08/2012	X008-2-U23-1	99	0.00	4160	213	973	549350	9858	0.7	0.8	163	228	0.0487	3.90	0.0245	4.35	0.0037	1.92	0.44	133.1	91.7	23.5	0.9	24.6	2.1	82.3	4.5	24	0.90	24	0.90	<10%
06/08/2012	X008-2-U23-2	-62	0.05	3941	316	1243	552339	8492	0.8	0.8	164	196	0.0857	5.56	0.0470	5.94	0.0040	2.07	0.35	1331.5	107.7	25.6	1.1	46.6	5.4	98.1	45.1	24	1.01	24	1.01	>10%
06/08/2012	X008-2-U25	-78	0.03	11393	813	5734	2401741	24655	1.2	2.3	711	570	0.0714	3.62	0.0397	4.01	0.0040	1.73	0.43	969.3	73.8	25.9	0.9	39.5	3.1	97.3	34.4	25	0.87	25	0.87	>10%
06/08/2012	X008-2-U26	93	0.00	41950	2099	20720	11806970	98458	1.5	8.5	3496	2278	0.0485	1.16	0.0251	1.89	0.0038	1.49	0.79	125.5	27.4	24.1	0.7	25.2	0.9	80.8	4.1	24	0.72	24	0.72	<10%
06/08/2012	X008-2-U28	43	0.00	8640	432	2715	1502843	19867	1.0	1.8	445	460	0.0502	2.44	0.0264	2.89	0.0038	1.56	0.54	205.5	56.5	24.5	0.8	26.4	1.5	88.1	7.3	24	0.76	24	0.76	<10%
06/08/2012	X008-2-U29-1	82	0.01	19368	1109	4554	1450883	29200	0.6	3.9	430	676	0.0575	2.17	0.0456	2.69	0.0058	1.60	0.59	511.7	47.6	37.0	1.2	45.3	2.4	92.8	18.4	37	1.17	37	1.17	>10%
07/08/2012	X008-2-U29-2	257	0.05	30664	2791	11669	3396399	44357	1.0	6.7	1061	1089	0.0857	7.11	0.0705	7.35	0.0060	1.89	0.26	1332.3	137.5	38.3	1.4	69.2	9.8	97.1	44.6	37	1.38	37	1.38	>10%
07/08/2012	X008-2-U29-3	164	0.07	26602	2678	11324	3090141	37357	1.1	5.8	966	917	0.1015	2.24	0.0867	2.72	0.0062	1.54	0.57	1652.1	41.5	39.8	1.2	84.5	4.4	97.6	52.9	37	1.15	37	1.15	>10%
06/08/2012	X008-2-U30	78	0.04	6248	486	3027	1247850	14432	1.1	1.3	369	334	0.0774	3.32	0.0406	3.80	0.0038	1.84	0.48	1132.0	66.2	24.5	0.9	40.4	3.0	97.8	39.4	24	0.87	24	0.87	>10%
07/08/2012	X008-2-U37-1	52	0.02	13983	794	4804	2475969	32113	1.0	3.0	774	789	0.0615	3.60	0.0318	4.09	0.0038	1.94	0.48	656.8	77.2	24.2	0.9	31.8	2.6	96.3	24.1	24	0.92	24	0.92	>10%
07/08/2012	X008-2-U37-2	-19	0.00	9557	459	2823	1604106	22023	0.9	2.1	501	541	0.0474	2.05	0.0246	2.61	0.0038	1.61	0.62	70.5	48.8	24.2	0.8	24.7	1.3	65.7	1.9	24	0.78	24	0.78	<10%
06/08/2012	X008-2-U47	14	0.03	4537	310	1323	693980	10244	0.9	0.9	205	237	0.0677	2.86	0.0355	3.41	0.0038	1.87	0.55	860.6	59.3	24.4	0.9	35.4	2.4	97.2	31.0	24	0.89	24	0.89	>10%
06/08/2012	X008-2-U48	22	0.01	2700	139	541	273369	6123	0.6	0.5	81	142	0.0527	4.55	0.0280	5.02	0.0039	2.11	0.42	314.5	103.6	24.8	1.0	28.0	2.8	92.1	11.5	25	1.04	25	1.04	>10%
06/08/2012	X008-2-U50	-37	0.00	2684	131	965	563682	6271	1.2	0.5	167	145	0.0502	5.30	0.0263	5.77	0.0038	2.28	0.40	203.4	123.1	24.5	1.1	26.4	3.0	88.0	7.2	24	1.11	24	1.11	<10%
	UM13B Rutile																															
08/08/2012	UM13B1-rutile1	-21		2414	1692	3951	1404	1128	0.0	0.3	0	13	0.6742	2.91	1.4509	4.63	0.0156	3.60	0.778	4676.6	42.0	99.8	7.1	910.3	54.2	2.1	89.0	n/a	n/a			
08/08/2012	UM13B1-rutile2	13032		244362	206868	508279	1372922	2711	6.5	25.3	206	32	0.8198	1.09	72.4307	2.99	0.6408	2.79	0.931	4956.6	15.5	3192.0	138.9	4362.4	58.3	64.4	26.8	n/a	n/a			
08/08/2012	UM13B1-rutile3	7465		139973	117988	285381	484886	2846	2.2	14.5	73	33	0.8061	1.01	39.3174	2.25	0.3538	2.01	0.894	4932.5	14.4	1952.5	67.4	3753.7	43.6	39.6	48.0	n/a	n/a			
08/08/2012	UM13B1-rutile4	4452		84166	71408	175667	256358	4779	0.7	8.7	38	56	0.8370	1.51	14.7758	3.14	0.1280	2.75	0.877	4986.1	21.4	776.6	40.1	2800.9	58.0	15.6	72.3	n/a	n/a			
08/08/2012	UM13B1-rutile5	11209		205069	177772	438867	398305	1942	2.6	21.3	60	23	0.8346	1.04	88.6074	2.96	0.7700	2.77	0.936	4982.0	14.8	3680.6	153.5	4564.6	57.8	73.9	19.4	n/a	n/a			
08/08/2012	UM13B1-rutile6	6891		139634	114469	278838	344235	967	4.6	14.5	52	11	0.8325	1.01	117.4931	2.40	1.0236	2.18	0.908	4978.3	14.3	4544.1	140.5	4848.3	47.2	91.3	6.3	n/a	n/a			
08/08/2012	UM13B1-rutile7	8247		154283	130852	319432	315585	1831	2.2	16.0	47	21	0.8294	0.77	67.9413	2.07	0.5941	1.92	0.928	4973.0	11.0	3006.2	91.7	4298.4	40.6	60.5	30.1	n/a	n/a			
08/08/2012	UM13B1-rutile8	3455		61729	51847	123969	455167	3811	1.5	6.4	68	45	0.8165	1.01	12.9794	4.11	0.1153	3.98	0.969	4950.8	14.3	703.4	52.8	2678.2	74.6	14.2	73.7	n/a	n/a			
08/08/2012	UM13B1-rutile9	2413		47238	37132	95532	58366	4592	0.2	4.9	9	54	0.7748	0.78	7.9135	5.86	0.0741	5.80	0.991	4876.1	11.2	460.7	51.4	2221.2	100.5	9.4	79.3	n/a	n/a			
08/08/2012	UM13B1-rutile10	3346		64342	52094	133427	1205981	3272	4.7	6.7	181	38	0.8080	0.91	15.4816	3.06	0.1390	2.92	0.954	4936.0	13.0	838.8	45.8	2845.4	56.8	17.0	70.5	n/a	n/a			
08/08/2012	UM13B1-rutile11	6298		121892	100471	256130	433013	6391	0.9	12.6	65	75	0.8069	1.12	15.0552	2.81	0.1353	2.57	0.916	4934.0	16.0	818.1	39.4	2818.7	52.1	16.6	71.0	n/a	n/a			
08/08/2012	UM13B1-rutile12	1738		35843	28841	70616	37338	5036	0.1	3.7	6	59	0.7900	1.25	5.7607	3.12	0.0529	2.86	0.916	4903.8	17.8	332.2	18.5	1940.5	52.7	6.8	82.9	n/a	n/a			
08/08/2012	UM13B1-rutile13	2477		45693	38067	95852	113458	967	1.5	4.7	17	11	0.8235	1.47	36.9835	3.41	0.3257	3.08	0.903	4963.0	20.8	1817.5	96.9	3693.1	65.3	36.6	50.8	n/a	n/a			
08/08/2012	UM13B1-rutile14	4265		85175	70792	175781	496869	4642	1.4	8.8	74	54	0.8182	1.02	14.5590	2.26	0.1291	2.02	0.892	4953.7	14.5	782.5	29.7	2786.9	42.1	15.8	71.9	n/a	n/a			
08/08/2012	UM13B1-rutile15	2971		55141	45100	108610	157179	3735	0.5	5.7	24	44	0.7916	1.72	11.5049	2.81	0.1054	2.22	0.791	4906.7	24.5	646.0	27.3	2565.0	51.2	13.2	74.8	n/a	n/a			
08/08/2012	UM13B1-rutile16	6790		132667	109563	276712	1992001	6798	3.8	13.8	299	79	0.8073	0.85	15.5131	1.75	0.1394	1.53	0.873	4934.7	12.2	841.1	24.1	2847.3	32.9	17.0	70.5	n/a	n/a			
08/08/2012	UM13B1-rutile17	528		13636	8787	23081	107280	5518	0.2	1.4	16	64	0.6552	1.96	1.5918	6.16	0.0176	5.84	0.948	4635.5	28.3	112.6	13.0	967.0	74.0	2.4	88.4	n/a	n/a			
08/08/2012	UM13B1-rutile18	7121		136943	113170	273262	327696	1929	2.2	14.2	49	23	0.8233	1.24	57.2356	2.60	0.5042	2.29	0.880	4962.5	17.6	2631.9	98.3	4127.0	50.7	53.0	36.2	n/a	n/a			
08/08/2012	UM13B1-rutile19	8776		163694	137147	338668	602331	6463	1.2	17.0	90	76	0.8093	0.97	20.4824	1.71	0.1836	1.41	0.823	4938.2	13.8	1086.4	28.1	3114.4	32.6	22.0	65.1	n/a	n/a			
08/08/2012	UM13B1-rutile20	2306		46376	38083	95877	207139	2924	0.9	4.8	31	34	0.8000	1.88	12.4059	3.78	0.1125	3.28	0.868	4921.7	26.8	687.1	42.6	2635.6	68.7	14.0	73.9	n/a	n/a			
	X002 Titanite																															
08/08/2012	X002-I-Titanite1	108		508	110	1003	375108	971	5.0	0.1	56	11	0.2221	7.75	0.1528	8.93	0.0050	4.44	0.498	2996.0	124.6	32.1	2.8	144.4	23.8	1.1	77.8	n/a	n/a			
08/08/2012	X002-I-Titanite2	37		1977	109	4062	1978430	4468	5.7	0.2	297	52	0.0521	5.03	0.0293	5.38	0.0041	1.90	0.353	287.8	115.0	26.3	1.0	29.3	3.1	9.1	10.4	n/a	n/a			
08/08/2012	X002-I-Titanite3	-61		981	287	1415	389822	1745	2.9	0.1	58	20	0.2861	6.58	0.2089	7.39	0.0053	3.37	0.456	3396.4	102.5	34.1	2.3	192.6	25.6	1.0	82.3	n/a	n/a			