Precise microbeam dating defines three Archaean granitoid suites at the southwestern margin of the Kaapvaal Craton.

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ABSTRACT

Precise microbeam U-Pb zircon dates have been determined for 17 granitoid samples which crop out along the southwestern margin of the Kaapvaal Craton. In the Marydale High two main types of granitoid are distinguished mainly by their normative Quartz - Alkali Feldspar – Plagioclase mineral proportions. The Draghoender Granite type is generally tonalitic to trondhjemitic and some samples have very low heavy Rare Earth Elements, probably originating as melts of eclogitic protoliths. Their ages vary by ~50 Ma from 2946 ±9 Ma to 2892 ±6 Ma (2σ), reflecting a long period of magmatism possibly due to subduction. The granodioritic to monzogranitic Skalkseput Granite type intrudes the Draghoender granite in places and has a coherent age of 2901 ±14 Ma. These two granite types thus overlap in time and space. The more evolved Skalkseputs type could have been derived by melting of the Draghoender type during assembly of the Kaapvaal Craton by collision of the Kimberley and Witwatersrand Terranes.

A third granite type is exemplified by the 2721 ±6 Ma monzogranitic Steenkop Granite Gneiss which occurs south of Prieskapoort, and corresponds in age to a 2718 ±8 Ma monzogranite dyke which intrudes a 2871 Ma Skalkseput monzogranite. The previous age of 2718 ±8 Ma for the Skalkseput Granite probably also dated a Steenkop-type dyke. A basal conglomerate to the Zeekoebaard Formation of the Ventersdorp Supergroup has a single 2720 ±4 Ma detrital zircon population.

South of the Marydale High a narrow strip of Draghoender-type Granite extends to Franzenhof where it is exposed in a Dwyka glacial outwash surface and is dated at 2931 ±9

Ma. The southernmost exposures of granite are windows in the Dwyka group about 130 km southeast of Marydale on both sides of the Doornberg Fault. The 2905 ±7 Ma Maritzdam Granite which is basement to Ventersdorp Supergroup volcanic rocks at Kuip is monzogranitic and corresponds to the Skalkseput type. On the southwest side of the Doornberg Fault the 2907 ±4 Ma Welgevonden Granite underlies Marydale Group volcanic rocks, showing that the Kaapvaal basement extends across the fault.

Keywords: Kaapvaal basement; Archaean granite; U-Pb microbeam zircon dating; Lu-Hf zircon;, crustal evolution; Kimberley Terrane.

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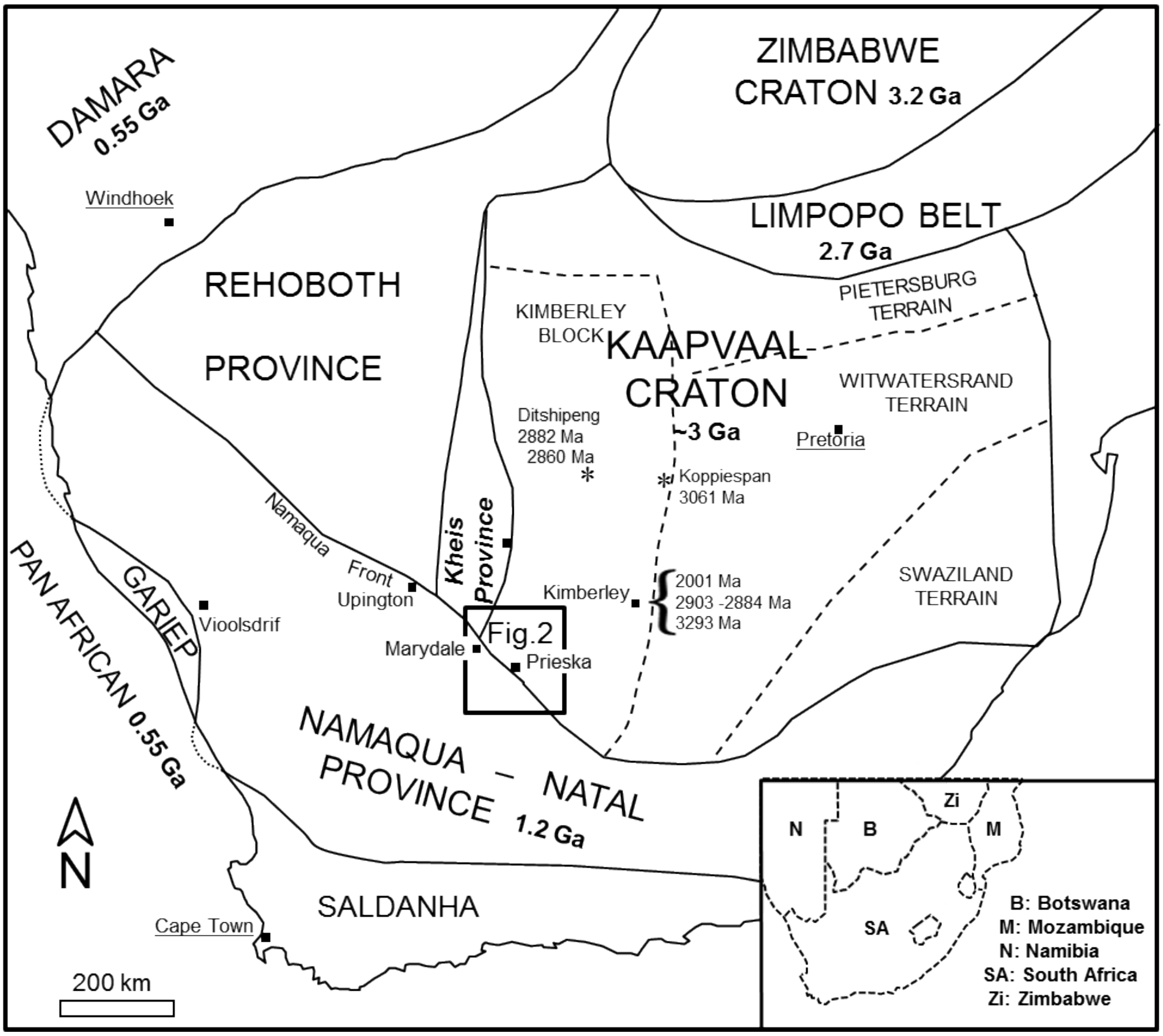


Figure 1. Precambrian structural provinces of southern Africa showing the locality of the study area (Fig. 2) at the southwestern margin of the Kaapvaal Craton. Selected precise U-Pb ages of other granitoids in the basement of the Kimberley Terrane are shown.

1. Introduction

The southwestern margin of the Kaapvaal Craton is marked by a dramatic transition from the undeformed Archaean basement granites and cover sequence of the craton to highly deformed and metamorphosed granitic and supracrustal rocks of the Mesoproterozoic Namaqua-Natal Province, shown in Fig. 1. The Marydale Terrane shown in Figure 2 lies between the two provinces and corresponds broadly to the dextral Doornberg Lineament of Vajner (1974b), bounded by the Doornberg Fault and Brakbos Shear Zone.

Granites are exposed along the Doornberg Fault. North of the fault they are unconformably overlain by the Kaapvaal volcanosedimentary cover sequence comprising ~2.7 Ga

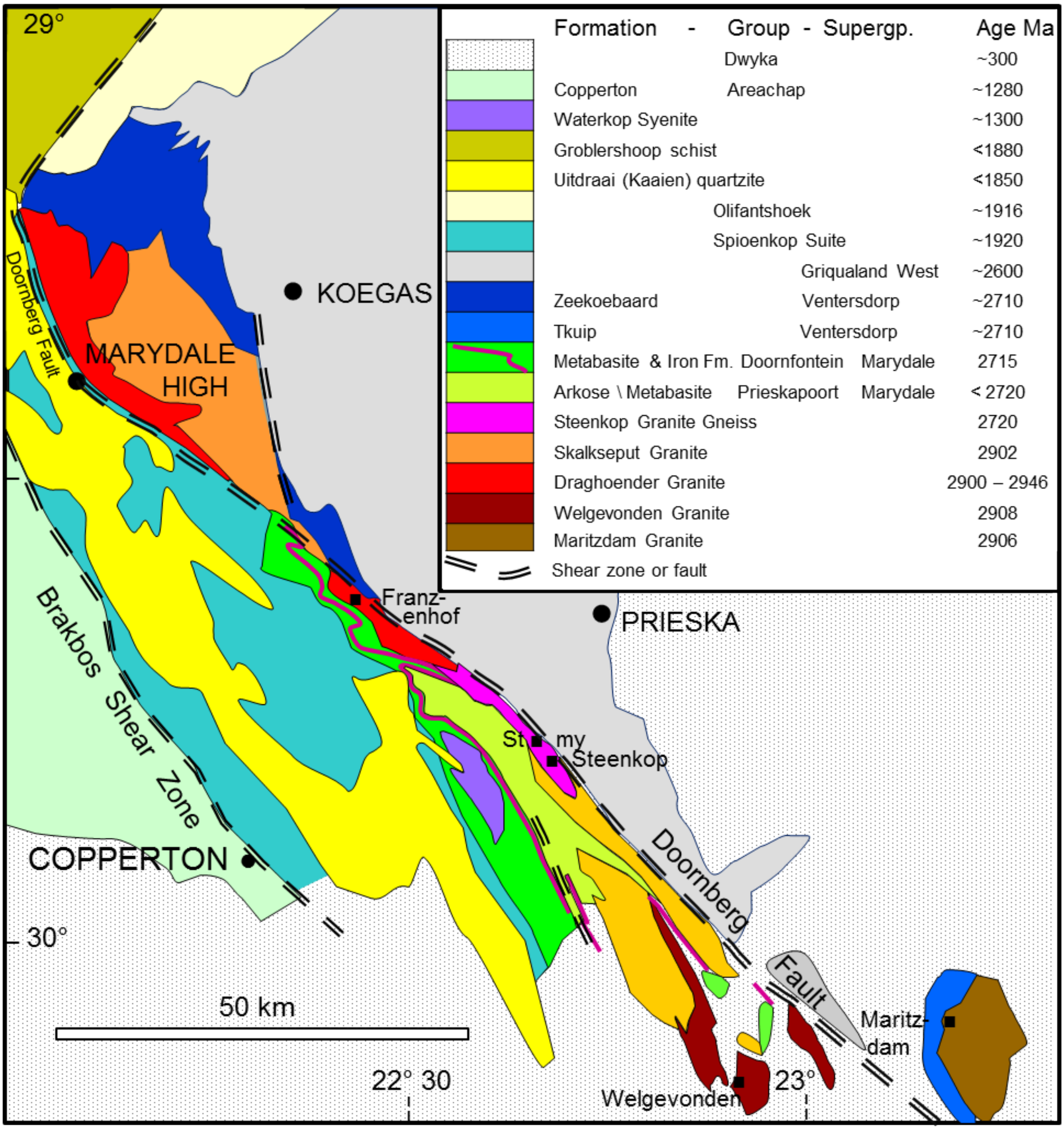


Figure 1. Geological map showing the granites exposed on the southwestern margin of the Kaapvaal Craton. The Marydale Terrane lies between the Doornberg Fault and Brakbos Shear Zone. The Marydale High is the area underlain by the Draghoender and Skalkseput Granites between Marydale and Koegas. Sample localities south of the Marydale High are indicated as follows. Franzenhof Granite DC1517; Steenkop Granite Gneiss DC00121; St my: Mylonitised Steenkop Granite DC01120 from Prieskapoort; Welgevonden Granite DC1333; Maritzdam Granite from the T'kuip window of basement granite overlain by Ventersdorp Supergroup volcanic rocks.

Ventersdorp and ~2.6 -2.2 Ga Griqualand West Supergroups and are clearly Kaapvaal basement granites. Granites also crop out south of the Doornberg fault in the Marydale Terrane, but their stratigraphic affinity is not obvious. In some places these granites are overlain by arkoses and metabasalts of the Marydale Group, but it has not been established whether the contact is unconformable or tectonic. The Marydale stratigraphy dips south-westwards but increases in grade upwards from greenschist to granulite, indicating that it is a thrust sequence, as is clearly seen in the isoclinal nappes of the Uitdraai Quartzites at the structural top of the sequence.

In this work we investigate the geochronology and geochemistry of the granites of this region in some detail and their relations across the Doornberg Fault. We establish the existence of three suites, each of which has characteristic composition and age.

1.1 The Marydale high

By far the largest exposure of granites in the area, between Marydale and Koegas (Fig. 2), is termed the Marydale high (Stowe, 1986, Altermann and Halbich 1991), because it has clearly been uplifted relative to the Kaapvaal supracrustal rocks to the east. To the east it is overridden by thrusts of Spioenkop Suite metabasites and Uitdraai quartzites. Vajner (1974a) mapped and distinguished two granites in the Marydale High which represent the Kaapvaal basement because they are unconformably overlain by the Seekoebaard andesites of the ~2.7 Ga Ventersdorp Supergroup. The supposedly older Draghoender Granite in the north-western part is rather heterogeneous, the normal type being a white to grey muscovite-biotite granite, commonly deformed and containing pegmatitic veins. The Skalkseput Granite which intrudes the Draghoender in places, is a more homogeneous light grey biotite muscovite granite and frequently K-feldspar porphyritic. The two varieties are not easy to distinguish in the field. The boundary between the two types is shown in Figure 4, following Malherbe and Moen (1991), which differs slightly from that of Vajner (1974b). Large xenoliths of Draghoender-like granite were found in the Skalkseput Granite by Vajner (1974a).

1.2 Previous ion probe dating in the Marydale High

Three granite samples were dated by the U-Pb zircon ion probe method, reported in an abstract by McCourt et al., (2000), using data from a thesis by Hilliard (1999). They reported a ^{207}Pb-^{206}Pb age of 2853 ±4 Ma for a Draghoender Granite sample. A Skalkseput Granite sample gave a 3111-2930 Ma spread of ages and another sample previously analysed by R.

Armstrong gave an ^{207}Pb-^{206}Pb age of 2718 ±8 Ma (but no data are available for this sample). Precise coordinates have not been documented for these samples, two of which are located as sample numbers on the regional map of Hilliard (1999). He reported an intrusive contact between what he termed the Skalkseput Granite and the Zeekoebaart Formation (Ventersdorp Supergroup) and 'assuming that the Skalkseputs Granite comprises only one generation of granitoid intrusives', concluded that the Zeekoebaart Formation is older than 2718 ±8 Ma.

2. Methods

Samples were collected as about 1 kg of cm-sized fragments. They were coarsely crushed in a chrome steel swing mill and a whole rock aliquot separated by cone-and halving, then finely ground. Zircon was extracted from the rest of the samples by crushing to pass a 400 micron sieve, then washed and manually panned to concentrate the heavy minerals. Zircon grains were hand–picked and mounted in epoxy pucks for SEM imaging.

Geochemical analyses were done by commercial labs using XRF and ICPMS and given in Table 1 and Appendix A1.

Microbeam U-Pb zircon dating was done at three labs by methods briefly described below. For more detail see Cornell et al, (2016). The complete U-Pb data are given in appendix A2. At the University of Oslo, Norway Laser ablation multicollector ICPMS zircon dating was done on three samples using a 213 nm Nd-YAG laser ablation sampler with 40 micron spot size and analysed for U and Pb isotopes, following the method described by Andersen et al., (2009). Common lead corrections were not applied due to the difficulty of distinguishing ^{204}Pb from ^{204}Hg in the system, but points with high common lead were omitted, identified by low $^{206}Pb/^{204}Pb$ ratios and ^{204}Pb signal higher than the ^{204}Pb-free zircon standard 91500. The same zircon grains were analysed for Lu-Hf with a 60 micron rectangular spot as described by Cornell et al. (2012), and the data is presented in the appendix A3.

Laser Ablation Inductively Coupled Plasma high-resolution mass spectrometric data for 11 samples were obtained at the Central Analytical Facility, Stellenbosch University, employing a Thermo Finnigan Element 2 mass spectrometer coupled to an ASI Resolution M50-E excimer laser ablation system. Single spot analyses had 20 μm diameter and crater depth 10-15 μm. The methods employed for analysis and data processing are similar to those described by Frei and Gerdes (2009) and common lead corrections were made where required.

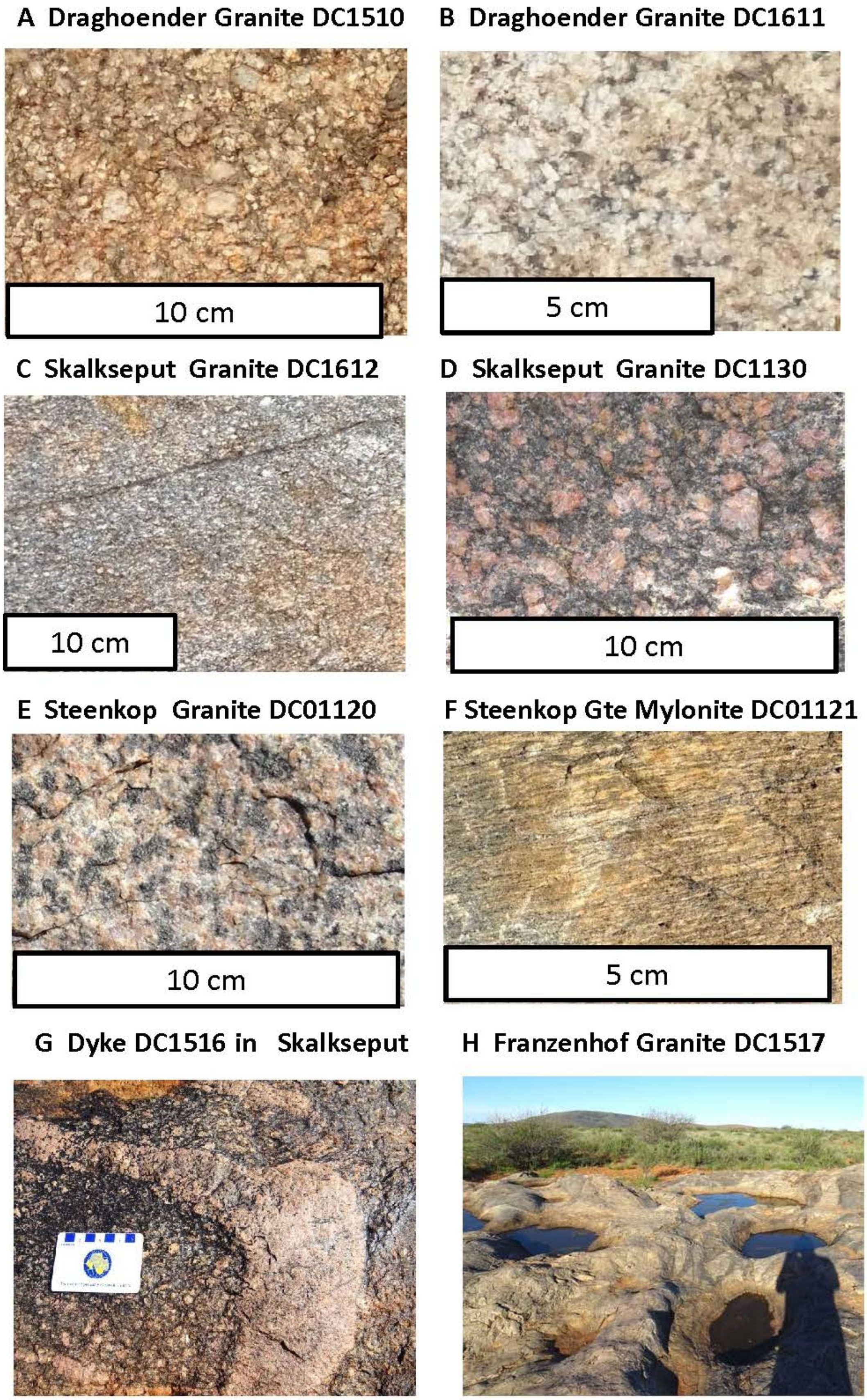


Figure 3. Field pictures of samples taken in this work. Image H shows a rejuvenated Dwyka glacial outwash surface at Franzenhof.

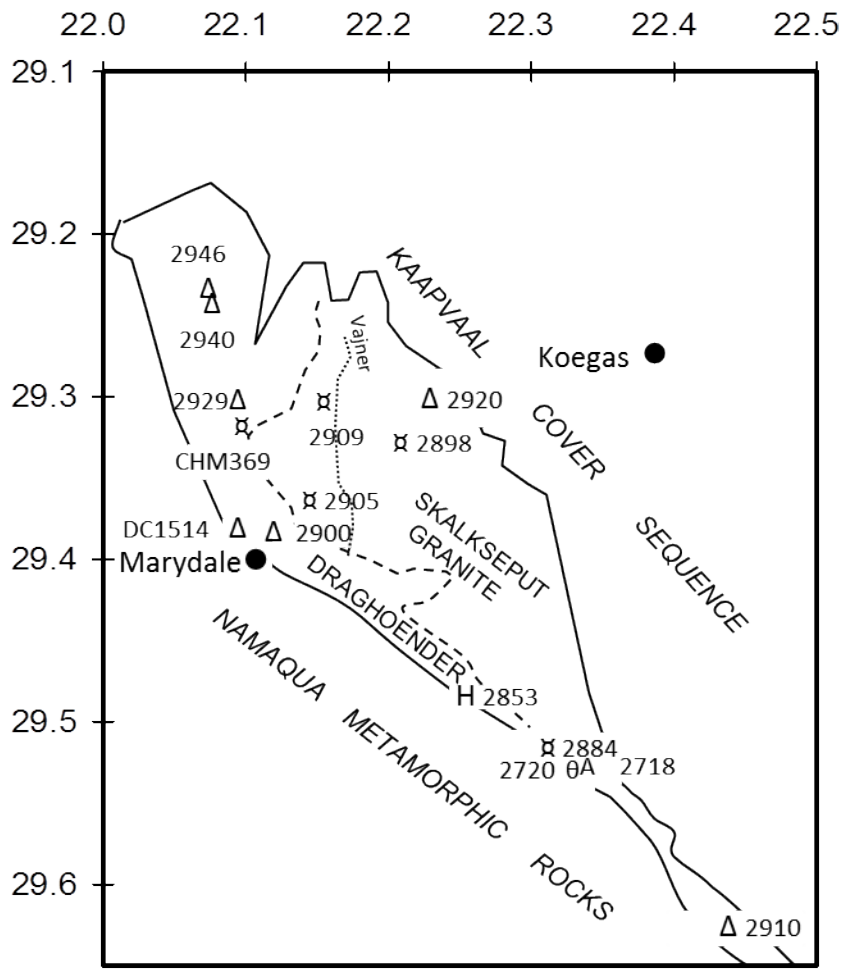


Figure 4. Precise U-Pb zircon dates for Kaapvaal basement granitoid samples exposed in the Marydale High, with localities marked by symbols. Δ indicates Draghoender type tonalitic rocks with low QAP normative alkali feldspar (4-12%). ¤ indicates Skalkseput – type granodioritic rocks with higher QAP normative alkali feldspar (22-29%). θ indicates younger (2720 Ma) monzogranite dykes coeval with the Steenkop Granit. The sample numbers corresponding to ages can be found in Table 2. Samples for which norms but not dates are available are shown with sample numbers. The H 2853 Ma age shown is by ion probe for Draghoender Granite from Hilliard 1999 and the A 2718 Ma age shown is an ion probe age by Richard Armstrong for his Skalkseputs Granite, referred to in Hilliard 1999 and McCourt et al., (2000) and considered in this work to represent a Steenkop – aged dyke which we sampled at this locality. Precise locations for these two samples are not available. The dashed line is the Draghoender – Skalkseput boundary according to the Council for Geoscience 1:250 000 Prieska map sheet of Malherbe and Moen 1991. Where it differs from that, the boundary according to Vajner 1974a is shown as a dotted line.

Th-U–Pb zircon dating was also done for three samples using the NordSIM ion probe as described by Whitehouse and Kamber (2005). A ~10 micron spot size was used and the NIST 91500 zircon standard was used for calibration. Common Pb corrections assume a present day Stacey and Kramers (1975) model average terrestrial Pb composition. The ion probe U–Pb data are given in the appendix A2. All U–Pb age calculations were made using the Isoplot 3 programme of Ludwig (2012). Uncertainties of age calculations are all given at the 2σ level, ignoring decay constant errors.

3. Samples in the Marydale High

Twelve granite samples were taken from the Marydale High. Their localities are shown in Figure 3. Eleven of them were originally classified as Draghoender or Skalkseput Granite according to the map of Malherbe et al, (1991), and their stratigraphic affinity is further examined below. The sample were generally taken from small outcrops which were separated by large areas of sub-outcrop. Some of the outcrops showed morphological features such as polished surfaces and potholes suggesting that they were Dwyka glacial outwash surfaces. One sample DC1516 was taken from a small group of meter-wide dykes which intrude Draghoender Granite near a prominent road cutting in the south of the Marydale High and this is thought to be the rock which McCourt et al. (2000) regarded as Skalkseput Granite. Near this locality (110 m northeast) is a small outcrop of deformed conglomerate comprising quartzite pebbles in a micaceous matrix. The field relationships with the surrounding granites were not apparent and this could represent either a xenolith or an unconformably overlying part of the Zeekoebaard Formation, regarded as a Ventersdorp Supergroup correlate. This was also sampled for detrital zircon dating (DC1515).

4. Granites southward astride the Doornberg Fault

The Marydale high is bounded on both sides by branches of the Doornberg Fault, which dies out northward on the east side but continues past Marydale on the west (Figure 1), where intense late movements on the fault generated thin veins of pseudotachylite in the Marydale amphibolites (Cornell, 1974). South of the Marydale high the main Doornberg Fault is a single shear zone in which several phases of deformation can be recognized e.g. at Prieskapoort (Scott, 1987). Granitoids are exposed on both sides of the fault. An important question is whether those to the southwest are the same as those to the northeast. To investigate this, samples were taken at four localities southwest of the fault, indicated by letters in Figure 1. At Franzenhof (Fr) sample DC1517 was taken from a Dywka glacial outwash surface with polished rounded topography and many potholes as showjn in Figure 3H.

Sample equivalent	DC1510	DC1512	DC1513	DC1514	DC1516	DC1517	DC1518	DC1610	DC1611	DC1612	DC1613	CHM365 DC01120	CHM369	CHM371 DC1332	CHM372 DC1130	2583	4425	4424
Sample taken as	Draghoender Granite	Skalkseput Granite glacial surface	Skalkseput Granite large outcrop	Draghoender Granite	Dyke in Skalkseput	Franzenhof Granite fluvoglacial surface	Maritzdam Granite at Kuip	Draghoender Granite	Draghoender Granite	Skalkseput Granite	Skalkseput Granite	Steenkop Granite (type locality)	Draghoender Granite	Draghoender Granite	Skalkseput Granite	Draghoender Granite from Vajner 1974	Skalkseput Granite from Vajner 1974	Skalkseput Granite from Vajner 1974
Geochem type	Draghoender	Skalkseput	Skalkseput	Draghoender	Steenkop	Draghoender	Skalkseput	Draghoender	Draghoender	Skalkseput	Draghoender	Steenkop	Skalkseput	Draghoender	Skalkseput	between D&S	Skalkseput	Skalkseput
Lat. °S	29.2444	29.3643	29.3042	29.3860	29.5159	29.6283	30.1425	29.2364	29.3041	29.3288	29.3055	29.8110	29.31759	29.3857	29.5163	unknown	unknown	unknown
Lon. °E	22.0746	22.1443	22.1529	22.0853	22.3112	22.4341	23.2251	22.0716	22.0904	22.2085	22.2247	22.6850	22.09434	22.1171	22.3109			
SiO_2	70.11	74.14	74.24	72.36	75.93	73.05	70.08	70.67	69.05	75.24	75.93	74.27	74.49	72.34	71.24	73.14	71.00	77.91
TiO_2	0.24	0.14	0.11	0.25	0.12	0.21	0.45	0.24	0.29	0.05	0.08	0.58	0.08	0.21	0.36	0.16	0.35	0.10
Al_2O_3	16.29	14.27	14.47	15.44	12.57	14.92	14.66	15.75	16.02	13.86	13.77	12.37	14.16	15.01	14.96	14.24	14.53	12.59
Fe_2O_3	2.27	1.68	1.28	2.20	1.73	1.73	3.04	1.99	2.04	0.51	0.67	3.17	1.36	2.13	2.31	1.54	2.36	0.67
MnO	0.035	0.027	0.033	0.028	0.020	0.042	0.040	0.040	0.020	0.010	0.020	0.045	0.021	0.033	0.034	0.02	0.03	0.01
MgO	0.57	0.14	0.03	0.32	<0.01	0.40	0.67	0.040	0.02	0.01	0.02	0.30	0.01	0.38	0.46	0.31	0.62	0.33
CaO	3.06	1.17	0.78	2.77	0.39	1.82	1.34	0.58	0.72	0.07	0.24	1.40	0.81	2.31	1.49	1.43	1.67	0.52
Na_2O	5.42	4.41	4.70	5.56	3.34	5.02	3.87	2.92	3.51	0.41	1.43	3.41	4.15	5.12	4.01	5.21	4.24	4.48
K_2O	0.99	3.60	3.70	0.72	5.24	1.84	4.88	5.29	5.66	4.64	5.49	4.15	4.69	1.49	4.54	3.12	4.10	3.77
P_2O_5	0.094	0.054	0.057	0.111	0.036	0.120	0.227	0.980	0.950	4.070	1.060	0.148	0.029	0.099	0.144	0.080	0.120	0.050
Cr_2O_3	0.007	0.005	0.006	0.006	0.004	0.007	0.005	0.090	0.110	0.100	0.020	0.007	0.007	0.005	0.005	0.015	0.010	0.010
LOI	0.87	0.33	0.42	0.58	0.30	0.88	0.71	1.08	1.04	0.55	0.67	0.22	0.29	0.57	0.47	0.66	0.68	0.40
Total	99.97	99.97	99.82	100.35	99.56	100.05	99.97	99.63	99.41	99.51	99.38	100.06	100.11	99.69	100.03	99.92	99.70	100.84
CIPW-normative minerals wt%																		
Quartz	26.9	31.51	30.84	30.33	35.12	32.16	24.58	28.8	24.04	32.11	36.8	34.41	30.13	30.9	26.26	27.17	25.76	35.54
Plagioclase	61.1	42.96	43.55	60.29	30.24	51.25	38.33	59.67	64.52	41.07	54.11	34.95	39.11	54.79	40.63	50.8	43.9	39.99
Orthoclase	5.91	21.39	21.98	4.25	31.2	10.99	29.13	5.91	5.73	24.29	6.32	24.64	27.78	8.92	27.01	18.62	24.52	22.22
Corundum	0.98	1.13	1.47	0.76	0.78	1.65	1.11	0.89	0	1.34	1.07	0.08	0.86	0.99	1.09	0	0.37	0.31
Diopside	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0	0
Hypersthene	3.77	2.12	1.42	3	1.85	2.77	4.58	3.5	3.27	0.71	1.29	3.56	1.51	3.15	3.32	2.21	3.81	1.45
Ilmenite	0.46	0.28	0.21	0.47	0.23	0.4	0.85	0.46	0.57	0.09	0.15	1.1	0.15	0.4	0.68	0.3	0.66	0.19
Magnetite	0.67	0.49	0.38	0.64	0.51	0.51	0.88	0.58	0.61	0.14	0.20	0.93	0.39	0.62	0.67	0.45	0.7	0.19
Apatite	0.23	0.12	0.14	0.25	0.09	0.28	0.53	0.21	0.25	0.23	0.05	0.35	0.07	0.23	0.32	0.19	0.28	0.12
rock type	Tonalite	Granodiorite	Granodiorite	Tonalite	Monzogranite	Granodiorite	Monzogranite	Tonalite	Tonalite	Monzogranite	Granodiorite	Monzogranite	Monzogranite	Granodiorite	Monzogranite	Granodiorite	Monzogranite	Monzogranite
Q% in QAP	29	33	32	32	36	34	27	31	25	33	38	37	31	33	28	28	27	36
A%	6	22	23	4	32	12	32	6	6	25	7	26	29	9	29	19	26	23
P%	65	45	45	64	31	54	42	63	68	42	56	37	40	58	43	53	47	41

Table 1. Major element analyses and normative data for granitoid samples from the Southwestern margin of the Kaapvaal Craton.

Sample	Stratigraphic unit taken	type	Lat. S Deg	Lon. E Deg	Zircon age domains seen in SEM images	method	Age Ma	± 2σ	lower intercept age Ma	± 2σ	probability	xenocryst ages Ma	comments
DC1610	Draghoender tonalite	Drag-hoender	29.236	22.072	Main CL-grey with oscillatory zonation. A few cores CL-bright and truncated zonation.	discordia LA HR ICPMS	2946	9	13	120	1	3 cores analysed not older	Concordia age 2942 ± 8 agrees
DC1510	Draghoender tonalite	Drag-hoender	29.244	22.075	Main CL-grey with zonation. Cores CL-bright and truncated zonation.	discordia LA HR ICPMS	2940	6	66	77	1	3160 -3000	Concordia age 2937 ± 7 agrees
DC1611	Draghoender	Drag-hoender	29.304	22.090	Mains CL-dark, some zoned xenocryst cores	discordia LA HR ICPMS	2929	11	-18	140	0.42	3125 - 3020	Concordia age agrees: 2936 ±15 Ma
DC1513	Skalkseput	Skalk-seput	29.304	22.153	Mains CL-dark but oscillatory zoned, cores CL-bright	discordia LA HR ICPMS	2909	9	-1	12	1	none older	Cores all coeval with mains, perfect recent lead loss model, one concordant point.
DC1613	Skalkseput	Drag-hoender	29.305	22.225	Mains CL-dark, some cores seen in BS images	discordia LA HR ICPMS	2920	18	274	420	0.49	3390 - 3000	>15% discordant points show complex lead loss.
DC1612	Skalkseput	Skalk-seput	29.329	22.208	Mains CL-dark, cores CL-bright	discordia LA HR ICPMS	2898	7	-13	53	1	none older	Cores all coeval with mains, concordia age agrees: 2897 ±7 Ma.
DC1512	Skalkseput	Skalk-seput	29.364	22.144	Mains CL-grey, cores CL-bright	discordia LA HR ICPMS	2905	8	54	70	0.79	3155 & 3120	Cores mostly coeval with mains, concordia age agrees: 2903 ±9 Ma.
DC1332	Draghoender	Drag-hoender	29.386	22.117	Mains CL-dark but oscillatory zoned, cores CL-bright & truncated, thin rims CL-bright	discordia SIMS	2900	6	-42	72	0.78	3040	Only 6 points of 15 conform, others show scatter probably reflecting complex lead loss. Overall regression: 2893 ± 17 Ma.
DC1515	Seekoebaard conglomerate	Steen age	29.515	22.312	Two main groups, CL-dark and CL-bright, generally unzoned.	discordia LA HR ICPMS <20% discordant	2720	4	97	95	1	one younger 2633 ± 34 Ma point >10% discordant	Concordia agrees, remarkable single detrital age population suggests derived from Ventersdorp - aged magmatic rocks.
DC01130	Skalkseput	Skalk-seput	29.516	22.311	Mains CL-dark & oscillatory zoned, cores CL-bright.	discordia LA MC ICPMS	2884	22	277	49	0.16	not analysed	Ancient lead loss, 277 Ma corresponds to Karoo Dwyka glaciation and diagenesis.
DC1516	Dyke in Skalkseput (DC1130)	Steen-kop	29.516	22.311	Mains CL-dark with some zonation, few CL-bright xenocrysts.	discordia LA MC ICPMS	2720	10	287	200	0.997	one core same age as mains	Ancient lead loss, more discordant points trend towards origin. Concordia age agrees: 2720 ± 10 Ma.
DC1517	Franzenhof granodiorite	Drag-hoender	29.628	22.434	Mains are CL-grey with slight zonation, cores are CL-bright with truncated zonation.	discordia LA HR ICPMS <20% discordant	2 912	10	-72	8	0.69 0.99	3105-2945	Concordia age agrees; including >20% discordant points gives intercepts, 200 & 2930 Ma.
DC00121	Steenkop mylonite	Steen-kop	29.785	22.667	Broken grains, both CL-dark and zoned, thin CL-bright or dark metamorphic rims	Pb-Pb age LA MC ICPMS	2720	10	fixed at 0	50	0.97	2859 - 2792 one metamorphic (?) grain 2126	Unconstrained lower intercept -166 ± 490 Ma. Concordia age agrees: 2715 ± 14 Ma.
DC01120	Steenkop type locality	Steen-kop	29.810	22.688	Mains CL-dark but oscillatory zoned, cores CL-bright with main rims	discordia LA MC ICPMS	2719	4	fixed at 0	50	0.6	2830	Unconstrained lower intercept -77 ± 320 Ma. Concordia age agrees 2719 ±6 Ma. Agrees with SIMS analysis below.
						discordia SIMS	2720	5	fixed at 0	50	0.63	not analysed	Unconstrained lower intercept 151 ± 180 Ma. Concordia age agrees 2722 ± 7 Ma. Agrees with LA-MC-ICPMS above.
DC1518	Ongers River	Skalk-seput	30.143	23.225	Mains CL-dark with some metamict zones, a few discordant CL-grey cores	concordia LA HR ICPMS	2906	8	300	350	0.9	none older	Ancient lead loss, >10% more discordant points scatter. Concordia age agrees: 2905 ± 7 Ma.
DC1333	Welgevonden	Skalk-seput?	30.158	22.908	Mains CL-grey & zoned, some metamict zones; a few CL-bright resorbed cores.	discordia SIMS	2908	4	115	67	0.18	3051 & 3001	Concordia age agrees: 2907 ± 5 Ma.

Table 2. Summary of age determinations and calculations.

At Prieskapoort a mylonised variety of the Steenkop Granite was taken, sample DC00121 (St my). At Steenkop (St) sample DC01120 was taken from the type locality of this biotite-flecked monzogranite gneiss. A poorly exposed granite sample was taken on the farm Welgevonden (sample DC1333, Wel), the southernmost exposure before Dwyka cover becomes total. One sample from northeast of the Doornberg Fault was taken at the Maritzdam, (sample DC1518), which underlies the exposure of Ventersdorp lavas at Kuip, also an inlier in the Dwyka cover.

5. Results

CIPW norms for the samples analysed are given in Table 3 of the ancillary data. Data for three granite samples from the Marydale High taken by Vajner (1974a) were also considered. Diagrams based on normative mineralogy proved useful in distinguishing three granite types as shown in Figure. 5. Further geochemical discrimination using major elements is shown in Figure 6 and a tectonic discrimination diagram in Figure 7. The U-Pb zircon microbeam data are shown in concordia diagrams with age calculations in Figure 8. The zircon age domains, details and comments about the geochronological results are summarized in Table 2. Rare Earth Element diagrams are shown in Figure 9. The zircon Lu-Hf isotope data for twelve samples are plotted in Figure 10. The CHUR values are from Bouvier et al. (2008) and the DM values are from Griffin et al. (2004) modified to the CHUR values from Bouvier et al. (2008) and the decay constant of ^{176}Lu from Söderlund et al. (2004).The geochemical and age data are discussed together in the following section.

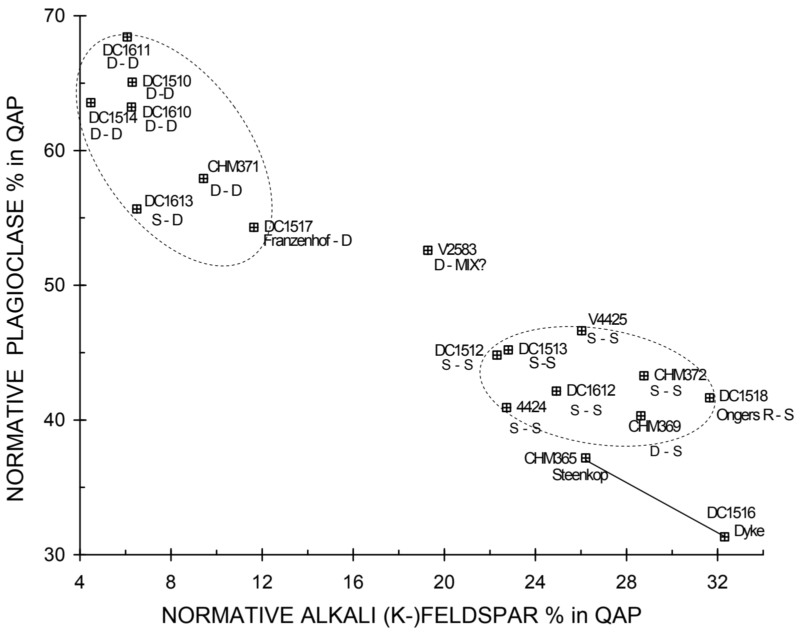


Figure 5. Normative Quartz – Alkali feldspar – Plagioclase (QAP) mineral proportions for Granite samples from the southwestern margin of the Kaapvaal Craton including the Marydale high and outcrops southwards on both sides of the Doornberg Fault. Three types are distinguished as shown. The Draghoender and Skalkseput types overlap in U-Pb zircon age and the Steenkop type samples are significantly younger at ~2720 Ma.

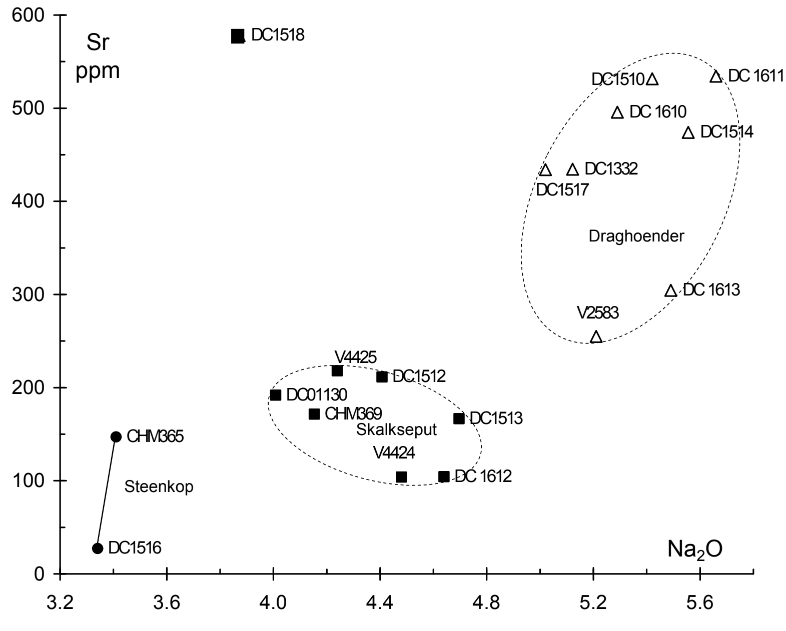


Figure 6. Geochemical distinction of granite samples from the Southwestern Kaapvaal Craton. Three types are apparent, the Draghoender (triangles) and Skalkseputs (blocks) granites which overlap in age and the younger ~2720 Ma Steenkop type.

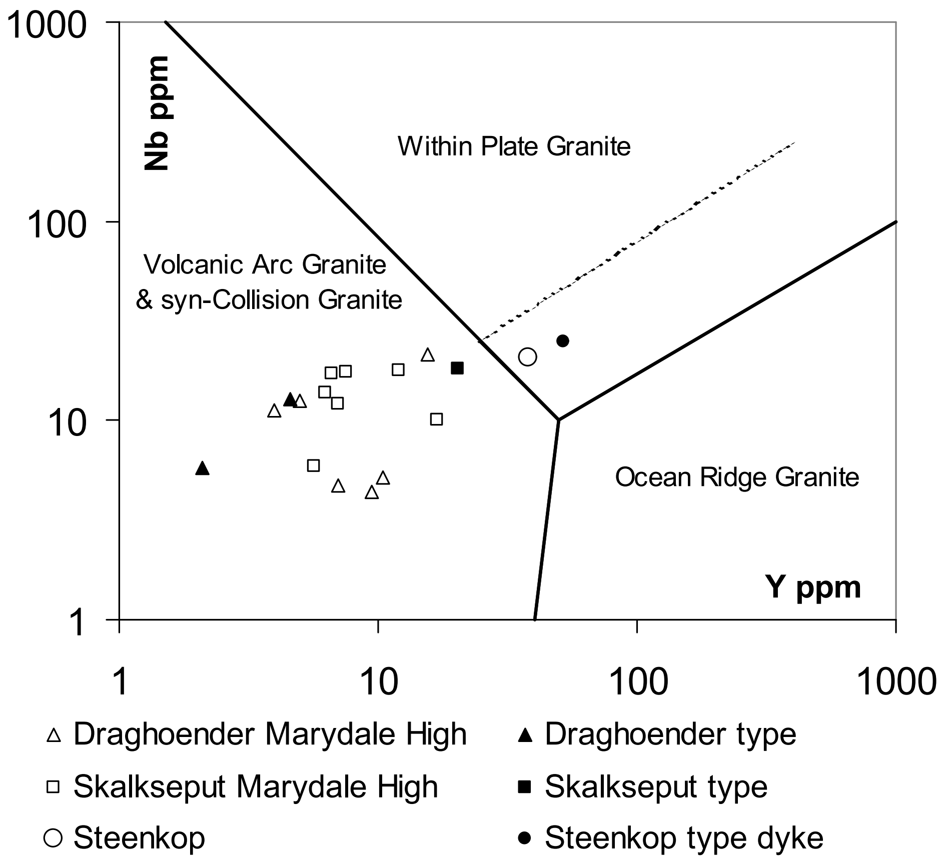


Figure 7 Tectonic discrimination diagram for granites.

6. Discussion

6.1 Stratigraphic identity of Draghoender and Skalkseput Granites

There is some uncertainty about the boundary between the Draghoender and Skalkseput Granites in the Marydale High. Vajner (1974a) and Malherbe et al, (1991), mapped different boundaries in the central Marydale High as shown in Figure 4. We used the latter boundary which corresponds best to our results. The stratigraphic affinity of samples taken further south on either side of the Doornberg Fault is also not clear. Criteria were sought which could distinguish the Draghoender and Skalkseput Granites. Normative mineralogy proved to be useful, in that most of the samples taken as Draghoender Granite classify as tonalites on a normative Quartz-Akali Feldspar-Plagioclase (QAP) plot, whereas most of the Skalkseput samples are granodiorite or monzogranite with 22 to 29% A. This is clearly shown in the A-P plot in Figure 5, which is labelled with sample numbers and symbols e.g. D – S indicating taken as Draghoender, classified as Skalkseput type, with 4.5 to 13% A,

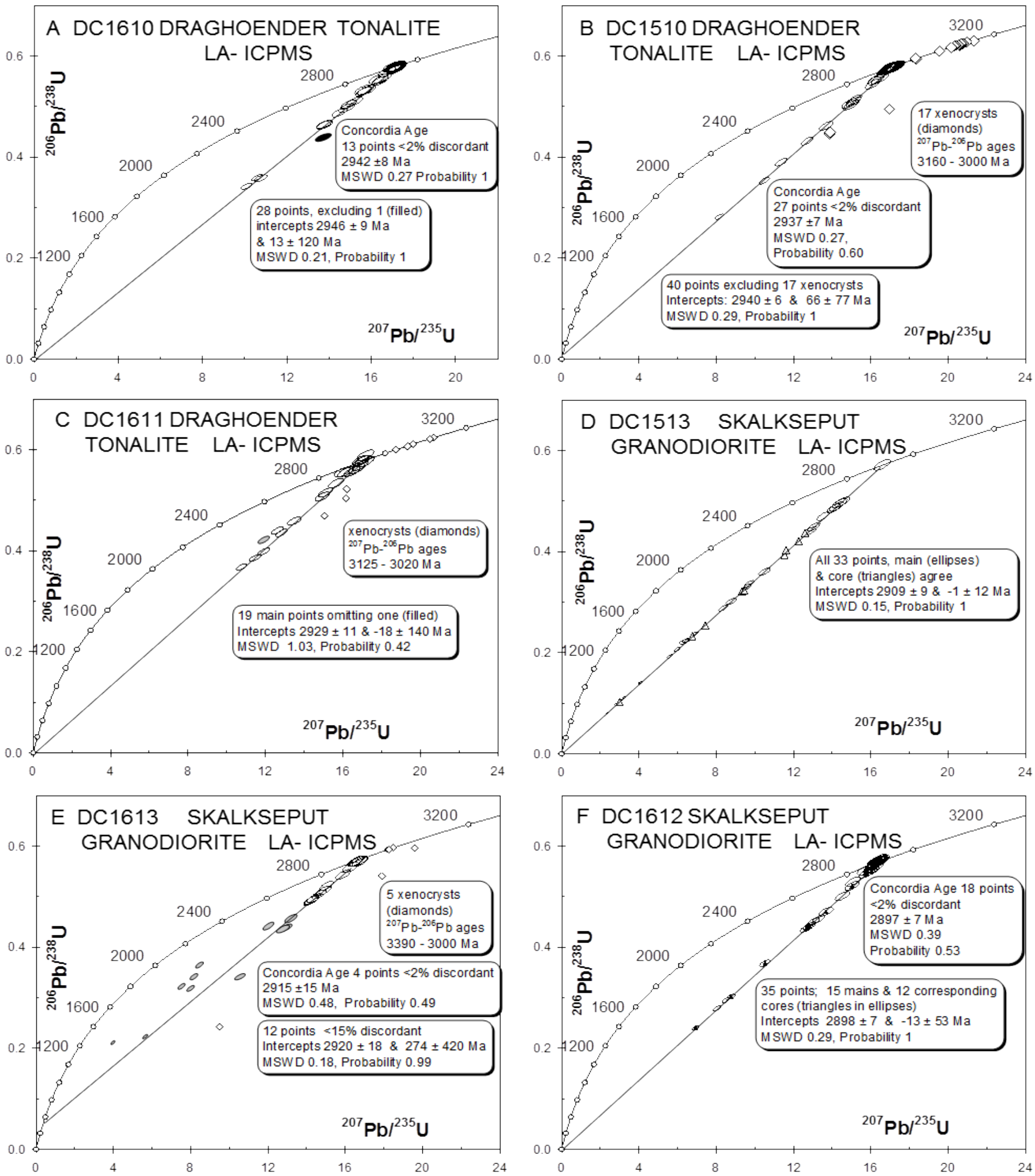


Fig. 8-1. Concordia diagrams showing the U-Pb zircon data and calculations for six samples from the Marydale High, arranged in order of latitude south, following Table 2. Error ellipses are all shown at 1σ but age calculations at the 2σ confidence level.

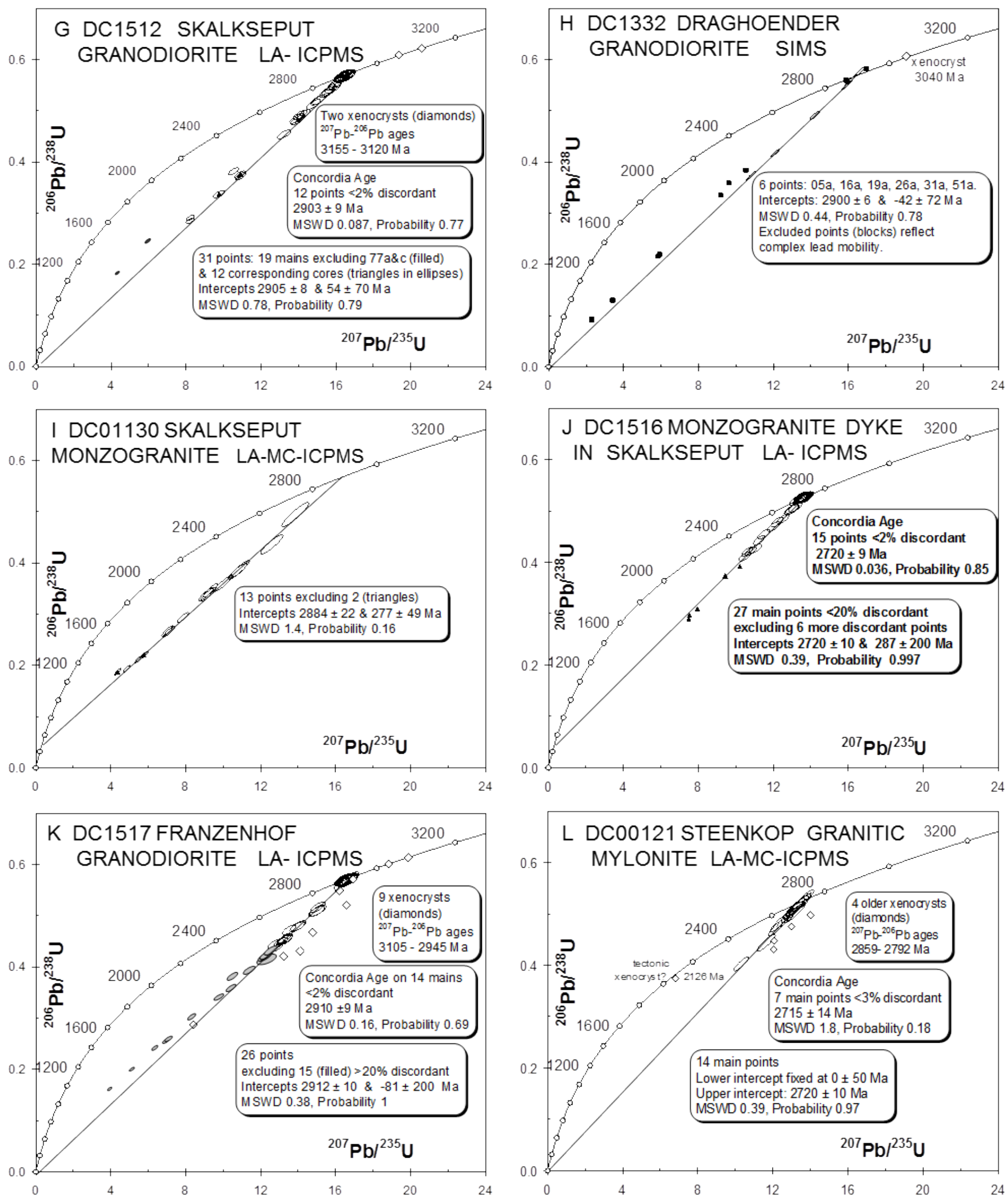
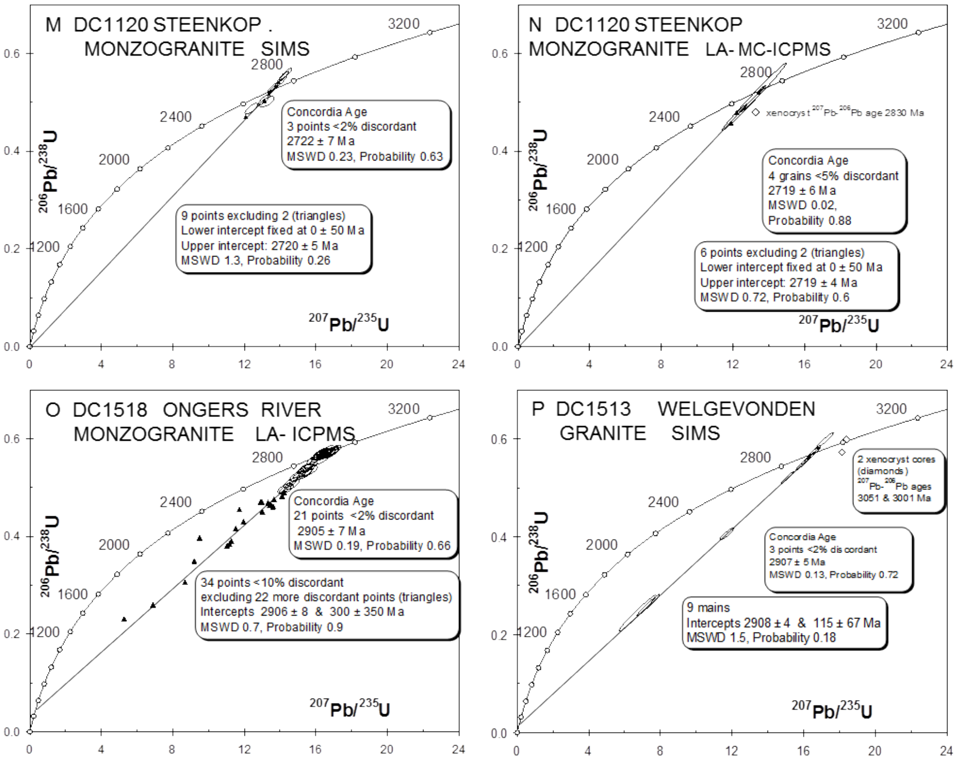


Fig. 8-2. Concordia diagrams showing the U-Pb zircon data and calculations for four samples from the Marydale High and two samples from further south, following Table 2. Error ellipses are all shown at 1σ but age calculations at the 2σ confidence level.



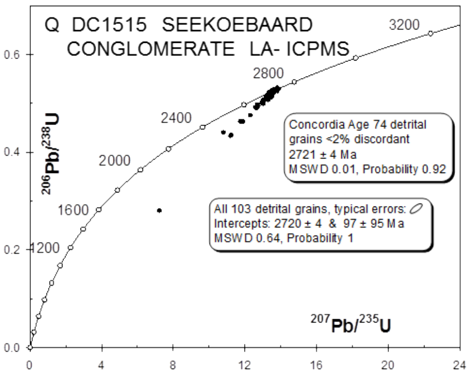


Fig. 8-3. Concordia diagrams showing the U-Pb zircon data and calculations for four granitoid samples and a conglomerate from the Marydale High. Error ellipses are all shown at 1σ.

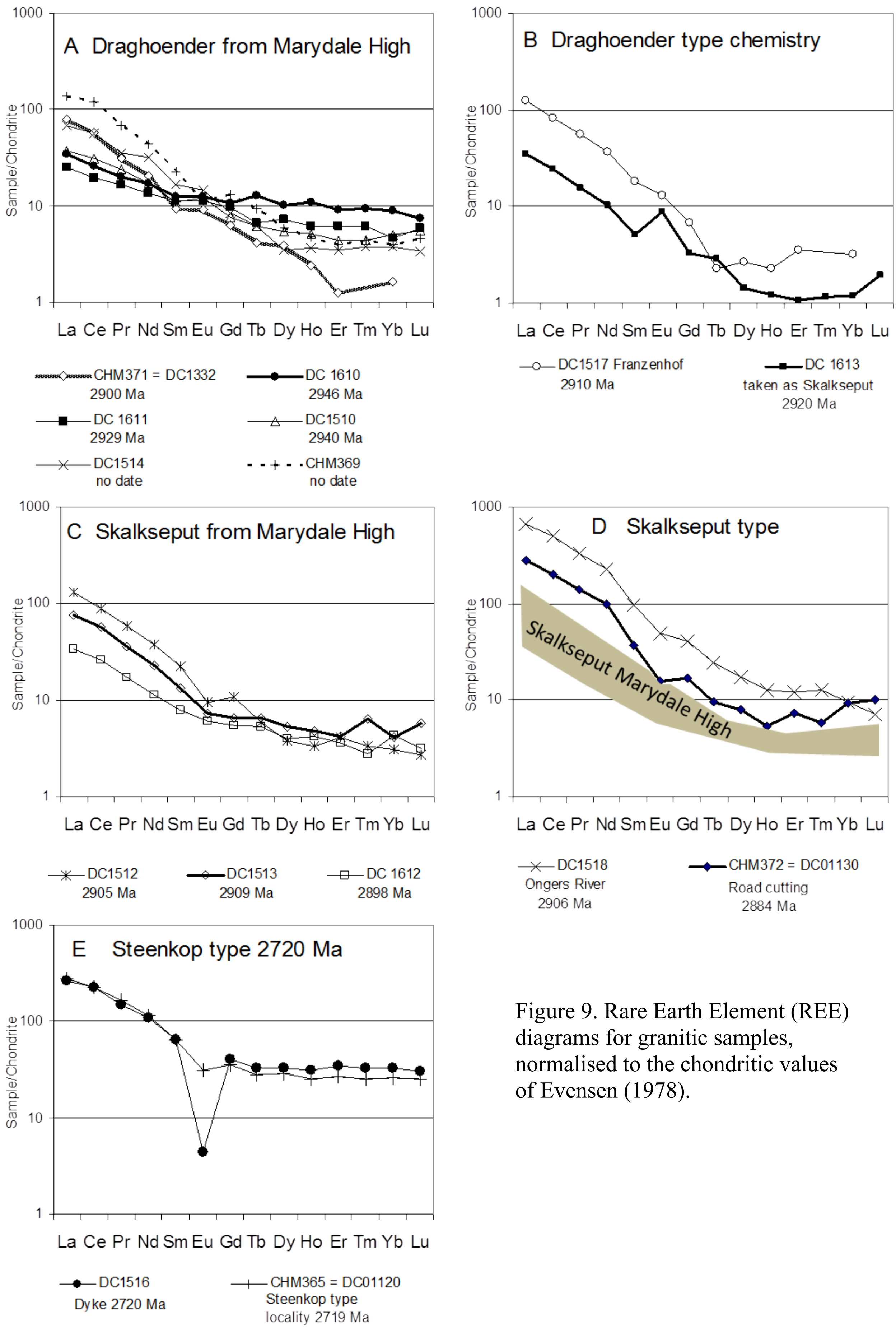


Figure 9. Rare Earth Element (REE) diagrams for granitic samples, normalised to the chondritic values of Evensen (1978).

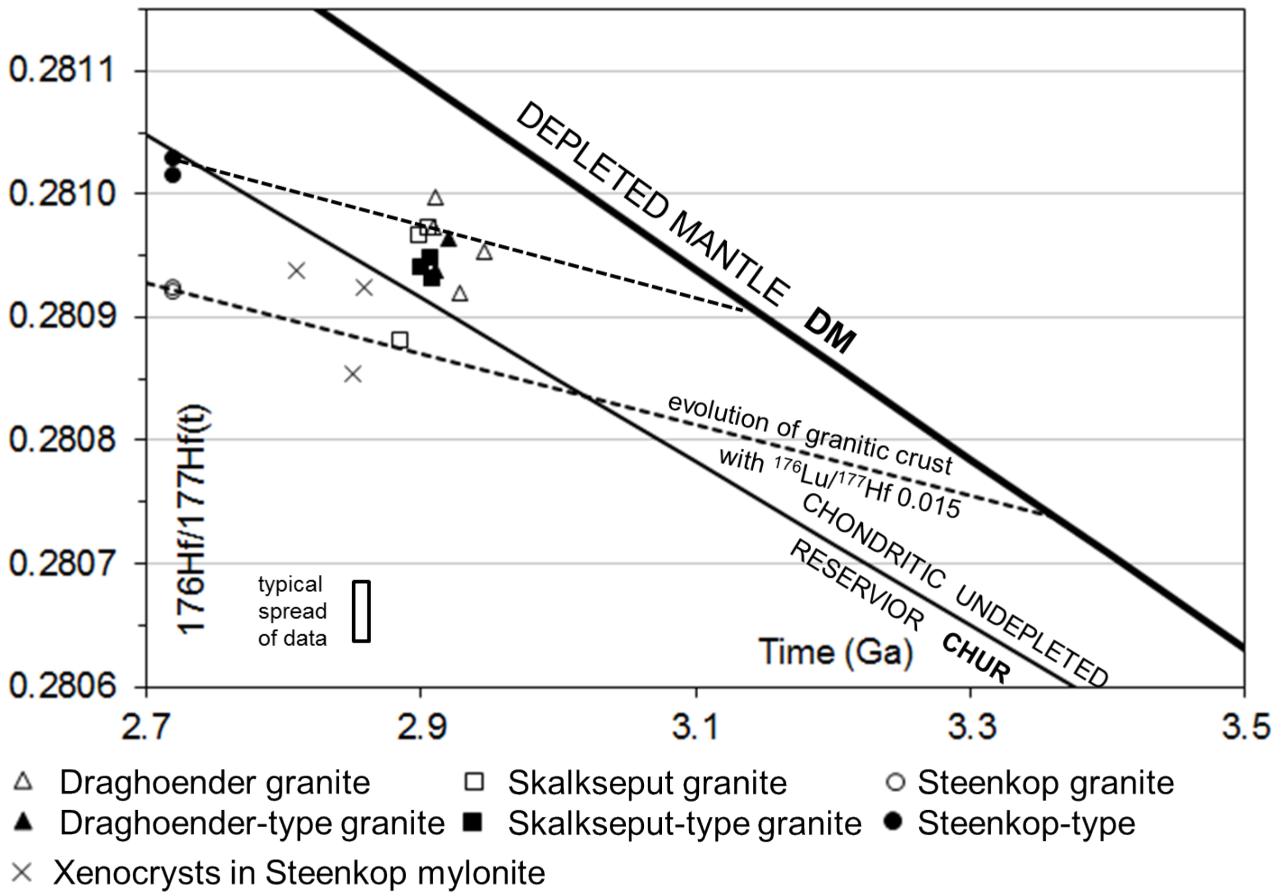


Figure 10. Zircon Lu-Hf data for 12 samples plotted on a Hf isotope evolution diagram. The data points are averages based on at least four Lu-Hf isotope analyses with typical spread ± 0.000035. The calculation of crustal residence ages for a sample is illustrated by projecting an evolution line corresponding to a hypothetical granitic precursor with $^{176}Lu/^{177}Hf$ 0.015 from the data point back to intersect with the Depleted Mantle line, in this case at 3.5 Ga. More mafic precursors with e.g. $^{176}Lu/^{177}Hf$ 0.022 would give older crustal residence ages.

There are clearly two groups (excluding for the moment the younger Steenkop type) and only Vajner's (1974a) Draghoender sample plots between them. According to this grouping, one sample DC1613, taken as Skalkseputs plots in the Draghoender group, whereas CHM369 taken as Draghoender, plots in the Skalkseput group. To test whether the geochemical grouping is supported by the geochronology, the ages of all the samples are plotted on a map in Figure 4, and shown in order of latitude in Figure 11, in which e.g. S- D indicates taken as Skalkseput, grouped as Draghoender.

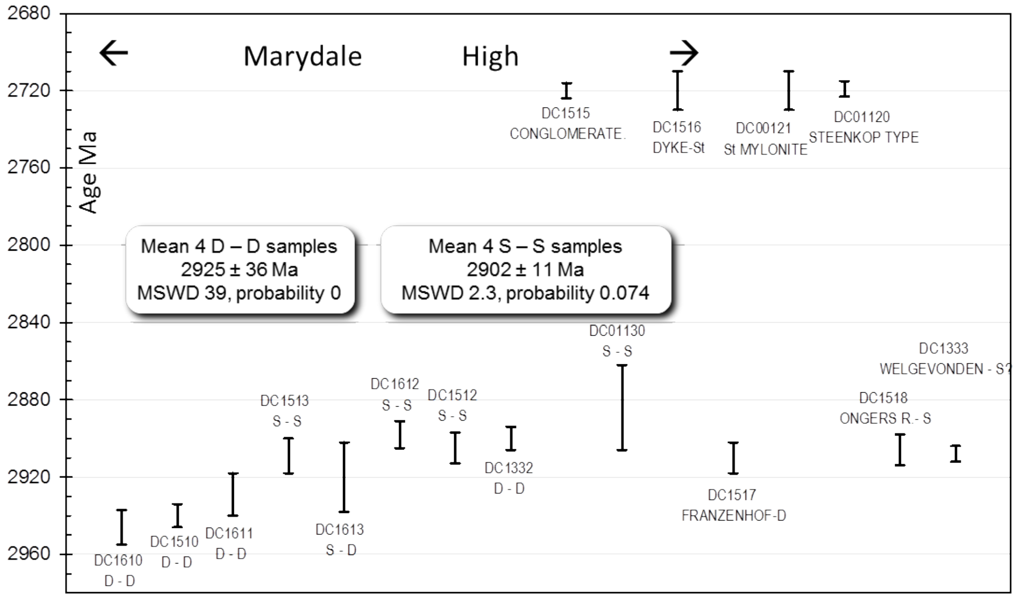


Figure 11. Precise U-Pb zircon microbeam dates for granitic samples from the southwest margin of the Kaapvaal Craton arranged in order of latitude south. Sample numbers are followed by Taken As - Classified As. e.g D – S means taken as Draghoender, classified as Skalkseput type. St means Steenkop type.

The four Draghoender samples about which there is no doubt have ages between 2946 and 2900 Ma. They do not give a valid mean age and there seems to be a trend of decreasing age southwards. The easterly sample DC1613 with age 2920 ± 18 Ma, which was taken as Skalkseputs Granite but plots as Draghoender type, might represent a large xenolith or intrusive body different from the Skalkseputs Granite; however its field relations could not be determined in this area of poor outcrop. Tonalitic rocks of the Draghoender Granite type clearly intruded over a period of about 40 Ma and were not comagmatic but probably originated by similar magmatic processes.

Four unequivocally Skalkseput samples give a mean age of 2902 ± 11 Ma with low probability which could be valid if the errors were increased. Sample CHM369, taken as Draghoender but plotting geochemically with Skalkseput, was not dated. To summarise, the emplacement of the Draghoender Granite type took place over a long period between 2946 and 2900 Ma. The Skalkseputs Granite might represent a single magmatic event at 2902 Ma, which overlapped in time with the emplacement of the younger members of the Draghoender type.

6.2 The Steenkop type

The Steenkop Granite Gneiss is about 200 Ma younger than the other granites with a weighted mean age of 2719 ± 3 Ma on three analyses of two samples including a mylonised sample DC00121 from the Doornberg Fault. The distinctive gneiss with large biotite flecks has a rather restricted outcrop, but the dyke (sample DC1516) which intrudes Skalkseput Granite in the Marydale High has an indistinguishable age of 2720 ± 10 Ma, although it is a much lighter colour. This is also the age reported by McCourt et al., (2000) for the Skalkseput Granite dated by Richard Armstrong. Failing any input from the latter, we think that he dated the same unit as the dyke, which they possibly thought represented the Skalkseput Granite intruding Draghoender Granite. The Steenkop Granite sample and the dyke sample plot close to each other in Figures 5 and 6, suggesting that they are related.

6.3 The Seekoebaard conglomerate.

This sample DC1515 has a single age population comprising two zircon types, CL-dark and CL-bright. The concordia age of 2720 ±4 Ma for these zircons shows that the conglomerate is not a xenolith in the older granites, but most likely a basal member of the Zeekoebaard Formation, which has not been dated but is considered part of the Ventersdorp Supergroup.

6.4 Geochemical Distinctions

The validity of the normative distinctions of the two granite types was further tested. Diagrams involving Na, K, Ca and Sr all show the same grouping, the Draghoender type having lower potassium (0.7 - 1.8 compared with 3.6 – 4.9 K_2O wt%) and higher Na and Sr as shown in Figure 6. The two Steenkop-type samples are again clearly distinct with much lower Na_2O and low Sr.

The Maritzdam Granite sample DC1518, which is coeval with and classified as Skalkseputs type, has much higher Sr content than the other samples in that group, suggesting a different magmatic evolution.

Rare Earth Element (REE) diagrams are shown in Figure 9. Both Draghoender and Skalkseput groups show significant diversity but the groups are not clearly distinguished by REE geochemistry. The samples all show moderate to high Light REE enrichment and two

Draghoender type Trondhjemitic samples DC1332 and DC1613 show significant heavy REE depletion to near-chondritic levels, which suggests that garnet was present in the (probably mafic) protolith which melted to form these magmas. High-pressure, plagioclase-absent melting processes for most samples are also suggested by the small to non-existent Eu anomalies which both types show. The slope patterns of all the Skalkseputs group samples are similar, suggesting that they could be related by crystal fractionation which would generally increase the concentrations without changing the slopes. By contrast the Draghoender group samples have significantly different slope patterns and are unlikely to have been comagmatic, which is also indicated by their 40 Ma range of zircon dates.

Lu-Hf data for zircons can be used to calculate crustal residence ages as shown in Figure 10, which throw light on the crustal history of the area, although assumptions about the Depleted Mantle source and Lu-Hf ratio of crustal protoliths are difficult to test. A granitic crustal protolith with $^{176}Lu/^{177}Hf$ 0.015 gives the probable minimum crustal residence ages shown in Figure 12 plotted against intrusion ages. Assuming basaltic crustal protolith with $^{176}Lu/^{177}Hf$ 0.022 gives typically 200 Ma older crustal residence ages which may be valid for the Draghoender type samples, thought to be generated by melting of eclogitic mafic crust in a subduction setting. The Draghoender Figure 12 allows discussion of the origin of the samples investigated. All but one of the Draghoender and Skalkseput (including type) samples have similar crustal residence ages between 3.25 and 3.1 Ga, suggesting that they might have similar crustal histories. The data also shows that the more evolved (potassic) Skalkseput samples could have originated by melting of the plagioclase-rich Draghoender-like material soon after it had formed. However as mentioned above, the tonalitic and trondhjemitic Draghoender samples are more likely to have had mafic crustal protoliths which would increase their crustal residence ages by about 0.2Ga, but not invalidate the suggestion above. The exception is one Skalkseput sample DC01130 with crustal residence age at 3.35 Ga, which suggests derivation from a different protolith.

The two Steenkop Granite samples have 0.2 Ga older crustal residence ages than the two Steenkop-type samples which are the dyke DC1516 and the nearby conglomerate DC1515, grouped with Steenkop because of their indistinguishable U-Pb ages and the similar geochemistry of the dyke sample. One way in which their crustal histories can be reconciled is if the Steenkop Granite samples were derived from a 3.4 Ga granitic protolith whereas the Steenkop-type samples represent melted mafic crustal protolith of the same 3.4 Ga age. This could be the case in view of the bimodal nature of the Ventersdorp Supergroup, with basaltic, andesitic and felsic units. Alternatively they were derived from protoliths which left the mantle at different times.

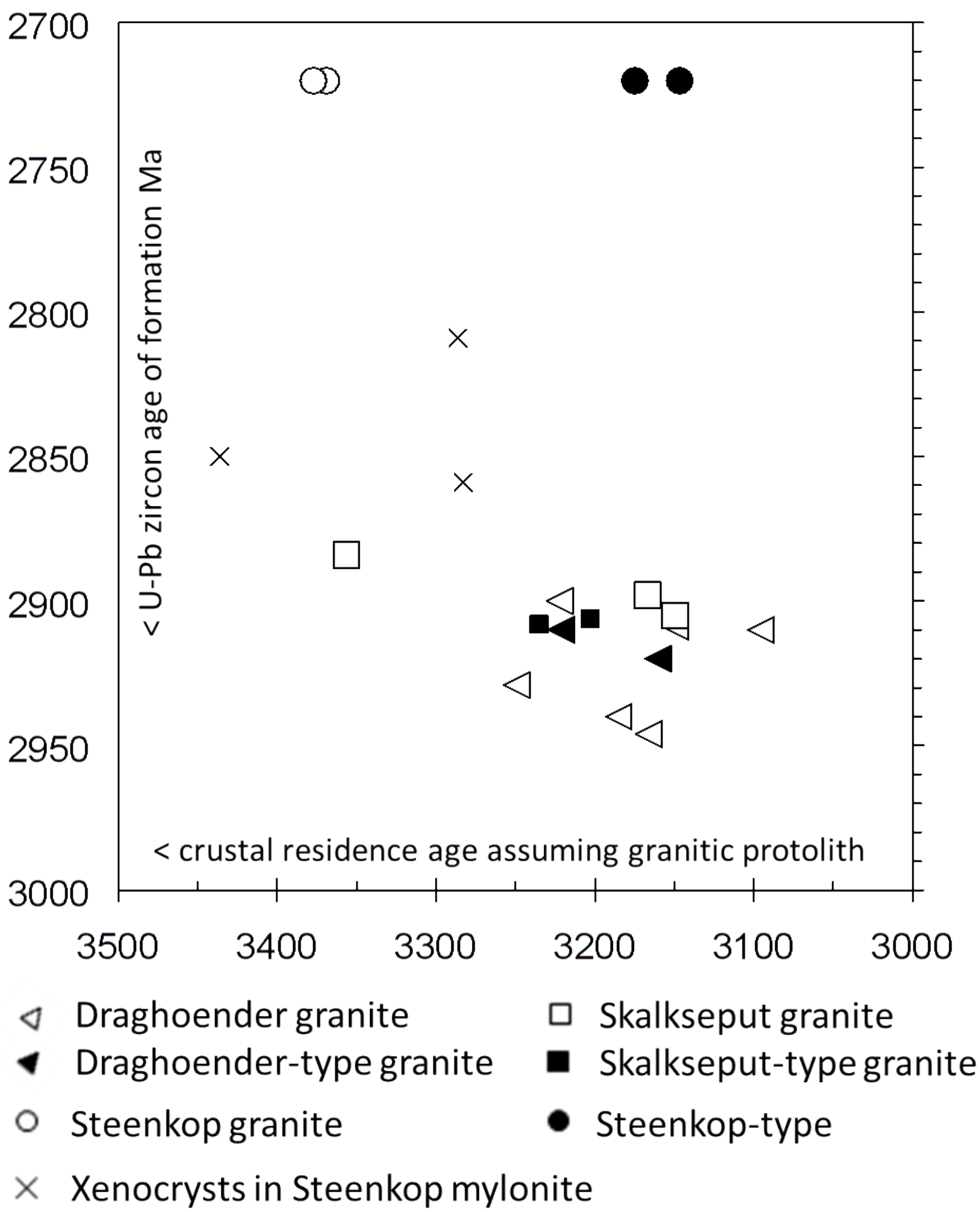


Figure 12. U-Pb zircon ages plotted against crustal residence ages assuming that the zircon originated from a magma which formed by melting of a granitic crustal protolith with ^{176}Lu/^{177}Hf 0.015.

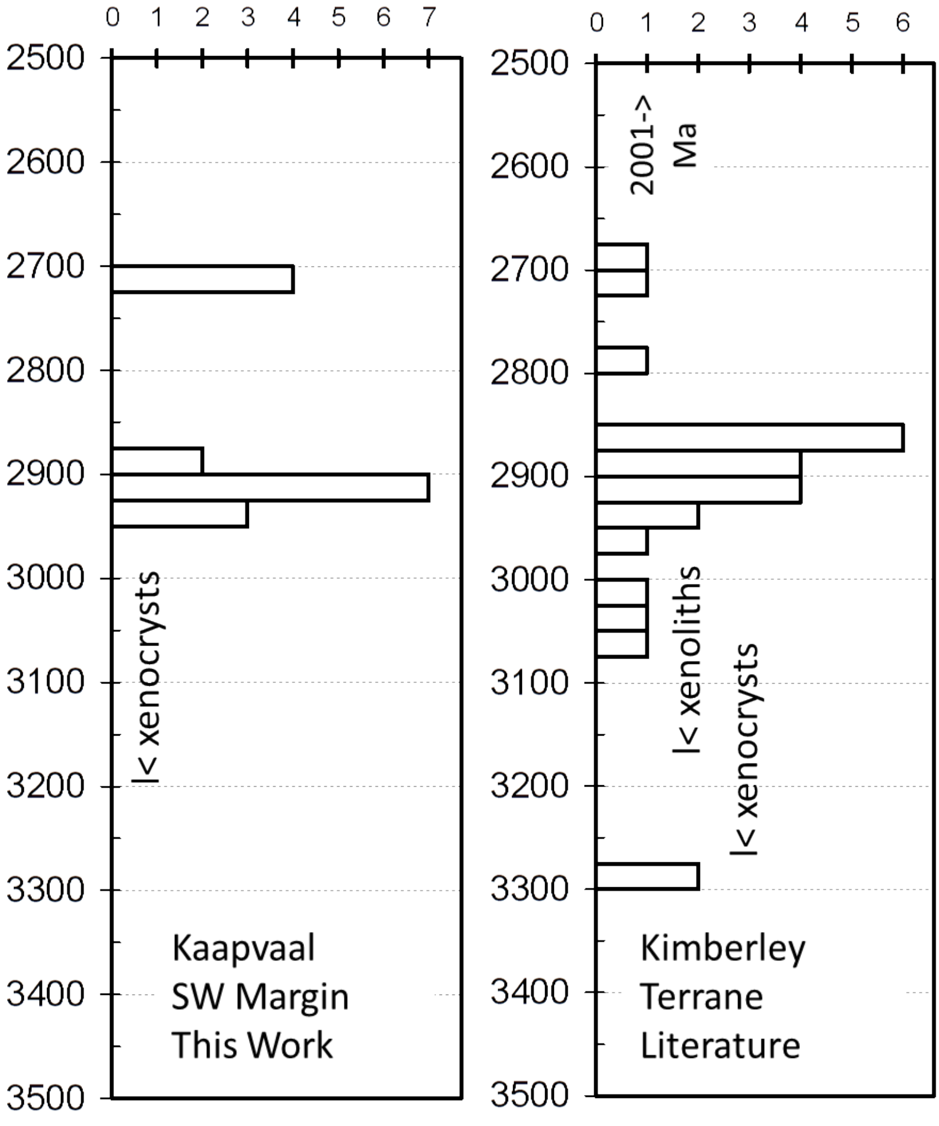


Figure 13. Comparison of precise ages for granitoids of the southwestern margin of the Kaapvaal Craton reported in this work with those from the literature for the Kimberley Terrane.

6.5 Regional implications.

As shown in Figure 13, the age distribution found in this work corresponds to a large extent with that for the Kimberley Terrane (equivalent to Block) of the Kaapvaal Craton extracted from the Dateview database, described by Eglington, and Armstrong (2004) and summarized in appendix A4. Granitic basement as old as 3280 Ma in the Kimberley mines and granitic kimberlite xenoliths reflect the earliest well-documented crustal development in the terrane. Our smaller dataset yielded xenocrysts as old as 3180 Ma in the Draghoender Granite and even earlier crustal development is suggested by our Lu-Hf zircon crustal residence ages of 3050 to 3450 Ma, shown in Figure 12. The main peak of emplacement ages between about 2950 and 2850 Ma is thought to correspond to a subduction event followed by accretion of the Kimberley terrane to the greater Kaapvaal Craton (Schmitz et al., 2004). The ~2700 Ma event seen in both datasets can be ascribed to granitic magmatism related to the Ventersdorp volcanism.

6.6 Identity of the Marydale Terrane

The rocks dated in this work clearly originated as part of the Archean Kimberley Terrane before becoming part of the greater Kaapvaal Craton. However their major uplift along the Doornberg Lineament, deformation and low-grade metamorphism, means that they are no longer part of the craton *sensu stricto* but should rather be regarded as part of the Marydale Terrane (Thomas et al., 1994, Hilliard, 1999). Weckmann et al., 2010 showed that high crustal resistivity characteristic of the Kaapvaal Craton continues far into the Namaqua-Natal Province in a profile southwest of Prieska. Their proposal that the craton boundary should be moved some 50 km south-westwards into the Namaqua-Natal Province may be interesting to diamond prospectors, but does not meet the requirement that a craton should be undeformed after its origin. It does seem possible that Kaapvaal cratonic basement could extend south-westwards beneath a major northeast-vergent thrust package which is exposed as the Marydale and Areachap terranes. Thus the cratonic limits may differ depending on the crustal level.

6.7 Significance of the Doornberg Fault

All but one of our samples, the Maritzdam Granite, lie within the Doornberg Lineament *sensu lato* of Vajner (1974b), which corresponds to our Marydale Terrane between the Doornberg Fault *sensu stricto* and the Brakbos Shear Zone (Figure. 2). The Kaapvaal supracrustal cover sequence comprising the Ventersdorp and Griqualand West Supergroups do not occur southwest of the Doornberg Fault *sensu stricto,* which is why the main fault is shown in Fig. 2 passing close to Marydale, contrary to Vajner (1974a) who shows it dying out into the Zeekoebaard volcanic rocks near Koegas. Our granite samples are from both sides of the fault and the question is whether they are all Kaapvaal basement granites. The Draghoender and Skalkseput Granite exposed in the Marydale High are clearly overlain by Kaapvaal supracrustals and are Kaapvaal basement. The 2906 ±8 Ma Maritzdam Granite (see Figures 1 and 11) occupies the same stratigraphic position northeast of the Doornberg Lineament and is geochemically similar to and the same age as the 2902 ±11 Ma Skalkseput granite samples, with which it should be correlated. The 2908 ±4 Ma Welgevonden Granite sample south of the Doornberg Fault was too weathered to be geochemically analysed, but is also regarded as a Skalkseput correlate. Further north, the 2910 ±8 Ma Franzenhof Granite corresponds geochemically to the Draghoender type and 2946 - 2900 Ma broad age range despite lying south of the Doornberg Fault. The third granite type exemplified by the younger 2719 ± 3 Ma Steenkop Granite, which crops out south of the Doornberg Fault is now known to have age correlates in the Marydale High in the form of 2720 ± 10 Ma dykes with similar geochemistry, as well as the conglomerate which contains only 2720 ± 4 Ma zircons of the same age and thought to represent the base of the Zeekoebaard Formation of the Ventersdorp Supergroup. Thus it seems that all three granite types straddle the Doornberg Fault which thus does not represent a major stratigraphic discontinuity.

Two questions remain. Why is the Kaapvaal supracrustal sequence absent south of the Doornberg Fault? Does the Marydale Group which (probably tectonically) overlies the Welgevonden and Franzenhof Granites represent a Ventersdorp correlate? These will be addressed in a later paper.

6.8 Crustal development of the Kimberley Terrane

A possible scenario for the development of the Kimberley Terrane is as follows.

1. Crustal development began with mafic magmatism producing basaltic or komatiitic crust in a setting similar to a Phanerozoic mid-ocean ridge. Our zircon Lu-Hf crustal residence ages give clues to the timing of this event, which was before 3.2 Ga, assuming granitic crustal protoliths (Figure 12, or as early as 3.9 Ga, if a mafic protolith is assumed which seems likely for the trondhjemitic rocks.

2. Granitic rocks formed as early as 3280 Ma in the Kimberley Mines area according to xenolith and xenocryst data from Kimberley (Dateview database described by Eglington, and Armstrong 2004). In the Marydale High felsic rocks containing zircon but otherwise of unknown composition formed as early as 3180 Ma evidenced by xenocrysts found in our samples.

3. Subduction of oceanic crust beneath the proto-Kimberley Terrane led to the formation of eclogites at depths around 30 km, melting of which gave rise to granitoid magmas which were emplaced between about 2950 Ma and 2890 Ma as plagioclase-rich trondjhemites and

tonalites of Draghoender type in the Marydale High area. This process gave rise to the bulk of the granitic crust in the Kimberley Terrane.

4. Collision of the Kimberley Terrane with the Witwatersrand Terrane (Schmitz et al., 2004) led to remelting of the tonalitic granitoids to produce K-rich granites of the Skalkseputs type at about 2915 – 2885 Ma, and resulted in the formation of a large craton of which the present Kaapvaal Craton was a part.

5. A further thermal event originating in the mantle at about 2720 gave rise to huge basaltic intrusions into the lower crust and after some crustal mixing, resulted in extrusions of andesitic and felsic Ventersdorp lava over the entire Kaapvaal Craton, including the Zeekoebaard lavas exposed in the Marydale High. Remelting of lower crustal granitoids during this process also gave rise to granitic intrusions emplaced as the Steenkop type.

7. Conclusions

1. Three granitoid types, which crop out along the southwestern margin of the Kaapvaal Craton, have been identified using geochemistry and microbeam zirconology.

2. The Draghoender type is tonalitic to trondhjemitic in composition and ranges in age from 2946 ±9 Ma to 2900 ±6 Ma (n=6). It does not represent a single magma but is thought to have been produced by melting of mafic crust at eclogite-facies depths during a subduction event.

3. The Skalkseputs type (n=6) is granodioritic to quartz monzonitic, contains much more (normative) alkali feldspar than the Draghoender type and has a weighted mean age of 2902 ±11 Ma, suggesting that the Skalkseputs intrusions may represent a single magmatic event. It is thought to correspond to the collision of the Kimberley Terrane with the Witwatersrand Terrane.

4. The Steenkop Granite is monzogranitic and is about 200 Ma younger than the other types, dated at 2719 ±3 Ma. It lies athwart the Doornberg Fault which gave rise to mylonitic fabric in one sample. It is geochemically similar to and coeval with 2720 ±10 Ma dykes which intrude the Skalkseput Granite in the Marydale High (Steenkop type n=3). A nearby conglomerate with a single 2720 ±4 Ma detrital zircon population is considered to be a basal unit of the andesitic Zeekoebaard Formation. The Steenkop type is thus probably an intrusive equivalent of the ~2720 Ma volcanic Ventersdorp Supergroup.

5. All but one of the samples studied lie within the 35 km-wide Marydale Terrane, bounded by the Doornberg Fault and Brakbos Shear Zone, which is transitional between the undeformed Kaapvaal Craton and the ~1.2 Ga tectonometamorphic Areachap Terrane of the Namaqua-Natal Province. The granite samples we studied lie athwart the Doornberg Fault but

are all considered to have originated as part of the Kimberley Terrane basement which amalgamated with the Kaapvaal Craton at about 2900 Ma. The supracrustal rocks in the Marydale Terrane which overlie the granites are a northeast-vergent fold and thrust package, evidenced by their discontinuous stratigraphy and increasing metamorphic grade upwards in the stratigraphic sequence.

8. Acknowledgements

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Twelve of the samples were geochemically analysed by M. Crowley at the Council for Geoscience, Pretoria, the rest were analysed by Riana Rossouw at the Central Analytical Facility, University of Stellenbosch.

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Captions for Figures

Figure 1. Precambrian structural provinces of southern Africa showing the locality of the study area (Figure. 2) at the southwestern margin of the Kaapvaal Craton. Selected precise U-Pb ages of other granitoids in the basement of the Kimberley block are shown.

Figure 2. Geological map showing the granites exposed on the southwestern margin of the Kaapvaal Craton. The Marydale Terrane lies between the Doornberg Fault and Brakbos Shear Zone. The Marydale High is the area underlain by the Draghoender and Skalkseput Granites between Marydale and Koegas. Sample localities south of the Marydale High are indicated as follows. Fr: Franzenhof Granite DC1517; St: Steenkop Granite Gneiss DC00121 from Steenkop; St my: Mylonitised Steenkop Granite DC01120 from Prieskapoort; Wel: Welgevonden Granite DC1333; Maritzdam Granite from the Kuip window of basement granite overlain by Ventersdorp Supergroup volcanic rocks.

Figure 3. Field pictures of samples taken in this work.

Figure 4. Precise U-Pb zircon dates for Kaapvaal basement granitoid samples exposed in the Marydale High, with localities marked by symbols Δ, ¤ and θ. Δ indicates Draghoender type tonalitic rocks with low QAP normative alkali feldspar (4-12%). ¤ indicates Skalkseput – type granodioritic rocks with higher QAP normative alkali feldspar (22-29%). θ indicates younger (2720 Ma) monzo-granite dykes coeval with the Steenkop Granite exposed near Prieskapoort. The sample numbers corresponding to ages can be found in Table x. Samples for which norms but not dates are available are shown with sample numbers. The H 2853 Ma age shown is by ion probe for Draghoender Granite from Hilliard 1999 and the A 2718 Ma age shown is an ion probe age by Richard Armstrong for his Skalkseputs Granite, referred to in Hilliard 1999 and McCourt et al., 2000 and considered in this work to represent a Steenkop – aged dyke which we sampled at this locality. Precise locations for these two samples are not available. The dashed line is the Draghoender – Skalkseput boundary

according to the Council for Geoscience 1:250 000 Prieska map sheet of Malherbe and Moen 1991. Where it differs from that, the boundary according to Vajner 1974 is shown as a thin solid line.

Figure 5. Normative Quartz – Alkali feldspar – Plagioclase (QAP) mineral proportions for Granite samples from the southwestern margin of the Kaapvaal Craton including the Marydale high and outcrops southwards on both sides of the Doornberg Fault. Three types are distinguished as shown. The Draghoender and Skalkseput types overlap in U-Pb zircon age and the Steenkop type samples are significantly younger at ~2720 Ma.

Figure 6. Geochemical distinction of granite samples from the Southwestern Kaapvaal Craton. Three types are apparent, the Draghoender (triangles) and Skalkseputs (blocks) granites which overlap in age and the younger ~2720 Ma Steenkop type.

Figure 7 Tectonic discrimination diagram for granites.

Fig. 8-1. Concordia diagrams showing the U-Pb zircon data and calculations for six samples from the Marydale High, arranged in order of latitude south, following Table x. Error ellipses are all shown at 1σ but age calculations at the 2σ confidence level

Fig. 8-2. Concordia diagrams showing the U-Pb zircon data and calculations for four samples from the Marydale High and two samples from further south, following Table x. Error ellipses are all shown at 1σ but age calculations at the 2σ confidence level.

Fig. 8-3. Concordia diagrams showing the U-Pb zircon data and calculations for four Granitoid samples and a conglomerate from the Marydale High. Error ellipses are all shown at 1σ.

Figure 9. Rare Earth Element (REE) diagrams for granitic samples, normalised to the chondritic values of Evensen (1978).

Figure 10. Zircon Lu-Hf data for 12 samples plotted on a Hf isotope evolution diagram. The calculation of crustal residence ages for a sample is illustrated by projecting an evolution line corresponding to a hypothetical granitic precursur with 176Lu/177Hf 0.015 from the data point back to intersect with the Depleted Mantle line, in this case at 3.5 Ga. More mafic precursors with e.g. 176Lu/177Hf 0.022 would give older crustal residence ages.

Figure 11. Precise U-Pb zircon microbeam dates for granitic samples from the southwest margin of the Kaapvaal Craton arranged in order of latitude south. Sample numbers are followed by Taken As - Classified As. e.g D – S means taken as Draghoender, classified as Skalkseput type. St means Steenkop type.

Figure 12. U-Pb zircon ages plotted against crustal residence ages assuming that the zircon originated from a magma which formed by melting of a granitic crustal protolith with ^{176}Lu/^{177}Hf 0.015.

Figure 13. comparison of precise ages for granitoids of the southwestern margin of the Kaapvaal Craton reported in this work with those from the literature for the Kimberley Terrane.

Captions for Tables

Table 1. Major element analyses and normative data for granitoid samples from the Southwestern margin of the Kaapvaal Craton.

Table 2. Summary of U-Pb zircon dating results for granitoid from the southwestern margin of the Kaapvaal Craton. Methods abbreviations are: LA Laser Ablation; HR High Resolution; MC multicollector; ICPMS Inductively coupled Mass Spectrometry; SIMS secondary ion mass spectrometry.

Ancilliary Data appendices

A1 Full geochemical data.

A2 Microbeam U-Pb zircon data.

A3 Lu-Hf zircon data.

A4 U-Pb zircon age data for the Kimberley Terrane of the Kaapvaal Craton extracted from the Dateview database, described by Eglington, and Armstrong (2004).

Sample	DC1510	DC1512	DC1513	DC1514	DC1516	DC1517	DC1518	DC1519	DC1610	DC1611	DC1612	DC1613	CHM365	CHM369	CHM371	CHM372	2583	4425	4424
equivalent													**DC01120**		**DC1332**	**DC1130**			
Sample taken as	**Draghoender Granite**	**Skalkseput Granite glacial surface**	**Skalkseput Granite large outcrop**	**Draghoender Granite**	**Dyke in Skalkseput**	**Franzenhof Granite fluvoglacial surface**	**Maritzdam Granite at Kuip**	**Zeekoebaard pale green lava**	**Draghoender Granite**	**Draghoender Granite**	**Skalkseput Granite**	**Skalkseput Granite**	**Steenkop Granite (type locality)**	**Draghoender Granite**	**Draghoender Granite**	**Skalkseput Granite**	**Draghoender Granite from Vajner 1974**	**Skalkseput Granite from Vajner 1974**	**Skalkseput Granite from Vajner 1974**
Geochem type	**Draghoender**	**Skalkseput**	**Skalkseput**	**Draghoender**	**Steenkop**	**Draghoender**	**Skalkseput**	**Andesite**	**Draghoender**	**Draghoender**	**Skalkseput**	**Draghoender**	**Steenkop**	**Skalkseput**	**Draghoender**	**Skalkseput**	**between D&S**	**Skalkseput**	**Skalkseput**
Lat. °S	29.2444	29.3643	29.3042	29.3860	29.5159	29.6283	30.1425	29.3395	29.2364	29.3041	29.3288	29.3055	29.8110	29.31759	29.3857	29.5163	unknown	unknown	unknown
Lon. °E	22.0746	22.1443	22.1529	22.0853	22.3112	22.4341	23.2251	22.2875	22.0716	22.0904	22.2085	22.2247	22.6850	22.09434	22.1171	22.3109			
SiO2	70.11	74.14	74.24	72.36	75.93	73.05	70.08	55.27	70.67	69.05	75.24	75.93	74.27	74.49	72.34	71.24	73.14	71.00	77.91
TiO2	0.24	0.14	0.11	0.25	0.12	0.21	0.45	0.68	0.24	0.29	0.05	0.08	0.58	0.08	0.21	0.36	0.16	0.35	0.10
Al2O3	16.29	14.27	14.47	15.44	12.57	14.92	14.66	14.11	15.75	16.02	13.86	13.77	12.37	14.16	15.01	14.96	14.24	14.53	12.59
Fe2O3	2.27	1.68	1.28	2.20	1.73	1.73	3.04	10.05	1.99	2.04	0.51	0.67	3.17	1.36	2.13	2.31	1.54	2.36	0.67
MnO	0.035	0.027	0.033	0.028	0.020	0.042	0.040	0.195	0.040	0.020	0.010	0.020	0.045	0.021	0.033	0.034	0.02	0.03	0.01
MgO	0.57	0.14	0.03	0.32	<0.01	0.40	0.67	4.41	0.040	0.02	0.01	0.02	0.30	0.01	0.38	0.46	0.31	0.62	0.33
CaO	3.06	1.17	0.78	2.77	0.39	1.82	1.34	7.09	0.58	0.72	0.07	0.24	1.40	0.81	2.31	1.49	1.43	1.67	0.52
Na2O	5.42	4.41	4.70	5.56	3.34	5.02	3.87	3.68	2.92	3.51	0.41	1.43	3.41	4.15	5.12	4.01	5.21	4.24	4.48
K2O	0.99	3.60	3.70	0.72	5.24	1.84	4.88	1.17	5.29	5.66	4.64	5.49	4.15	4.69	1.49	4.54	3.12	4.10	3.77
P2O5	0.094	0.054	0.057	0.111	0.036	0.120	0.227	0.139	0.980	0.950	4.070	1.060	0.148	0.029	0.099	0.144	0.080	0.120	0.050
Cr2O3	0.007	0.005	0.006	0.006	0.004	0.007	0.005	0.024	0.090	0.110	0.100	0.020	0.007	0.007	0.005	0.005	0.015	0.010	0.010
LOI	0.87	0.33	0.42	0.58	0.30	0.88	0.71	2.99	1.08	1.04	0.55	0.67	0.22	0.29	0.57	0.47	0.66	0.68	0.40
Total	99.97	99.97	99.82	100.35	99.56	100.05	99.97	99.81	99.63	99.41	99.51	99.38	100.06	100.11	99.69	100.03	99.92	99.70	100.84
CIPW-normative minerals wt%																			
Quartz	26.9	31.51	30.84	30.33	35.12	32.16	24.58	6.74	28.8	24.04	32.11	36.8	34.41	30.13	30.9	26.26	27.17	25.76	35.54
Plagioclase	61.1	42.96	43.55	60.29	30.24	51.25	38.33	51.72	59.67	64.52	41.07	54.11	34.95	39.11	54.79	40.63	50.8	43.9	39.99
Orthoclase	5.91	21.39	21.98	4.25	31.2	10.99	29.13	7.21	5.91	5.73	24.29	6.32	24.64	27.78	8.92	27.01	18.62	24.52	22.22
Corundum	0.98	1.13	1.47	0.76	0.78	1.65	1.11	0	0.89	0	1.34	1.07	0.08	0.86	0.99	1.09	0	0.37	0.31
Diopside	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.5	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0	0
Hypersthene	3.77	2.12	1.42	3	1.85	2.77	4.58	16.06	3.5	3.27	0.71	1.29	3.56	1.51	3.15	3.32	2.21	3.81	1.45
Ilmenite	0.46	0.28	0.21	0.47	0.23	0.4	0.85	1.35	0.46	0.57	0.09	0.15	1.1	0.15	0.4	0.68	0.3	0.66	0.19
Magnetite	0.67	0.49	0.38	0.64	0.51	0.51	0.88	3.03	0.58	0.61	0.14	0.20	0.93	0.39	0.62	0.67	0.45	0.7	0.19
Apatite	0.23	0.12	0.14	0.25	0.09	0.28	0.53	0.35	0.21	0.25	0.23	0.05	0.35	0.07	0.23	0.32	0.19	0.28	0.12
rock type	Tonalite	Granodiorite	Granodiorite	Tonalite	Monzogranite	Granodiorite	Monzogranite	Andesite	Tonalite	Tonalite	Monzogranite	Granodiorite	Monzogranite	Monzogranite	Granodiorite	Monzogranite	Granodiorite	Monzogranite	Monzogranite
Q% in QAP	29	33	32	32	36	34	27	10	31	25	33	38	37	31	33	28	28	27	36
A%	6	22	23	4	32	12	32	11	6	6	25	7	26	29	9	29	19	26	23
P%	65	45	45	64	31	54	42	79	63	68	42	56	37	40	58	43	53	47	41

trace elements ppm																				trace elements ppm
	DC1510	DC1512	DC1513	DC1514	DC1516	DC1517	DC1518	DC1519	DC 1610	DC 1611	DC 1612	DC 1613	CHM365	CHM369	CHM371 DC13	CHM372 DC0113(	2583	4424	4425	
Sc	7.30	6.85	6.65	6.03	6.57	6.45	7.11	29.80	7.01	6.48	4.48	4.05	10.86	6.53	6.00	7.50				Sc
V	29.65	12.3	8	20.75	5.3	26.50	40.35	182.75	24.93	35.24	9.19	10.47	33.7	7.85	22.40	29.85				V
Cr	17.70	13.05	11.65	9.55	77.6	13.45	23.95	134.20	12.90	17.22	9.39	9.77	13.4	12.40	21.85	22.40				Cr
Co	4.99	3.065	3.48	7.72	2.99	7.60	5.17	42.60	122.05	110.93	140.22	147.59	4.24	1.46	3.97	5.15				Co
Ni	22.25	16.55	25.7	19.85	577.50	18.10	14	100.75	13.64	16.52	10.75	16.72	11.25	16.90	19.30	14.40				Ni
Cu	28.85	51.75	20.15	29.35	41.20	24.00	21.05	127.75	101.71	33.66	6.43	19.33	27.25	20.55	35.45	39.10				Cu
Zn	43.40	60.5	64.5	109.50	71.85	70.50	58.5	20.25	37.95	22.27	18.66	40.09	58.15	38.85	39.90	68.00				Zn
Rb	30.10	119.2	200.5	19.65	258.00	138.40	113.9	279.50	25.92	23.71	207.02	61.30	119.30	157.85	46.80	196.50	108.00	128.0	185.00	Rb
Sr	531.50	211.5	166.5	474.00	27.20	434.00	578.0	18.55	495.75	534.28	104.35	304.39	147.10	171.45	434.50	191.95	255.00	104.0	218.00	Sr
Y	7.02	5.64	7.48	4.96	52.00	4.59	20.45	118.75	15.46	9.48	6.28	2.10	37.95	6.58	3.97	11.95	10.50	7.00	17.00	Y
Zr	186.50	113.8	71.55	164.00	262.50	130.95	260.55	6.38	158.09	182.60	52.07	72.27	471.50	103.80	127.00	270.15	163.00	64	286.00	Zr
Nb	4.71	5.93	17.45	12.52	25.10	12.70	18.15	0.91	21.41	4.41	13.67	5.74	20.65	17.30	11.26	17.75	5.20	12.00	10.10	Nb
Cs	0.61	1.325	2.745	0.52	1.18	2.07	0.96	0.19	0.39	0.39	3.08	1.62	1.96	1.23	0.67	1.39				Cs
Ba	352.00	751.00	596.00	234.00	201.50	403.50	1673.00	456.50	390.75	361.27	395.25	181.27	1056.50	1146.00	779.00	996.00	859.00	689.00	1104.00	Ba
La	9.22	31.9	18.55	16.63	64.35	30.35	160.55	20.92	8.42	6.14	8.17	8.58	68.15	33.30	19.55	68.65				La
Ce	19.80	56.35	36.65	35.85	143.75	52.70	319.55	41.80	16.60	12.52	16.62	15.47	145.05	76.75	36.90	126.55				Ce
Pr	2.34	5.61	3.415	3.45	14.52	5.39	31.25	4.82	1.93	1.62	1.65	1.52	15.78	6.51	2.97	13.46				Pr
Nd	8.05	17.85	10.75	15.00	51.55	17.55	108.15	19.60	8.10	6.49	5.38	4.93	54.30	20.50	9.85	46.45				Nd
Sm	1.72	3.45	2.03	2.54	10.10	2.80	14.9	3.97	1.93	1.75	1.20	0.80	10.05	3.51	1.45	5.70				Sm
Eu	0.71	0.55	0.425	0.84	0.26	0.76	2.83	1.04	0.72	0.66	0.35	0.52	1.81	0.65	0.54	0.92				Eu
Gd	1.58	2.17	1.35	1.74	8.22	1.41	8.3	3.34	2.19	1.95	1.10	0.68	7.18	2.68	1.30	3.45				Gd
Tb	0.23	0.221	0.2465	0.23	1.22	0.09	0.91	0.54	0.48	0.25	0.20	0.11	1.06	0.36	0.16	0.36				Tb
Dy	1.40	0.955	1.34	0.88	8.45	0.68	4.435	3.81	2.58	1.82	1.00	0.37	7.39	1.48	1.00	2.05				Dy
Ho	0.29	0.187	0.2715	0.21	1.77	0.13	0.724	0.68	0.63	0.35	0.24	0.07	1.46	0.27	0.14	0.31				Ho
Er	0.74	0.685	0.69	0.58	5.78	0.60	2.03	1.98	1.54	1.03	0.59	0.18	4.44	0.66	0.21	1.23				Er
Tm	0.11	0.084	0.161	0.10	0.83	#N/A	0.324	0.32	0.24	0.16	0.07	0.03	0.64	0.11	#N/A	0.15	BDL			Tm
Yb	0.83	0.5	0.675	0.63	5.36	0.53	1.57	2.11	1.48	0.77	0.72	0.20	4.30	0.65	0.27	1.56				Yb
Lu	0.14	0.068	0.1455	0.09	0.78	#N/A	0.1805	0.32	0.19	0.15	0.08	0.05	0.65	0.12	#N/A	0.26				Lu
Hf	3.98	2.765	2.565	3.88	8.49	2.55	5.855	3.05	3.53	4.23	1.71	2.26	11.46	3.98	3.28	6.56				Hf
Ta	0.21	0.1205	0.685	0.12	1.54	0.33	1.1	0.33	0.35	0.30	1.01	0.30	1.13	0.20	0.21	0.42				Ta
Pb	6.10	22.55	20.4	7.69	35.20	14.85	33.4	34.30	5.23	4.57	15.91	7.99	22.70	28.15	9.96	15.35				Pb
Th	1.27	10.03	6.47	2.71	14.76	4.07	28.90	3.10	1.57	1.12	4.78	4.79	10.09	15.59	5.42	10.96				Th
U	0.45	0.95	3.03	0.42	2.29	1.14	1.80	0.87	0.28	0.58	1.53	1.42	1.26	2.52	0.80	1.18				U
	DC1510	DC1512	DC1513	DC1514	DC1516	DC1517	DC1518	DC1519	DC 1610	DC 1611	DC 1612	DC 1613	CHM365	CHM369	CHM371 DC13	CHM372 DC0113(	2583	4424	4425	

#N/A: below detection limit

Sample	Unit	U-Pb microbeam dating method	
DC01120	Steenkop Granite Gneiss	discordia SIMS	
DC01120	Steenkop Granite Gneiss	discordia LA MCICPMS	
DC01121	Steenkop Granite Mylonite	Pb-Pb age LA MCICPMS	
DC01130	Skalkseput Granite	discordia LA MCICPMS	
DC1332	Draghoender Granite	discordia SIMS	
DC1333	Welgevonden Granite	discordia SIMS	
DC1510	Draghoender Granite	discordia LA HR ICPMS	
DC1512	Skalkseput Granite	discordia LA HR ICPMS	
DC1513	Skalkseput Granite	discordia LA HR ICPMS	
DC1515	conglomerate Zeekoebaard	discordia LA HR ICPMS	
DC1516	Dyke in Skalkseput	discordia LA HR ICPMS	
DC1517	Franzenhof Granite	discordia LA HR ICPMS	
DC1518	Ongers River Granite	concordia LA HR ICPMS	
DC1610	Draghoender Granite	discordia LA HR ICPMS	
DC1611	Draghoender Granite	discordia LA HR ICPMS	
DC1612	Skalkseput Granite	discordia LA HR ICPMS	
DC1613	Skalkseput Granite	discordia LA HR ICPMS	classified as Draghoender type

	Lat.S deg	S Min	Lon.E deg	E Min
	29	48.628	22	41.26

NORDSIM **DC01120 Steenkop Granite Gneiss** **7/12/03** Analysed by DHC

Puck DHC0301 n1357

Sample/ spot #	Age Domain	common Pb corrected $^{207}Pb/^{206}Pb$	±σ %	$^{207}Pb/^{235}U$	±σ %	$^{206}Pb/^{238}U$	±σ %	rho	$^{208}Pb/^{232}Th$	±σ %	Disc. % conv.	Disc. % 2σ lim.	uncorrected for common Pb $^{238}U/^{206}Pb$	±σ %	$^{207}Pb/^{206}Pb$	±σ %	Ages Ma $^{207}Pb/^{206}Pb$	±σ	$^{207}Pb/^{235}U$	±σ	$^{206}Pb/^{238}U$	±σ	$^{208}Pb/^{232}Th$	±σ	[U] ppm	[Th] ppm	[Pb] ppm	Th/U meas	$^{206}Pb/^{204}Pb$ measured	f_{206}%
1a	Main	0.18624	0.48	14.1636	1.48	0.55157	1.40	0.95	0.14497	3.27	5.6	2.0	1.811	1.40	0.18682	0.47	2709	8	2761	14	2832	32	2736	84	115	89	88	0.777	20862	0.09
4a*	Main	0.18628	0.25	12.0740	1.39	0.47009	1.37	0.98	0.12796	3.20	-10.0	-7.4	2.121	1.37	0.18816	0.24	2710	4	2610	13	2484	28	2434	73	561	307	352	0.547	6479	0.29
6a	Main	0.18783	0.58	14.0359	1.50	0.54198	1.39	0.92	0.14164	3.22	3.1		1.845	1.39	0.18795	0.58	2723	10	2752	14	2792	31	2677	81	166	217	137	1.308	100944	* 0.02
8a	Main	0.18693	0.35	13.6239	1.42	0.52859	1.38	0.97	0.14067	3.25	0.9		1.891	1.38	0.18734	0.35	2715	6	2724	14	2736	31	2660	81	300	140	208	0.468	29294	0.06
9a	Main	0.19180	1.53	13.2548	2.10	0.50121	1.43	0.68	0.13317	3.86	-6.1		1.989	1.43	0.19380	1.47	2758	25	2698	20	2619	31	2527	92	14	19	11	1.386	6022	* 0.31
15a	Main	0.18820	0.26	13.6042	1.40	0.52427	1.38	0.98	0.14107	3.18	-0.4		1.906	1.38	0.18856	0.26	2726	4	2723	13	2717	31	2667	80	420	402	319	0.958	33527	0.06
27a*	Main	0.18935	0.52	13.1176	1.47	0.50244	1.38	0.94	0.13198	3.35	-5.0	-1.7	1.989	1.38	0.18990	0.51	2737	8	2688	14	2624	30	2506	79	182	104	123	0.572	22063	0.08
29a	Main	0.18458	1.18	12.3989	1.87	0.48719	1.46	0.78	0.12999	3.78	-6.1	-0.7	2.027	1.46	0.19254	0.97	2694	19	2635	18	2559	31	2470	88	32	44	24	1.382	1530	1.22
67a	Main	0.18666	0.86	13.6487	1.71	0.53031	1.48	0.87	0.13911	3.47	1.3		1.883	1.48	0.18763	0.85	2713	14	2726	16	2743	33	2633	86	189	198	147	1.044	12503	0.15
68a	Main	0.18795	0.86	13.0970	1.79	0.50539	1.57	0.88	0.13452	3.64	-3.9		1.973	1.57	0.18997	0.80	2724	14	2687	17	2637	34	2551	88	47	55	36	1.170	6000	0.31
78a	Main	0.18608	0.75	14.3061	1.60	0.55758	1.41	0.88	0.14323	3.53	6.8	2.5	1.789	1.41	0.18752	0.71	2708	12	2770	15	2857	33	2705	89	55	102	51	1.874	8480	0.22

* Excluded from regression

* not corre

DC01120 Lat.S deg S Min Lon.E deg E Min

Steenkop Granite Gneiss 29 48.628 22 41.26

Laser Ablation Multicollector ICPMS University of Oslo Puck: DHC0301 const.err.

		ppm			*Ratios*							*Discordance*		*Ages*					
Grain	Age Domain	U	^{206}Pb	206/204	^{207}Pb/^{206}Pb*	1SE	^{207}Pb/^{235}U*	1SE	^{206}Pb/^{238}U*	1SE	Rho	Central (%)	Minimum rim (%)	207/206	1σ	207/235	1σ	206/238	1σ
1	Main	16	8.3	1014	0.1886	0.00088	13.04092	0.30956	0.5015	0.011673	0.981	-4.9	-3.6	2730	7	2683	22	2620	50
2	xenocryst	83	42.1	4188	0.20045	0.00075	13.27152	0.1412	0.480188	0.00478	0.936	-12.9	-11.9	2830	6	2699	10	2528	21
4	Main	284	157.4	13255	0.18694	0.00046	13.54682	0.12516	0.525583	0.004681	0.964	0.3	.	2715	4	2719	9	2723	20
6	Main	75	41.2	10370	0.18748	0.00054	13.63432	0.14124	0.527446	0.005246	0.960	0.5	.	2720	5	2725	10	2731	22
8	Main*	242	115.9	7263	0.18874	0.0005	11.89643	0.11425	0.457144	0.004221	0.961	-13.3	-12.7	2731	4	2596	9	2427	19
9	Main*	7	3.4	713	0.18708	0.00194	13.20096	1.18136	0.511762	0.045491	0.993	-2.4	.	2717	16	2694	84	2664	194
10	Main	29	14.1	1509	0.18512	0.0008	12.21646	0.17937	0.47863	0.006716	0.956	-8	-6.7	2699	7	2621	14	2521	29
15	Main	218	110.9	10306	0.18752	0.00048	12.57483	0.13832	0.486352	0.005203	0.972	-7.4	-6.7	2721	4	2648	10	2555	23
16	Main	40	19.4	1822	0.18671	0.00086	12.4908	0.20153	0.485191	0.007506	0.959	-7.3	-6	2713	7	2642	15	2550	33

* excluded from regression

DC00121

Steenkop Granite Mylonite

Lat.S deg	S Min	Lon.E deg	E Min
29	47.093	22	40.03

Laser Ablation Multicollector ICPMS University of Oslo — Analysed by Magnus Kristoffersen — 2012/12/01

		ppm			*Ratios*							*Discordance*		*Ages*					
Grain	Age Domain	U	^{206}Pb	206/204	^{207}Pb/^{206}Pb	1SE	^{207}Pb/^{235}U*	1SE	^{206}Pb/^{238}U*	1SE	Rho	Central (%)	Minimum rim (%)	207/206	1σ	207/235	1σ	206/238	1σ
1	main	9	6.4	1081	0.18738	0.0023	13.01674	0.54547	0.503812	0.020189	0.956	-4	-0.4	2719	19	2681	40	2630	87
2	main	98	69.8	5201	0.18663	0.00205	13.14241	0.37615	0.510736	0.013502	0.924	-2.4	.	2713	17	2690	27	2660	58
7	xenocryst	45	31	817	0.20409	0.00317	14.00354	0.43412	0.497633	0.013355	0.866	-10.9	-6.9	2859	24	2750	29	2604	57
3	main	73	52	9436	0.18638	0.00207	13.11672	0.3814	0.510424	0.013715	0.924	-2.3	.	2710	18	2688	27	2658	59
4	xenocryst	44	26	1374	0.20293	0.00369	12.04462	0.3712	0.430468	0.010704	0.807	-22.6	-18.7	2850	29	2608	29	2308	48
10	main	50	34.1	2657	0.18788	0.00214	12.76785	0.36143	0.492882	0.012778	0.916	-6.3	-3	2724	18	2663	27	2583	55
12	main	44	30.9	4353	0.19006	0.00214	13.17578	0.3799	0.502793	0.013351	0.921	-5.2	-1.9	2743	17	2692	27	2626	57
9	main	50	28.1	1860	0.18572	0.00209	10.3164	0.26132	0.402876	0.009142	0.896	-22.7	-20.1	2705	17	2464	23	2182	42
11	main	213	156	9066	0.18735	0.00206	13.5951	0.3959	0.526301	0.014197	0.926	0.3	.	2719	17	2722	28	2726	60
19	xenocryst	49	30.5	1346	0.1959	0.00299	12.1	0.34762	0.447258	0.010915	0.848	-17.5	-13.9	2792	24	2611	27	2383	49
15	main	171	115.6	7631	0.18578	0.00204	12.39518	0.35119	0.483908	0.012641	0.922	-7.2	-4.1	2705	18	2635	27	2544	55
18	main	38	24.7	1916	0.18731	0.00211	12.29718	0.35936	0.476144	0.01284	0.923	-9.2	-6.1	2719	18	2627	27	2510	56
20	metamorphic ? grain	61	31.4	3483	0.13211	0.00122	6.80964	0.16127	0.373831	0.008154	0.921	-4.3	-1.3	2126	16	2087	21	2047	38
22	main	49	34.2	2787	0.18742	0.0021	13.0207	0.37661	0.503858	0.01343	0.922	-4	-0.7	2720	18	2681	27	2630	58
25	main	97	70	5038	0.18825	0.0021	13.48956	0.39018	0.519704	0.013874	0.923	-1.3	.	2727	18	2715	27	2698	59
29	main	125	89.1	8371	0.18761	0.00209	13.42143	0.38824	0.518863	0.013848	0.923	-1.2	.	2721	18	2710	27	2694	59
33	main	179	127.3	14926	0.18745	0.00209	13.29474	0.38895	0.514399	0.013917	0.925	-2	.	2720	18	2701	28	2675	59
35	xenocryst	68	44.1	1532	0.19795	0.00323	12.99412	0.39822	0.476098	0.01235	0.846	-12.8	-8.8	2809	27	2679	29	2510	54
34	main	68	41.5	1650	0.19037	0.00228	11.6476	0.32009	0.443753	0.010972	0.9	-16.4	-13.4	2745	20	2577	26	2367	49

DC01130 | Lat.S deg 29 | S Min 48.628 | Lon.E deg 22 | E Min 41.26 | 2012/12/01

Skalkseput Granite

Laser Ablation Multicollector ICPMS University of Oslo Analysed by Magnus Kristoffersen

		ppm			*Ratios*								*Discordance*	*Ages*					
Grain	Age Domain	U	^{206}Pb	206/204	^{207}Pb/^{206}Pb*	1SE	^{207}Pb/^{235}U*	1SE	^{206}Pb/^{238}U*	1SE	Rho	Central (%)	Minimum rim (%)	**207/206**	1σ	207/235	1σ	206/238	1σ
44	main	677	148.1	1250	0.18214	0.00215	4.86022	0.12054	0.193529	0.004223	0.88	-62.3	-61	2672	19	1795	21	1140	23
13*	main	1206	256.5	3842	0.16905	0.00195	4.37415	0.11821	0.187658	0.004586	0.904	-61.3	-59.9	2548	19	1707	22	1109	25
26	main	523	127.2	1218	0.18805	0.00228	5.49432	0.14449	0.2119	0.004943	0.887	-59.7	-58.3	2725	19	1900	23	1239	26
42*	main	1066	266.5	794	0.19069	0.00232	5.78155	0.13909	0.219898	0.004564	0.863	-58.6	-57.2	2748	19	1944	21	1281	24
23	main	550	167.5	1339	0.19408	0.00237	7.11145	0.21026	0.265755	0.007155	0.911	-50.6	-48.8	2777	20	2125	26	1519	36
7	main	777	236.8	2192	0.19068	0.0023	7.02055	0.1994	0.267029	0.006868	0.906	-49.8	-47.9	2748	19	2114	25	1526	35
4	main	611	207.1	1060	0.19397	0.00236	7.85173	0.19887	0.293588	0.006519	0.877	-45.5	-43.5	2776	19	2214	23	1659	32
25	main	329	129.5	2431	0.19695	0.00244	9.19829	0.25777	0.338735	0.008514	0.897	-37.8	-35.5	2801	19	2358	26	1881	41
27	main	546	215	11603	0.19444	0.00237	9.1	0.25774	0.339274	0.008678	0.903	-37.1	-34.8	2780	19	2348	26	1883	42
30	main	399	161	20912	0.19514	0.00239	9.31864	0.2655	0.346343	0.008913	0.903	-35.9	-33.6	2786	19	2370	26	1917	43
10	main	317	134.1	1025	0.20169	0.00253	10.01809	0.31855	0.360238	0.010525	0.919	-34.9	-32.5	2840	19	2436	29	1983	50
2	main	291	131.5	2621	0.20359	0.00259	10.78128	0.32183	0.384071	0.010375	0.905	-31.1	-28.5	2855	20	2504	28	2095	48
3	main	256	115.2	3178	0.20349	0.00257	10.87917	0.34923	0.387756	0.01144	0.919	-30.4	-27.8	2854	20	2513	30	2112	53
40	main	90	46.2	1168	0.20935	0.00271	12.59648	0.39699	0.436394	0.012536	0.911	-23.2	-20.3	2901	20	2650	30	2334	56
49	main	71	41.5	2069	0.20321	0.00265	13.84471	0.47761	0.494122	0.015781	0.926	-11.2	-7.7	2852	21	2739	33	2588	68

* excluded from regression

DC1332 Draghoender Granite

Lat.S deg	S Min	Lon.E deg	E Min
29	23.142	22	7.026

2013/11/21 Session 1845

Sample/ spot #		conventional concordia columns (Pbc corr.) $^{207}Pb/^{235}U$	±σ %	$^{206}Pb/^{238}U$	±σ %	ρ	$^{208}Pb/^{232}Th$	±σ %	Disc. % conv.	Disc. % 2σ lim.	TW concordia columns (Pbc uncorr.) $^{238}U/^{206}Pb$	±σ %	$^{207}Pb/^{206}Pb$	±σ %	Ages Ma $^{207}Pb/^{206}Pb$	±σ	$^{207}Pb/^{235}U$	±σ	$^{206}Pb/^{238}U$	±σ	$^{208}Pb/^{232}Th$	±σ	[U] ppm	[Th] ppm	[Pb] ppm	Th/U meas	$^{206}Pb/^{204}Pb$ measured	f_{206}%
03a*	rim	5.93449	1.19	0.21942	1.13985	0.96	0.065988	7.3	-59.6	-57.9	4.5324	1.14	0.199674	0.31	2794	6	1966	10	1279	13	1292	91	656.6	122.2	180.4	0.19	3401	0.55
05a	main	15.90644	1.14	0.54988	1.11037	0.97	0.144339	5.5	-3.4	-1.0	1.8164	1.11	0.210554	0.27	2904	4	2871	11	2825	25	2725	139	459.4	383.9	361.1	0.84	15513	0.12
16a	main	16.63030	1.19	0.57722	1.13933	0.96	0.144927	5.7	1.7		1.7321	1.14	0.209090	0.34	2897	5	2914	11	2937	27	2736	145	316.3	277.8	261.0	0.88	87698	0.02
16b*	main	16.94868	1.11	0.58278	1.09437	0.98	0.153266	5.5	2.0		1.7152	1.09	0.211198	0.21	2913	3	2932	11	2960	26	2882	146	586.1	581.6	502.8	0.99	43058	0.04
19a	main	10.80008	1.60	0.37317	1.54960	0.97	0.105702	7.8	-34.4	-31.9	2.6747	1.55	0.211091	0.40	2905	7	2506	15	2044	27	2031	151	989.2	484.8	497.9	0.49	9867	0.19
24a*	main	10.53201	1.16	0.38417	1.09492	0.94	0.126170	5.9	-29.9	-27.8	2.5942	1.09	0.200984	0.36	2817	6	2483	11	2096	20	2402	134	396.3	193.3	206.9	0.49	5536	0.34
26a	main	14.21566	1.24	0.49114	1.11775	0.90	0.040691	8.4	-13.7	-10.9	2.0143	1.12	0.216615	0.42	2905	9	2764	12	2576	24	806	66	512.8	1436.5	363.2	2.80	1749	1.07
28a*	main	5.85166	1.81	0.21559	1.74021	0.96	0.060829	5.9	-60.4	-57.9	4.6159	1.75	0.199967	0.46	2800	8	1954	16	1259	20	1194	68	449.9	244.9	131.0	0.54	3842	0.49
31a	core	12.09676	1.18	0.41746	1.10348	0.94	0.104957	5.5	-26.7	-24.5	2.3911	1.10	0.211303	0.39	2907	7	2612	11	2249	21	2017	106	302.6	216.4	175.6	0.72	10259	0.18
33a*	main	15.95583	1.18	0.55790	1.14481	0.97	0.116098	5.5	-1.2		1.7888	1.14	0.208691	0.26	2886	4	2874	11	2858	26	2220	116	390.4	380.0	307.1	0.97	9279	0.20
34a*	main	15.87820	1.21	0.55988	1.12950	0.94	0.137996	7.1	-0.2		1.7852	1.13	0.205993	0.42	2872	7	2869	12	2866	26	2613	173	210.2	8.8	143.1	0.04	38243	0.05
35a*	rim	9.61534	6.28	0.35878	6.13353	0.98	0.162282	17.5	-33.4	-23.7	2.7834	6.14	0.195273	1.36	2780	22	2399	60	1976	105	3040	489	2000.4	29.0	861.9	0.01	13352	0.14
40a*	main	9.18488	1.16	0.33518	1.11474	0.96	0.154027	6.4	-38.8	-37.0	2.9674	1.11	0.202171	0.30	2816	5	2357	11	1863	18	2896	172	513.6	120.4	224.9	0.23	3477	0.54
49a*	core xen	19.09976	1.23	0.60648	1.17028	0.95	0.146391	5.5	0.6		1.6480	1.17	0.228735	0.37	3041	6	3047	12	3056	29	2761	142	198.5	154.3	170.5	0.78	34681	0.05
51a	main	16.11611	1.24	0.55979	1.19829	0.97	0.165322	5.6	-1.3		1.7859	1.20	0.208986	0.30	2896	5	2884	12	2866	28	3092	160	196.0	116.8	151.9	0.60	63241	0.03
* not used in regression due to complex scatter																												
omitted due to high common Pb																												
41a	rim	0.76873	5.52	0.07157	1.09751	0.20	0.003203	9.6	-63.2	-27.4	13.3227	1.10	0.113136	1.78	1144	104	579	25	446	5	65	6	222.2	712.8	19.4	3.21	402	4.65
45a	rim	3.28526	1.65	0.15615	1.17742	0.71	0.015679	10.5	-64.9	-59.8	6.3120	1.18	0.162426	0.98	2375	19	1478	13	935	10	314	33	415.2	149.1	77.1	0.36	1299	1.44
56a	core	1.82375	12.70	0.07605	11.79703	0.93	0.021337	23.3	-84.7	-63.0	12.5181	12.47	0.205683	2.90	2596	76	1054	87	473	54	427	98	289.4	321.4	32.7	1.11	390	4.80
68a	main	2.30135	1.57	0.09213	1.54367	0.98	0.027319	5.7	-82.0	-80.5	10.5322	1.58	0.200559	0.20	2664	5	1213	11	568	8	545	31	3186.3	2166.8	405.9	0.68	631	2.96
69a	main	3.41469	1.73	0.13003	1.10418	0.64	0.008373	15.0	-75.5	-69.7	7.4734	1.10	0.208705	1.08	2746	22	1508	14	788	8	169	25	2175.0	3809.7	368.6	1.75	662	2.83

NORDSIM

DC1333 Welgevonden Granite

Lat.S deg	S Min	Lon.E deg	E Min
30	9.454	22	54.45

2013/11/21

		conventional concordia columns (Pbc corr.)									TW concordia columns (Pbc uncorr.)				ages Ma													
Group		$^{207}Pb/^{235}U$	±σ %	$^{206}Pb/^{238}U$	±σ %	ρ	$^{208}Pb/^{232}Th$	±σ %	Disc. % conv.	Disc. % 2σ lim.	$^{238}U/^{206}Pb$	±σ %	$^{207}Pb/^{206}Pb$	±σ %	$^{207}Pb/^{206}Pb$	±σ	$^{207}Pb/^{235}U$	±σ	$^{206}Pb/^{238}U$	±σ	$^{208}Pb/^{232}Th$	±σ	[U] ppm	[Th] ppm	[Pb] ppm	Th/U meas	$^{206}Pb/^{204}Pb$ measured	f_{206}%
04a	xenocryst core	18.41014	1.52	0.59918	1.48773	0.98	0.178479	5.5	1.1		1.6683	1.49	0.223164	0.32	3001	5	3011	15	3027	36	3319	166	151.4	65.4	122.6	0.43	35725	0.04
04b	main	16.58842	1.52	0.57499	1.49357	0.98	0.114757	5.3	1.2		1.7380	1.49	0.209833	0.26	2900	4	2911	15	2928	35	2196	109	252.3	69.8	183.4	0.28	19703	0.07
05a	xenocryst core	18.13726	1.58	0.57216	1.50056	0.95	0.134927	5.3	-5.5	-2.0	1.7461	1.50	0.230748	0.50	3051	8	2997	15	2917	35	2558	127	70.3	34.6	54.1	0.49	13613	0.10
13a	main	16.57993	1.51	0.57003	1.48876	0.99	0.142045	5.3	-0.2		1.7489	1.49	0.213703	0.19	2913	4	2911	15	2908	35	2685	132	523.7	221.8	393.0	0.42	4252	0.31
13b	main	16.25629	1.54	0.56044	1.49690	0.97	0.138442	6.6	-1.7		1.7810	1.50	0.212012	0.35	2908	6	2892	15	2868	35	2621	163	473.9	204.9	349.8	0.43	7133	0.18
16a	main	7.32816	5.68	0.26065	5.56322	0.98	0.011834	17.9	-53.3	-46.4	3.7677	5.66	0.219963	0.65	2858	19	2152	52	1493	75	238	42	1012.4	1509.1	335.6	1.49	734	1.79
15a	main	6.72202	10.11	0.24404	9.91747	0.98	0.010259	21.0	-55.6	-43.9	3.9839	10.24	0.224744	1.25	2824	32	2076	94	1408	127	206	43	1045.5	1985.9	326.5	1.90	474	2.78
37a	main	15.09875	1.55	0.52114	1.50339	0.97	0.055420	8.1	-8.5	-5.4	1.9045	1.50	0.216762	0.27	2907	6	2821	15	2704	33	1090	86	230.1	84.4	149.8	0.37	1764	0.75
37b	main	15.96715	1.62	0.54946	1.56791	0.97	0.127014	6.4	-3.8	-0.4	1.8186	1.57	0.211447	0.40	2911	6	2875	16	2823	36	2417	145	266.6	38.4	182.3	0.14	17060	0.08
37c	main	17.17427	1.90	0.59649	1.83072	0.96	0.058651	11.4	5.2	0.8	1.6589	1.85	0.218136	0.35	2896	8	2945	18	3016	44	1152	127	256.0	113.0	191.2	0.44	1258	1.05
42b	main	11.70824	2.21	0.40573	2.02374	0.91	0.087984	8.9	-28.6	-24.1	2.4214	2.04	0.224918	0.63	2900	14	2581	21	2195	38	1704	145	581.9	268.1	309.1	0.46	750	1.76
omitted due to high common Pb																												
03a	main	14.82414	2.02	0.52142	1.55509	0.77	0.044422	16.5	-7.3	-1.5	1.8177	1.55	0.252798	0.68	2876	21	2804	19	2705	34	878	141	358.6	242.1	236.3	0.68	252	5.22
04c	rim	12.00782	1.69	0.41154	1.57420	0.93	0.020577	6.7	-28.1	-24.8	2.3477	1.58	0.241623	0.34	2918	10	2605	16	2222	30	412	27	302.7	503.7	161.3	1.66	389	3.38
42a	main	9.59386	9.48	0.33904	7.39101	0.78	0.035212	93.4	-39.5	-15.6	2.8394	7.66	0.238585	2.92	2868	93	2397	91	1882	122	699	632	625.0	266.4	264.8	0.43	353	3.73

DC1510 **Draghoender Granite** Lat. S deg 29 S Min 14.6622 E deg 22 E Min 4.4754 Puck DHC1503

Laser Ablation high resolution ICPMS University of Stellenbosch

Grain Point	Age domain	U [ppm][a]	Pb [ppm][a]	Th [ppm][a]	$^{206}Pb/^{204}Pb$	Th/U[a]	RATIOS $^{207}Pb/^{235}U$[b]	1 σ	$^{206}Pb/^{238}U$[b]	1 σ	rho[c]	$^{207}Pb/^{206}Pb$[e]	1 σ	AGES [Ma] $^{207}Pb/^{235}U$	1 σ	$^{206}Pb/^{238}U$	1 σ	$^{207}Pb/^{206}Pb$	1 σ	Conc. %
14a	main	265	153	115	1302	0.43	17.14	0.29	0.578	0.007	0.74	0.2150	0.0025	2943	50	2942	30	2944	18	100
14b	main	235	136	78	11800	0.33	17.05	0.28	0.578	0.007	0.76	0.2141	0.0023	2938	48	2940	29	2937	17	100
15d	core xenocryst	120	75	73	20513	0.61	20.68	0.34	0.623	0.008	0.76	0.2407	0.0026	3124	52	3122	31	3125	17	100
17	main	290	167	98	5477	0.34	16.92	0.28	0.577	0.007	0.76	0.2128	0.0023	2930	48	2935	29	2927	17	100
18d	core xenocryst	102	63	50	5062	0.49	20.32	0.34	0.620	0.008	0.75	0.2378	0.0026	3107	52	3108	31	3106	17	100
20	main	461	265	73	4041	0.16	16.81	0.28	0.574	0.007	0.76	0.2124	0.0023	2924	48	2925	29	2924	17	100
24d	core xenocryst	83	52	20	5710	0.24	20.61	0.34	0.620	0.008	0.75	0.2410	0.0027	3120	52	3111	31	3127	17	99
26	main	309	158	94	73711	0.30	15.15	0.26	0.513	0.006	0.74	0.2141	0.0024	2824	48	2670	28	2937	18	91
27a	core xenocryst	90	56	37	7247	0.41	20.78	0.35	0.624	0.008	0.75	0.2414	0.0027	3128	52	3127	31	3129	17	100
27d	main	382	165	15	2096	0.04	12.71	0.21	0.432	0.005	0.76	0.2135	0.0023	2659	44	2314	24	2932	17	79
28	main	337	172	113	8015	0.34	15.09	0.25	0.509	0.006	0.75	0.2151	0.0024	2821	47	2652	27	2945	18	90
35a	main	251	145	66	48139	0.26	17.12	0.28	0.578	0.007	0.76	0.2148	0.0023	2942	49	2941	29	2942	17	100
35b	main	245	141	65	21845	0.26	17.08	0.28	0.577	0.007	0.76	0.2146	0.0023	2939	48	2937	29	2941	17	100
36a	main	327	186	2	6578	0.01	16.73	0.28	0.569	0.007	0.75	0.2134	0.0024	2919	49	2902	29	2931	18	99
36b	main	301	152	2	23588	0.01	14.88	0.25	0.506	0.006	0.74	0.2132	0.0025	2807	48	2640	27	2930	18	90
36d	core xenocryst	105	66	34	2962	0.33	20.95	0.35	0.627	0.008	0.75	0.2423	0.0027	3136	52	3138	31	3135	17	100
39	main	450	258	148	120074	0.33	16.88	0.28	0.575	0.007	0.75	0.2131	0.0023	2928	49	2927	29	2929	18	100
43d	core xenocryst	82	51	29	236174	0.35	20.17	0.34	0.617	0.008	0.75	0.2372	0.0026	3100	52	3097	31	3101	18	100
44a	main	476	168	117	21600	0.25	10.49	0.18	0.353	0.004	0.74	0.2155	0.0024	2479	42	1949	21	2948	18	66
44b	main	321	185	3	10606	0.01	16.97	0.28	0.576	0.007	0.76	0.2136	0.0023	2933	48	2933	29	2933	17	100
45	main	271	156	89	12981	0.33	17.05	0.28	0.577	0.007	0.75	0.2143	0.0023	2938	49	2937	29	2939	18	100
46	main	672	262	180	851	0.27	11.36	0.20	0.390	0.005	0.70	0.2114	0.0027	2553	45	2121	23	2916	20	73
55a	main	255	155	66	180379	0.26	19.54	0.32	0.610	0.008	0.75	0.2325	0.0025	3069	51	3069	30	3069	17	100
55d	core	53	26	20	1084	0.38	16.96	0.30	0.495	0.006	0.73	0.2487	0.0030	2933	52	2591	27	3177	19	82
60d	main	492	284	113	2822	0.23	16.93	0.28	0.578	0.007	0.75	0.2125	0.0023	2931	48	2939	29	2925	17	100
61	main	215	125	61	19934	0.28	17.23	0.29	0.579	0.007	0.75	0.2160	0.0024	2948	49	2943	30	2951	18	100
62	main	272	158	110	45721	0.40	17.19	0.29	0.579	0.007	0.75	0.2153	0.0024	2946	49	2945	30	2946	18	100
72	core xenocryst	99	61	39	7713	0.40	20.41	0.34	0.621	0.008	0.75	0.2385	0.0027	3111	52	3112	31	3110	18	100
74d	main	201	101	47	22336	0.23	14.97	0.26	0.503	0.006	0.72	0.2159	0.0026	2813	50	2626	28	2951	19	89
77a	main	297	162	101	17146	0.34	16.12	0.27	0.545	0.007	0.75	0.2146	0.0024	2884	48	2804	28	2941	18	95
77b	core xenocryst	107	67	60	10654	0.56	20.67	0.35	0.625	0.008	0.75	0.2400	0.0027	3123	53	3129	31	3120	18	100
78d	core xenocryst	327	181	117	7055	0.36	16.28	0.27	0.553	0.007	0.74	0.2135	0.0024	2894	49	2839	29	2932	18	97
80d	core xenocryst	717	410	123	16417	0.17	16.74	0.28	0.572	0.007	0.75	0.2121	0.0023	2920	49	2918	29	2921	18	100
81	main	332	191	35	16139	0.11	17.03	0.28	0.575	0.007	0.75	0.2146	0.0024	2936	49	2930	29	2941	18	100
85	main	35	20	7	11152	0.19	17.00	0.34	0.578	0.007	0.64	0.2135	0.0033	2935	59	2939	30	2932	25	100
86d	core xenocryst	431	257	361	4601	0.84	18.29	0.31	0.596	0.007	0.73	0.2228	0.0026	3005	51	3012	30	3001	19	100
95d	main	336	194	171	6970	0.51	17.19	0.29	0.578	0.007	0.74	0.2158	0.0024	2945	49	2939	30	2950	18	100
97	main	213	123	72	7014	0.34	17.00	0.29	0.575	0.007	0.74	0.2145	0.0024	2935	49	2928	29	2940	18	100
100a	main	184	106	38	49183	0.20	17.08	0.29	0.576	0.007	0.74	0.2152	0.0024	2940	50	2932	30	2945	18	100
100b	main	812	229	81	1102	0.10	8.16	0.14	0.282	0.004	0.74	0.2098	0.0024	2248	38	1601	18	2904	18	55
101	main	262	152	89	4021	0.34	17.24	0.29	0.578	0.007	0.74	0.2162	0.0024	2949	50	2942	30	2953	18	100
103a	main	237	137	60	28896	0.25	17.14	0.29	0.579	0.007	0.74	0.2147	0.0024	2943	50	2945	30	2941	18	100
103b	main	266	154	88	15866	0.33	17.17	0.29	0.580	0.007	0.74	0.2148	0.0024	2944	50	2947	30	2942	18	100
103c	main	162	93	66	25443	0.41	17.07	0.29	0.576	0.007	0.74	0.2152	0.0025	2939	50	2931	30	2945	19	100
112d	core xenocryst	109	68	37	18519	0.33	20.58	0.35	0.622	0.008	0.74	0.2400	0.0028	3119	53	3117	31	3120	18	100
116a	main	255	148	108	16275	0.42	17.28	0.30	0.579	0.007	0.73	0.2163	0.0025	2950	51	2946	30	2954	19	100
116b	main	238	138	79	12768	0.33	17.31	0.30	0.579	0.007	0.73	0.2169	0.0025	2952	51	2943	30	2958	19	100
118	main	322	178	101	11604	0.31	16.26	0.28	0.554	0.007	0.73	0.2130	0.0025	2892	50	2840	29	2929	19	97
119	core xenocryst	73	45	21	8746	0.29	20.54	0.36	0.622	0.008	0.73	0.2395	0.0029	3117	54	3118	31	3117	19	100
120	main	238	110	8	3065	0.03	13.69	0.23	0.461	0.006	0.73	0.2151	0.0025	2728	47	2446	26	2945	19	83
121a	main	370	206	106	4175	0.29	16.48	0.28	0.555	0.007	0.74	0.2152	0.0025	2905	49	2848	29	2945	18	97
121b	main	307	177	72	9969	0.23	17.04	0.29	0.576	0.007	0.73	0.2146	0.0025	2937	51	2932	30	2941	19	100
127	main	292	168	85	16920	0.29	17.03	0.29	0.576	0.007	0.73	0.2144	0.0025	2937	50	2933	30	2939	19	100
129	core xenocryst	228	136	76	1286	0.33	18.35	0.32	0.594	0.008	0.73	0.2241	0.0027	3008	52	3005	30	3010	19	100
132d	core xenocryst	188	119	72	873	0.38	21.33	0.37	0.630	0.008	0.73	0.2458	0.0029	3154	55	3148	31	3158	19	100
133a	core xenocryst	447	199	85	1218	0.19	13.87	0.25	0.446	0.006	0.71	0.2256	0.0029	2741	49	2377	25	3021	20	79
133b	core xenocryst	435	195	119	988	0.27	13.89	0.25	0.449	0.006	0.71	0.2243	0.0028	2743	49	2392	25	3012	20	79

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using ($^{207}Pb/^{206}Pb$)/($^{238}U/^{206}Pb$ * 1/137.88)

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

DC1512 Skalkseput Granite | Lat. S deg 29 | S Min 21.8592 | E deg 22 | E Min 8.6556 | Puck DHC1503

Laser Ablation high resolution ICPMS | University of Stellenbosch

							RATIOS							AGES [Ma]						Conc.
grain	**Age Domain**	**U [ppm][a]**	**Pb [ppm][a]**	**Th [ppm]**	**$^{206}Pb/^{204}Pb$**	**Th/U meas**	**$^{207}Pb/^{235}U^{b}$**	**1 σ[d]**	**$^{206}Pb/^{238}U^{b}$**	**1 σ[d]**	**rho[c]**	**$^{207}Pb/^{206}Pb^{e}$**	**1 σ[d]**	**$^{207}Pb/^{235}U$**	**1 σ[d]**	**$^{206}Pb/^{238}U$**	**1 σ[d]**	**$^{207}Pb/^{206}Pb$**	**1 σ[d]**	**%**
77c	main	2842	517	865	8439	0.30	4.34	0.08	0.182	0.002	0.72	0.1731	0.0021	1702	30	1078	13	2588	20	42
77a	main	2537	620	1175	1320	0.46	5.96	0.10	0.244	0.003	0.73	0.1769	0.0021	1970	34	1409	16	2624	20	54
85a	main	1102	314	313	1184	0.28	8.22	0.14	0.285	0.004	0.72	0.2095	0.0025	2256	39	1615	18	2901	20	56
68a	main	1654	481	57	1007	0.03	8.24	0.14	0.291	0.004	0.73	0.2055	0.0024	2258	39	1645	18	2871	19	57
21d	core	218	73	192	1151	0.88	9.77	0.20	0.337	0.005	0.66	0.2103	0.0033	2413	50	1872	22	2908	25	64
28	main	309	115	230	1497	0.75	10.93	0.19	0.372	0.005	0.74	0.2131	0.0025	2517	43	2040	22	2929	19	70
89d	core	345	129	123	1977	0.36	10.89	0.19	0.375	0.005	0.71	0.2106	0.0026	2514	45	2054	22	2910	20	71
85b	main	792	302	166	3263	0.21	10.54	0.18	0.381	0.005	0.72	0.2005	0.0025	2484	44	2083	22	2830	20	74
68	main	360	163	402	2167	1.12	13.24	0.23	0.454	0.006	0.72	0.2117	0.0026	2697	47	2412	25	2918	19	83
32d	core	135	65	48	5735	0.36	13.97	0.25	0.482	0.006	0.72	0.2101	0.0026	2748	49	2536	27	2907	20	87
77b	main	841	408	114	5167	0.14	13.92	0.24	0.485	0.006	0.73	0.2083	0.0025	2744	47	2547	26	2893	19	88
49d	core	260	128	111	5650	0.43	14.28	0.24	0.493	0.006	0.74	0.2102	0.0024	2768	47	2583	27	2907	18	89
54	main	740	364	14	7074	0.02	14.09	0.24	0.492	0.006	0.74	0.2078	0.0024	2756	47	2578	27	2889	18	89
34a	main	330	169	145	6078	0.44	14.80	0.24	0.513	0.006	0.76	0.2095	0.0023	2803	46	2667	27	2901	17	92
36b	main	488	254	111	4826	0.23	15.13	0.26	0.522	0.007	0.74	0.2103	0.0024	2824	48	2707	28	2908	18	93
67	main	623	325	332	14728	0.53	15.03	0.26	0.521	0.007	0.71	0.2095	0.0026	2817	49	2701	28	2901	20	93
34b	main	225	121	105	5887	0.47	15.62	0.26	0.537	0.007	0.75	0.2108	0.0023	2854	47	2773	28	2912	18	95
34c	main	217	116	100	12338	0.46	15.52	0.26	0.537	0.007	0.75	0.2096	0.0023	2847	48	2770	28	2903	18	95
68d	core	147	80	61	9098	0.41	15.85	0.28	0.545	0.007	0.73	0.2112	0.0025	2868	50	2802	29	2915	19	96
36d	core	202	111	46	14837	0.23	15.95	0.27	0.550	0.007	0.75	0.2104	0.0024	2874	48	2824	29	2908	18	97
53b	main	171	95	58	11945	0.34	15.98	0.27	0.553	0.007	0.74	0.2095	0.0024	2876	49	2839	29	2902	18	98
33d	core	224	128	133	20516	0.59	16.66	0.28	0.569	0.007	0.75	0.2124	0.0023	2916	49	2903	29	2924	18	99
56d	core	81	46	58	3165	0.72	16.54	0.33	0.567	0.008	0.67	0.2114	0.0032	2908	59	2897	31	2916	24	99
64d	core	217	123	56	5473	0.26	16.57	0.29	0.569	0.007	0.73	0.2112	0.0025	2910	50	2903	29	2915	19	100
9	main	246	140	137	17680	0.55	16.56	0.27	0.569	0.007	0.76	0.2111	0.0023	2910	48	2904	29	2914	17	100
92	main	124	71	42	8907	0.34	16.38	0.29	0.567	0.007	0.71	0.2093	0.0026	2899	52	2897	30	2900	20	100
36a	main	255	145	53	7352	0.21	16.46	0.28	0.569	0.007	0.75	0.2099	0.0023	2904	49	2903	29	2905	18	100
37d*	core xenocryst	104	65	42	12556	0.41	20.57	0.35	0.622	0.008	0.74	0.2399	0.0027	3119	53	3118	31	3119	18	100
19d	core	135	76	44	59471	0.33	16.42	0.27	0.569	0.007	0.75	0.2095	0.0023	2902	48	2902	29	2902	18	100
3bd	core	107	61	36	18981	0.34	16.36	0.28	0.568	0.007	0.73	0.2090	0.0025	2898	50	2899	30	2898	19	100
40	main	224	127	110	15617	0.49	16.45	0.28	0.569	0.007	0.74	0.2096	0.0024	2903	49	2904	29	2903	18	100
58d	core	119	68	30	13167	0.25	16.38	0.28	0.569	0.007	0.73	0.2089	0.0025	2899	50	2903	29	2897	19	100
6	main	729	413	335	11618	0.46	16.27	0.27	0.567	0.007	0.76	0.2080	0.0022	2893	48	2897	29	2890	17	100
84d*	core xenocryst	535	326	1046	3384	1.96	19.36	0.35	0.609	0.008	0.71	0.2305	0.0029	3060	55	3067	31	3056	20	100
53a	main	264	150	93	21232	0.35	16.35	0.28	0.569	0.007	0.74	0.2084	0.0024	2898	49	2905	29	2893	18	100

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using ($^{207}Pb/^{206}Pb$)/($^{238}U/^{206}Pb$ * 1/137.88)

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

[*] not used in regression

DC1513 Skalkseput Granite Lat. S deg S Min E deg E Min Puck DHC1503

29 18.252 22 9.1764 Laser Ablation high resolution ICPMS University of Stellenbosch

							RATIOS							AGES [Ma]						Conc.
Grain	**Age Domain**	**U [ppm][a]**	**Pb [ppm][a]**	**Th [ppm]**	**$^{206}Pb/^{204}Pb$**	**Th/U meas**	**$^{207}Pb/^{235}U$[b]**	**1 σ[d]**	**$^{206}Pb/^{238}U$[b]**	**1 σ[d]**	**rho[c]**	**$^{207}Pb/^{206}Pb$**	**1 σ[d]**	**$^{207}Pb/^{235}U$**	**1 σ[d]**	**$^{206}Pb/^{238}U$**	**1 σ[d]**	**$^{207}Pb/^{206}Pb$**	**1 σ[d]**	%
13	core	531	135	117	1058	0.22	7.43	0.13	0.254	0.003	0.73	0.2124	0.0025	2165	37	1458	16	2924	19	50
14a	core	114	45	46	873	0.41	11.54	0.31	0.393	0.006	0.57	0.2129	0.0047	2568	70	2137	28	2928	35	73
15	core	2957	303	1018	271	0.34	2.99	0.05	0.103	0.001	0.75	0.2117	0.0023	1406	23	629	7	2918	17	22
20b	core	188	79	96	4482	0.51	12.25	0.21	0.421	0.005	0.73	0.2110	0.0025	2624	45	2265	24	2914	19	78
27	core	479	154	78	2041	0.16	9.33	0.17	0.322	0.004	0.70	0.2102	0.0027	2371	43	1799	20	2907	21	62
31	core	273	110	57	1783	0.21	11.62	0.19	0.403	0.005	0.74	0.2091	0.0024	2574	43	2182	23	2899	18	75
51a	core	223	72	63	942	0.28	9.46	0.20	0.323	0.004	0.64	0.2122	0.0034	2383	50	1806	21	2922	26	62
52b	core	175	77	61	2659	0.35	12.60	0.22	0.437	0.005	0.71	0.2094	0.0026	2650	46	2335	24	2901	20	81
54b	core	154	36	59	925	0.38	6.76	0.18	0.232	0.003	0.56	0.2109	0.0046	2080	54	1347	18	2912	35	46
14b	main	824	387	167	2994	0.20	13.54	0.22	0.470	0.006	0.76	0.2089	0.0022	2718	44	2484	25	2897	17	86
17	main	143	32	4	358	0.03	6.31	0.14	0.221	0.003	0.62	0.2068	0.0036	2020	45	1289	16	2880	28	45
18a	main	113	41	43	3451	0.38	10.50	0.20	0.360	0.005	0.68	0.2113	0.0029	2480	47	1984	22	2915	22	68
18b	main	191	45	29	2666	0.15	6.88	0.12	0.237	0.003	0.73	0.2107	0.0024	2096	36	1370	15	2911	19	47
18c	main	162	93	54	15200	0.34	16.59	0.28	0.572	0.007	0.73	0.2104	0.0024	2911	49	2915	29	2909	18	100
19	main	1050	346	130	1145	0.12	9.56	0.16	0.329	0.004	0.73	0.2105	0.0025	2394	41	1836	20	2909	19	63
20a	main	1033	199	383	971	0.37	5.60	0.09	0.193	0.002	0.75	0.2108	0.0023	1916	31	1135	13	2912	18	39
22a	main	2382	193	165	197	0.07	2.36	0.04	0.081	0.001	0.75	0.2110	0.0023	1229	20	502	6	2913	18	17
22b	main	433	194	46	2285	0.11	13.04	0.22	0.449	0.006	0.74	0.2108	0.0024	2682	45	2389	25	2912	18	82
23	main	166	83	73	3843	0.44	14.53	0.25	0.499	0.006	0.72	0.2114	0.0026	2785	49	2608	27	2916	20	89
26a	main	1287	266	62	988	0.05	5.97	0.10	0.206	0.003	0.72	0.2098	0.0025	1972	34	1210	14	2904	19	42
26b	main	801	179	95	1003	0.12	6.47	0.11	0.223	0.003	0.74	0.2105	0.0024	2042	34	1298	14	2910	18	45
29a	main	665	93	120	342	0.18	4.07	0.07	0.140	0.002	0.72	0.2101	0.0026	1648	29	847	10	2906	20	29
29b	main	952	321	288	1168	0.30	9.72	0.16	0.337	0.004	0.74	0.2094	0.0024	2409	40	1870	20	2901	18	64
30	main	734	364	220	2646	0.30	14.39	0.25	0.496	0.006	0.72	0.2105	0.0025	2776	48	2597	27	2909	19	89
33	main	373	181	138	4134	0.37	14.08	0.24	0.486	0.006	0.74	0.2103	0.0024	2755	46	2551	26	2908	18	88
35	main	189	92	79	6086	0.42	14.23	0.25	0.489	0.006	0.72	0.2111	0.0025	2765	48	2566	26	2914	19	88
39	main	145	14	38	177	0.26	2.85	0.07	0.098	0.001	0.56	0.2104	0.0046	1369	36	604	8	2909	35	21
43	main	3351	374	287	344	0.09	3.22	0.05	0.112	0.001	0.73	0.2097	0.0024	1463	25	682	8	2903	19	23
44	main	56	17	87	341	1.55	8.77	0.18	0.302	0.004	0.65	0.2110	0.0032	2315	46	1699	20	2913	24	58
45	main	1325	139	301	270	0.23	3.05	0.05	0.105	0.001	0.71	0.2106	0.0026	1421	25	644	8	2910	20	22
48	main	964	278	306	1920	0.32	8.35	0.14	0.288	0.004	0.72	0.2103	0.0025	2270	39	1632	18	2908	19	56
52a	main	493	218	24	2483	0.05	12.85	0.22	0.441	0.005	0.72	0.2114	0.0025	2669	46	2355	24	2917	19	81
52c	main	163	37	20	562	0.12	6.46	0.13	0.224	0.003	0.64	0.2087	0.0032	2040	41	1305	15	2896	25	45

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using ($^{207}Pb/^{206}Pb$)/($^{238}U/^{206}Pb$ * 1/137.88)

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

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Zeekoebaard Ventersdorp 29 30.8982 22 18.6924 Laser Ablation high resolution ICPMS University of Stellenbosch

Grain	Age Domain	U [ppm][a]	Pb [ppm][a]	Th [ppm]	$^{206}Pb/^{204}Pb$	Th/U calc	$^{207}Pb/^{235}U$[b]	1 σ[d]	$^{206}Pb/^{238}U$[b]	1 σ[d]	rho[c]	$^{207}Pb/^{206}Pb$	1 σ[d]	$^{207}Pb/^{235}U$	1 σ[d]	$^{206}Pb/^{238}U$	1 σ[d]	$^{207}Pb/^{206}Pb$	1 σ[d]	%
1	detrital	125	66	131	11254	0.21	13.73	0.22	0.5275	0.0064	0.74	0.18878	0.00205	2731	44	2731	27	2732	18	100
2	detrital	1076	474	671	28803	0.13	10.81	0.17	0.4407	0.0053	0.75	0.17788	0.00187	2507	40	2354	24	2633	17	89
3	detrital	38	20	29	2560	0.16	13.65	0.23	0.5261	0.0065	0.72	0.18819	0.00224	2726	47	2725	27	2726	19	100
4	detrital	36	18	27	2788	0.17	13.31	0.23	0.5073	0.0063	0.72	0.19037	0.00229	2702	47	2645	27	2745	20	96
5	detrital	16	8	9	1487	0.12	13.51	0.26	0.5175	0.0066	0.68	0.18934	0.00264	2716	51	2689	28	2736	23	98
6	detrital	30	16	23	4219	0.16	13.27	0.23	0.5126	0.0064	0.71	0.18771	0.00231	2699	47	2668	27	2722	20	98
7	detrital	34	17	29	2581	0.18	13.38	0.23	0.5117	0.0063	0.71	0.18959	0.00230	2707	47	2664	27	2739	20	97
8	detrital	190	97	164	19440	0.18	13.24	0.21	0.5090	0.0061	0.75	0.18859	0.00201	2697	43	2652	26	2730	17	97
9	detrital	38	20	32	9079	0.17	13.51	0.23	0.5234	0.0065	0.72	0.18724	0.00224	2716	47	2713	27	2718	20	100
10	detrital	36	19	30	2546	0.17	13.72	0.24	0.5275	0.0065	0.71	0.18862	0.00228	2730	47	2731	28	2730	20	100
11	detrital	69	34	64	22658	0.21	13.03	0.22	0.4991	0.0061	0.73	0.18938	0.00213	2682	44	2610	26	2737	18	95
12	detrital	306	158	260	21451	0.18	13.23	0.21	0.5162	0.0062	0.75	0.18594	0.00196	2697	43	2683	26	2707	17	99
13	detrital	24	13	18	3520	0.15	13.83	0.25	0.5320	0.0067	0.70	0.18851	0.00244	2738	49	2750	28	2729	21	101
14	detrital	676	354	465	38900	0.13	13.62	0.22	0.5244	0.0063	0.75	0.18837	0.00198	2724	43	2718	27	2728	17	100
15	detrital	56	26	54	119615	0.23	11.75	0.20	0.4633	0.0057	0.73	0.18388	0.00213	2584	44	2454	25	2688	19	91
16	detrital	51	27	57	5206	0.22	13.68	0.23	0.5268	0.0065	0.73	0.18834	0.00219	2728	46	2728	27	2728	19	100
17	detrital	467	246	291	39099	0.13	13.62	0.22	0.5272	0.0063	0.75	0.18738	0.00196	2724	43	2730	27	2719	17	100
18	detrital	37	19	33	3624	0.19	13.51	0.23	0.5133	0.0063	0.72	0.19087	0.00228	2716	47	2671	27	2750	20	97
19	detrital	74	34	87	6062	0.25	11.76	0.20	0.4636	0.0057	0.73	0.18401	0.00208	2586	43	2456	25	2689	19	91
20	detrital	404	205	305	27790	0.15	13.07	0.21	0.5074	0.0061	0.75	0.18675	0.00196	2684	43	2646	26	2714	17	97
21	detrital	35	19	34	4275	0.19	13.56	0.24	0.5263	0.0065	0.71	0.18685	0.00227	2719	47	2726	28	2715	20	100
22	detrital	349	183	316	24817	0.18	13.61	0.22	0.5255	0.0063	0.75	0.18779	0.00198	2723	44	2722	27	2723	17	100
23	detrital	126	66	121	30545	0.20	13.76	0.22	0.5270	0.0064	0.74	0.18934	0.00206	2733	44	2729	27	2737	18	100
25	detrital	470	246	350	45373	0.15	13.64	0.22	0.5248	0.0063	0.75	0.18852	0.00198	2725	44	2719	27	2729	17	100
26	detrital	32	17	26	2543	0.16	13.47	0.24	0.5256	0.0066	0.71	0.18584	0.00232	2713	48	2723	28	2706	20	101
27	detrital	32	16	19	2641	0.12	13.01	0.23	0.5065	0.0063	0.71	0.18630	0.00229	2680	47	2642	27	2710	20	97
28	detrital	26	13	16	2643	0.13	13.25	0.24	0.5104	0.0064	0.70	0.18824	0.00239	2697	48	2659	27	2727	21	97
29	detrital	28	15	20	6072	0.14	13.46	0.24	0.5155	0.0064	0.71	0.18939	0.00236	2713	48	2680	27	2737	20	98
30	detrital	330	173	284	24911	0.17	13.60	0.22	0.5253	0.0063	0.75	0.18775	0.00199	2722	44	2722	27	2723	17	100
31	detrital	30	16	31	2550	0.21	13.60	0.24	0.5252	0.0066	0.70	0.18777	0.00236	2722	48	2721	28	2723	21	100
32	detrital	25	13	17	1705	0.14	13.48	0.24	0.5262	0.0066	0.70	0.18580	0.00241	2714	49	2726	28	2705	21	101
33	detrital	31	17	25	4477	0.16	13.65	0.24	0.5266	0.0066	0.71	0.18796	0.00232	2726	48	2727	28	2724	20	100
34	detrital	23	12	16	2361	0.14	13.44	0.25	0.5236	0.0066	0.69	0.18617	0.00245	2711	49	2714	28	2709	22	100
35	detrital	37	19	36	12405	0.19	13.19	0.23	0.5121	0.0064	0.70	0.18678	0.00236	2693	48	2666	27	2714	21	98
36	detrital	466	244	355	28040	0.15	13.50	0.22	0.5236	0.0063	0.75	0.18697	0.00197	2715	43	2715	27	2716	17	100
37	detrital	315	165	265	17682	0.17	13.51	0.22	0.5249	0.0063	0.75	0.18675	0.00199	2716	44	2720	27	2714	17	100
38	detrital	90	39	76	4995	0.22	11.20	0.23	0.4337	0.0058	0.64	0.18729	0.00303	2540	53	2322	26	2719	26	85
39	detrital	43	22	35	9335	0.16	13.81	0.24	0.5251	0.0065	0.72	0.19082	0.00225	2737	47	2721	27	2749	19	99
40	detrital	925	259	734	4498	0.28	7.23	0.12	0.2805	0.0034	0.75	0.18692	0.00197	2140	34	1594	17	2715	17	59
41	detrital	93	46	82	7822	0.21	12.59	0.21	0.4918	0.0060	0.73	0.18561	0.00214	2649	45	2579	26	2704	19	95
42	detrital	46	24	42	3558	0.18	13.63	0.23	0.5272	0.0065	0.72	0.18756	0.00221	2725	46	2730	27	2721	19	100
43	detrital	409	215	380	986631	0.18	13.70	0.24	0.5251	0.0065	0.71	0.18924	0.00231	2729	48	2721	28	2736	20	99
44	detrital	54	28	48	8679	0.17	13.58	0.23	0.5256	0.0065	0.72	0.18741	0.00219	2721	46	2723	27	2720	19	100
45	detrital	620	326	501	71189	0.16	13.47	0.22	0.5247	0.0063	0.75	0.18624	0.00197	2713	44	2719	27	2709	17	100
46	detrital	523	274	430	83891	0.16	13.52	0.22	0.5238	0.0063	0.75	0.18722	0.00198	2717	44	2715	27	2718	17	100
47	detrital	555	290	443	55472	0.15	13.38	0.22	0.5226	0.0063	0.75	0.18571	0.00197	2707	44	2710	27	2705	17	100
48	detrital	24	12	23	2781	0.17	13.26	0.24	0.5094	0.0064	0.70	0.18872	0.00244	2698	49	2654	27	2731	21	97
50	detrital	33	17	29	2087	0.18	13.68	0.24	0.5256	0.0065	0.71	0.18881	0.00231	2728	48	2723	28	2732	20	100
51	detrital	326	171	282	39294	0.18	13.50	0.22	0.5247	0.0064	0.75	0.18653	0.00199	2715	44	2719	27	2712	18	100
52	detrital	511	236	397	14472	0.18	11.89	0.19	0.4625	0.0056	0.75	0.18652	0.00198	2596	42	2451	25	2712	17	90
53	detrital	49	26	49	16854	0.21	13.48	0.23	0.5228	0.0064	0.72	0.18699	0.00219	2714	46	2711	27	2716	19	100
54	detrital	88	47	60	42826	0.15	13.73	0.23	0.5279	0.0065	0.73	0.18863	0.00214	2731	46	2732	27	2730	19	100
55	detrital	479	252	336	231574	0.14	13.69	0.22	0.5271	0.0064	0.75	0.18833	0.00201	2728	44	2729	27	2728	17	100
56	detrital	335	167	677	4583	0.34	12.67	0.22	0.4973	0.0061	0.72	0.18480	0.00221	2655	46	2602	26	2696	20	96
57	detrital	52	25	53	1916	0.20	12.31	0.29	0.4759	0.0067	0.60	0.18759	0.00347	2628	61	2509	29	2721	30	92
58	detrital	370	196	338	74766	0.19	13.74	0.22	0.5287	0.0064	0.75	0.18851	0.00202	2732	44	2736	27	2729	18	100
59	detrital	116	61	165	17587	0.22	13.84	0.23	0.5278	0.0064	0.74	0.19015	0.00212	2739	45	2732	27	2744	18	100
60	detrital	33	17	22	4629	0.15	13.39	0.25	0.5228	0.0067	0.68	0.18569	0.00253	2707	50	2711	28	2704	22	100
61	detrital	28	15	19	1063	0.14	13.59	0.24	0.5248	0.0066	0.70	0.18779	0.00239	2721	49	2720	28	2723	21	100
62	detrital	32	17	24	2393	0.17	13.63	0.24	0.5248	0.0066	0.70	0.18838	0.00240	2724	49	2720	28	2728	21	100
63	detrital	33	15	14	66740	0.13	11.23	0.28	0.4348	0.0063	0.58	0.18730	0.00376	2542	63	2327	28	2719	33	86
64	detrital	36	18	26	3180	0.16	12.93	0.24	0.5011	0.0063	0.69	0.18717	0.00246	2675	49	2619	27	2718	21	96
65	detrital	53	28	52	8407	0.21	13.65	0.23	0.5228	0.0065	0.72	0.18934	0.00223	2726	46	2711	27	2737	19	99
66	detrital	30	16	21	3853	0.14	13.82	0.25	0.5289	0.0066	0.71	0.18956	0.00238	2738	49	2737	28	2738	21	100
67	detrital	121	64	103	9411	0.18	13.63	0.23	0.5268	0.0064	0.74	0.18768	0.00209	2725	45	2728	27	2722	18	100
68	detrital	27	14	19	2441	0.15	13.46	0.24	0.5252	0.0066	0.70	0.18593	0.00242	2713	49	2721	28	2707	21	101
69	detrital	157	83	93	4726	0.13	13.69	0.24	0.5253	0.0065	0.72	0.18896	0.00228	2728	47	2722	28	2733	20	100
70	detrital	45	22	35	3014	0.16	12.72	0.22	0.4962	0.0061	0.72	0.18592	0.00224	2659	46	2598	26	2706	20	96
71	detrital	351	184	339	42115	0.17	13.56	0.22	0.5240	0.0064	0.75	0.18775	0.00204	2720	44	2716	27	2723	18	100
72	detrital	51	27	51	61022	0.19	13.48	0.23	0.5236	0.0065	0.72	0.18667	0.00222	2714	47	2714	27	2713	20	100
73	detrital	31	16	23	3130	0.14	13.63	0.24	0.5251	0.0066	0.70	0.18829	0.00239	2724	49	2721	28	2727	21	100
74	detrital	37	18	23	82609	0.15	12.64	0.26	0.4898	0.0065	0.65	0.18723	0.00288	2654	54	2570	28	2718	25	95
75	detrital	421	220	237	1008791	0.12	13.43	0.22	0.5239	0.0064	0.74	0.18598	0.00205	2711	44	2716	27	2707	18	100
76	detrital	377	198	309	906747	0.16	13.49	0.22	0.5251	0.0064	0.74	0.18628	0.00204	2714	44	2721	27	2710	18	100
77	detrital	461	242	313	30795	0.13	13.64	0.22	0.5256	0.0064	0.74	0.18825	0.00205	2725	44	2723	27	2727	18	100
78	detrital	57	28	115	9159	0.23	12.73	0.22	0.4947	0.0061	0.72	0.18669	0.00221	2660	45	2591	26	2713	19	95
79	detrital	213	105	151	22961	0.15	12.67	0.21	0.4955	0.0060	0.74	0.18547	0.00205	2656	44	2594	26	2702	18	96
80	detrital	23	12	16	7827	0.14	13.60	0.25	0.5268	0.0067	0.69	0.18727	0.00247	2722	50	2728	28	2718	22	100
81	detrital	505	265	342	44934	0.13	13.55	0.22	0.5253	0.0064	0.74	0.18712	0.00208	2719	45	2722	27	2717	18	100
82	detrital	105	55	114	13209	0.23	13.51	0.23	0.5249	0.0065	0.73	0.18672	0.00217	2716	46	2720	27	2714	19	100
83	detrital	18	10	12	2575	0.13	13.72	0.26	0.5273	0.0068	0.68	0.18865	0.00260	2730	51	2730	28	2731	22	100
84	detrital	35	18	30	7519	0.17	13.34	0.24	0.5221	0.0065	0.71	0.18531	0.00231	2704	48	2708	28	2701	20	100
85	detrital	320	167	215	38226	0.14	13.48	0.22	0.5224	0.0064	0.74	0.18718	0.00206	2714	45	2709	27	2718	18	100
86	detrital	830	440	522	42756	0.12	13.89	0.23	0.5297	0.0065	0.73	0.19018	0.00220	2742	46	2740	27	2744	19	100
87	detrital	182	95	168	19680	0.18	13.37	0.22	0.5216	0.0064	0.74	0.18589	0.00208	2706	45	2706	27	2706	18	100
88	detrital	678	357	554	50933	0.15	13.59	0.22	0.5259	0.0064	0.74	0.18737	0.00208	2721	45	2724	27	2719	18	100
89	detrital	417	219	370	19267	0.18	13.62	0.22	0.5266	0.0064	0.74	0.18754	0.00206	2723	45	2727	27	2721	18	100
90	detrital	309	162	280	21150	0.18	13.49	0.22	0.5246	0.0064	0.74	0.18658	0.00207	2715	45	2719	27	2712	18	100
91	detrital	242	127	301	21506	0.22	13.61	0.23	0.5252	0.0064	0.74	0.18799	0.00210	2723	45	2721	27	2725	18	100
92	detrital	516	270	577	30122	0.21	13.64	0.22	0.5238	0.0064	0.74	0.18892	0.00208	2725	45	2715	27	2733	18	99
93	detrital	117	62	151	282490	0.24	13.57	0.23	0.5280	0.0065	0.72	0.18646	0.00220	2721	46	2733	27	2711	19	101
94	detrital	36	19	32	3301	0.18	13.46	0.24	0.5221	0.0066	0.70	0.18702	0.00239	2713	49	2708	28	2716	21	100
95	detrital	261	136	175	77609	0.13	13.32	0.22	0.5207	0.0064	0.74	0.18549	0.00207	2702	45	2702	27	2703	18	100
96	detrital	25	13	19	1160	0.16	13.56	0.26	0.5263	0.0068	0.68	0.18690	0.00261	2720	52	2726	29	2715	23	100
97	detrital	317	166	368	22988	0.23	13.44	0.22	0.5247	0.0064	0.74	0.18576	0.00208	2711	45	2719	27	2705	18	101
98	detrital	71	37	67	8532	0.19	13.62	0.23	0.5251	0.0065	0.72	0.18810	0.00223	2724	47	2721	27	2726	19	100
99	detrital	177	93	206	140680	0.22	13.55	0.23	0.5237	0.0064	0.73	0.18770	0.00213	2719	45	2715	27	2722	19	100
100	detrital	427	224	484	204035	0.22	13.46	0.23	0.5241	0.0065	0.72	0.18620	0.00221	2712	46	2717	27	2709	19	100
101	detrital	570	300	373	29137	0.13	13.69	0.23	0.5267	0.0064	0.74	0.18850	0.00210	2728	45	2728	27	2729	18	100
102	detrital	34	18	29	2937	0.17	13.83	0.26	0.5273	0.0068	0.68	0.19021	0.00265	2738	52	2730	29	2744	23	99
103	detrital	210	107	205	25597	0.17	13.15	0.22	0.5071	0.0062	0.73	0.18807	0.00213	2690	45	2644	27	2725	19	97
104	detrital	470	245	438	1118583	0.18	13.34	0.22	0.5215	0.0064	0.74	0.18547	0.00208	2704	45	2706	27	2702	18	100
105	detrital	28	15	19	1549	0.14	13.45	0.25	0.5248	0.0067	0.68	0.18595	0.00258	2712	51	2720	28	2707	23	100

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using ($^{207}Pb/^{206}Pb$)/($^{238}U/^{206}Pb$ * 1/137.88)

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

DC1516 Dyke in Skalkseput Lat. S deg S Min E deg E Min

29 30.9534 22 18.672 Laser Ablation high resolution ICPMS University of Stellenbosch

							RATIOS							AGES [Ma]						Conc.
Grain	**Age Domain**	**U [ppm][a]**	**Pb [ppm][a]**	**Th [ppm]**	**$^{206}Pb/^{204}Pb$**	**Th/U meas**	**$^{207}Pb/^{235}U$[b]**	**1 σ[d]**	**$^{206}Pb/^{238}U$[b]**	**1 σ[d]**	**rho[c]**	**$^{207}Pb/^{206}Pb$**	**1 σ[d]**	**$^{207}Pb/^{235}U$**	**1 σ[d]**	**$^{206}Pb/^{238}U$**	**1 σ[d]**	**$^{207}Pb/^{206}Pb$**	**1 σ[d]**	%
3	main	835	247	458	2200	0.55	7.53	0.13	0.296	0.004	0.76	0.1842	0.0021	2176	38	1673	20	2691	19	62
6	main	739	276	501	5856	0.68	9.42	0.17	0.373	0.005	0.76	0.1830	0.0021	2380	42	2045	23	2680	19	76
10	main	347	183	339	23503	0.98	13.58	0.25	0.527	0.007	0.73	0.1871	0.0024	2721	51	2727	30	2717	21	100
14	main	448	236	586	20840	1.31	13.68	0.24	0.526	0.007	0.76	0.1888	0.0022	2728	48	2723	30	2732	19	100
18d	core	59	31	49	3544	0.84	13.67	0.25	0.526	0.007	0.74	0.1887	0.0024	2727	50	2723	30	2731	20	100
22	main	945	398	3967	3147	4.20	10.60	0.19	0.421	0.006	0.76	0.1828	0.0021	2489	44	2263	26	2678	19	85
24	main	290	152	314	2922	1.08	13.58	0.24	0.525	0.007	0.75	0.1877	0.0022	2721	49	2719	30	2722	19	100
28	main	213	112	179	4715	0.84	13.68	0.25	0.527	0.007	0.74	0.1883	0.0023	2728	50	2730	30	2727	20	100
44	main	387	187	187	8919	0.48	12.53	0.22	0.485	0.007	0.76	0.1874	0.0022	2645	47	2548	28	2720	19	94
46	main	475	249	572	2326	1.20	13.73	0.24	0.526	0.007	0.76	0.1894	0.0022	2731	49	2723	30	2737	19	99
50	main	508	265	557	4334	1.10	13.40	0.24	0.523	0.007	0.76	0.1860	0.0022	2708	48	2710	30	2707	19	100
52	main	473	226	367	3586	0.78	12.21	0.22	0.479	0.006	0.75	0.1850	0.0022	2621	47	2521	28	2698	19	93
54	main	427	189	514	9504	1.20	11.24	0.20	0.443	0.006	0.75	0.1840	0.0022	2543	46	2364	27	2689	20	88
60a	main	1477	428	395	5258	0.27	7.49	0.14	0.290	0.004	0.75	0.1874	0.0023	2171	39	1641	20	2719	20	60
60b	main	1066	330	333	10866	0.31	7.94	0.14	0.310	0.004	0.75	0.1859	0.0022	2224	40	1740	21	2706	20	64
62	main	487	257	486	3858	1.00	13.65	0.25	0.527	0.007	0.75	0.1880	0.0023	2726	49	2728	30	2724	20	100
66	main	218	111	206	19398	0.95	13.19	0.24	0.508	0.007	0.74	0.1884	0.0023	2693	49	2647	29	2728	20	97
71a	main	513	270	1219	8808	2.37	13.53	0.25	0.526	0.007	0.74	0.1864	0.0023	2717	49	2726	30	2711	20	101
71b	main	279	147	301	16678	1.08	13.54	0.25	0.525	0.007	0.74	0.1870	0.0023	2718	50	2721	30	2716	20	100
78a	main	426	223	477	4988	1.12	13.48	0.25	0.523	0.007	0.74	0.1867	0.0023	2714	50	2714	30	2713	20	100
78b	main	384	202	375	2364	0.97	13.70	0.25	0.526	0.007	0.74	0.1889	0.0023	2729	50	2725	30	2733	20	100
79	main	352	160	249	1815	0.71	11.49	0.21	0.455	0.006	0.73	0.1834	0.0023	2564	48	2415	27	2683	21	90
81	main	222	87	175	2971	0.79	10.21	0.19	0.392	0.005	0.73	0.1888	0.0024	2454	46	2133	25	2732	21	78
83a	main	229	107	67	5226	0.29	12.01	0.22	0.469	0.006	0.73	0.1856	0.0024	2605	49	2481	28	2703	21	92
83b	main	371	156	219	2131	0.59	10.79	0.20	0.421	0.006	0.73	0.1856	0.0024	2505	47	2267	26	2704	21	84
90a	main	374	188	188	12692	0.50	13.01	0.24	0.503	0.007	0.73	0.1877	0.0024	2680	50	2626	29	2722	21	96
90b	main	520	273	535	43859	1.03	13.52	0.25	0.525	0.007	0.73	0.1869	0.0024	2716	51	2719	30	2715	21	100
90c	main	507	267	512	29388	1.01	13.46	0.25	0.526	0.007	0.72	0.1855	0.0024	2713	51	2727	30	2703	21	101
94	main	643	323	636	13510	0.99	12.96	0.25	0.503	0.007	0.72	0.1870	0.0025	2677	51	2625	30	2716	21	97
98a	main	277	146	197	4543	0.71	13.77	0.26	0.527	0.007	0.72	0.1896	0.0025	2734	52	2728	31	2739	22	100
98b	main	913	339	839	4002	0.92	9.47	0.18	0.372	0.005	0.72	0.1847	0.0025	2384	46	2038	24	2696	22	76
99	main	398	170	244	1246	0.61	11.05	0.22	0.427	0.006	0.69	0.1878	0.0027	2527	51	2292	27	2723	24	84
103	main	429	224	510	31124	1.19	13.27	0.25	0.521	0.007	0.72	0.1846	0.0025	2699	52	2705	30	2695	22	100
104	main	851	350	901	14593	1.06	10.48	0.20	0.411	0.006	0.71	0.1848	0.0025	2478	48	2221	26	2697	22	82

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using $(^{207}Pb/^{206}Pb)/(^{238}U/^{206}Pb * 1/137.88)$

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

DC1517 Franzenhof Granite Lat. S deg 29 S Min 37.6992 E deg 22 E Min 26.0472 Laser Ablation high resolution ICPMS University of Stellenbosch

							RATIOS							AGES [Ma]						Conc.
Grain	Age Domain	U [ppm][a]	Pb [ppm][a]	Th [ppm]	^{206}Pb/^{204}Pb	Th/U meas	^{207}Pb/^{235}U[b]	1 σ[d]	^{206}Pb/^{238}U[b]	1 σ[d]	rho[c]	^{207}Pb/^{206}Pb	1 σ[d]	^{207}Pb/^{235}U	1 σ[d]	^{206}Pb/^{238}U	1 σ[d]	^{207}Pb/^{206}Pb	1 σ[d]	%
5a	main	135	65	42	3296	0.31	13.95	0.26	0.478	0.006	0.74	0.2117	0.003	2747	51	2519	28	2918	20	86
5b	main	95	54	41	5812	0.43	16.62	0.29	0.571	0.008	0.77	0.2110	0.002	2913	51	2913	31	2913	18	100
10a	main	326	143	110	1186	0.34	12.85	0.22	0.438	0.006	0.78	0.2128	0.002	2669	45	2341	26	2927	17	80
10b	main	127	53	10	1050	0.08	12.32	0.35	0.414	0.007	0.58	0.2159	0.005	2629	74	2232	31	2950	36	76
22	main	123	70	13	12319	0.11	16.43	0.28	0.569	0.008	0.77	0.2095	0.002	2902	50	2903	31	2902	18	100
24	core xenocryst	37	23	10	16200	0.26	19.88	0.36	0.614	0.008	0.75	0.2349	0.003	3085	56	3085	33	3086	19	100
25	core xenocryst	142	112	24	12101	0.23	16.05	0.29	0.561	0.008	0.74	0.2081	0.003	2903	53	2882	32	2893	20	100
25a	main	119	68	10	10764	0.08	16.79	0.29	0.574	0.008	0.77	0.2122	0.002	2923	51	2924	31	2922	18	100
25d	main	134	77	12	10548	0.09	16.49	0.29	0.570	0.008	0.77	0.2099	0.002	2906	50	2907	31	2905	18	100
28a	core xenocryst	65	39	21	41844	0.32	18.83	0.33	0.601	0.008	0.76	0.2272	0.003	3033	54	3034	33	3032	19	100
28a	core xenocryst	130	109	20	12149	0.23	16.16	0.29	0.565	0.008	0.74	0.2080	0.003	2913	53	2901	32	2893	20	100
28b	main	502	171	128	424	0.25	9.78	0.17	0.340	0.005	0.76	0.2086	0.002	2414	42	1887	22	2894	18	65
28d	main	78	35	34	662	0.43	12.82	0.30	0.444	0.007	0.64	0.2092	0.004	2666	62	2370	30	2899	28	82
30a	core xenocryst	229	107	70	598	0.30	14.77	0.28	0.467	0.006	0.73	0.2294	0.003	2801	53	2471	28	3048	21	81
30b	main	243	136	81	16591	0.33	16.35	0.28	0.562	0.007	0.77	0.2108	0.002	2897	50	2876	31	2912	18	99
32	main	173	89	32	8258	0.18	15.06	0.26	0.517	0.007	0.77	0.2113	0.002	2819	49	2686	29	2916	18	92
33	main	824	376	80	2794	0.10	13.30	0.23	0.456	0.006	0.76	0.2115	0.002	2701	47	2422	27	2917	18	83
34	main	208	119	12	6071	0.06	16.70	0.29	0.571	0.008	0.77	0.2122	0.002	2918	50	2911	31	2923	18	100
36d	main	203	116	11	8095	0.05	16.72	0.29	0.572	0.008	0.77	0.2121	0.002	2919	51	2914	31	2922	18	100
39d	main	497	189	145	1975	0.29	10.49	0.19	0.381	0.005	0.75	0.1999	0.002	2479	45	2080	24	2825	20	74
39e	main	909	325	164	1189	0.18	10.42	0.18	0.358	0.005	0.77	0.2112	0.002	2473	43	1972	23	2915	18	68
40a	core xenocryst	825	237	142	701	0.17	8.40	0.15	0.287	0.004	0.75	0.2122	0.003	2276	41	1628	19	2922	19	56
40b	main	673	285	202	1673	0.30	12.28	0.22	0.423	0.006	0.76	0.2107	0.002	2626	46	2272	26	2911	18	78
46	main	673	171	404	413	0.60	6.96	0.13	0.254	0.003	0.74	0.1984	0.002	2106	39	1461	18	2813	20	52
48a	core xenocryst	508	214	166	606	0.33	13.24	0.24	0.421	0.006	0.75	0.2280	0.003	2697	49	2265	26	3038	19	75
48b	main	286	121	81	1276	0.28	12.31	0.22	0.421	0.006	0.76	0.2120	0.002	2629	47	2266	26	2921	19	78
50	main	887	267	301	1314	0.34	8.33	0.15	0.301	0.004	0.76	0.2005	0.002	2267	40	1698	20	2830	19	60
51	core xenocryst	191	99	109	34976	0.57	16.57	0.32	0.520	0.007	0.73	0.2311	0.003	2910	56	2699	31	3059	21	88
57d	core xenocryst	246	135	19	8503	0.08	16.20	0.29	0.549	0.007	0.76	0.2140	0.002	2889	51	2821	31	2936	18	96
58a	main	581	250	43	2979	0.07	12.55	0.23	0.431	0.006	0.74	0.2111	0.003	2647	49	2311	27	2914	20	79
58b	core xenocryst	207	89	198	1614	0.96	14.11	0.26	0.431	0.006	0.73	0.2375	0.003	2757	52	2309	27	3104	20	74
59d	main	325	166	12	1574	0.04	15.05	0.29	0.510	0.007	0.72	0.2139	0.003	2819	54	2658	30	2936	21	91
60	main	245	140	102	42071	0.42	16.49	0.29	0.571	0.008	0.76	0.2095	0.002	2906	52	2911	32	2902	19	100
62a	main	144	82	66	114589	0.46	16.51	0.30	0.568	0.008	0.76	0.2108	0.002	2907	52	2900	32	2912	19	100
62d	main	288	136	93	5270	0.32	13.53	0.24	0.473	0.006	0.76	0.2076	0.002	2717	48	2496	28	2887	19	86
65a	main	1400	336	477	3013	0.34	6.36	0.11	0.240	0.003	0.75	0.1920	0.002	2027	37	1388	17	2759	19	50
65b	main	948	444	292	3079	0.31	12.88	0.23	0.468	0.006	0.75	0.1995	0.002	2671	48	2476	28	2822	19	88
69	main	310	141	128	3702	0.41	13.33	0.25	0.454	0.006	0.73	0.2129	0.003	2704	51	2415	28	2927	21	82
71	main	2089	416	672	396	0.32	5.13	0.10	0.199	0.003	0.74	0.1871	0.002	1841	34	1169	15	2716	21	43
73	main	672	264	238	595	0.35	11.39	0.21	0.392	0.005	0.74	0.2106	0.003	2556	47	2134	25	2910	20	73
76	main	1818	291	682	15064	0.38	3.95	0.08	0.160	0.002	0.72	0.1790	0.002	1624	31	958	12	2644	22	36
81	main	150	72	51	8893	0.34	14.01	0.27	0.480	0.007	0.72	0.2116	0.003	2750	53	2527	29	2918	21	87
82a	main	330	148	199	3176	0.60	13.07	0.25	0.448	0.006	0.73	0.2116	0.003	2685	51	2387	27	2918	21	82
82b	main	223	127	136	4757	0.61	16.56	0.30	0.571	0.008	0.74	0.2104	0.003	2910	53	2911	32	2909	20	100
83	main	1712	442	609	2994	0.36	7.09	0.13	0.258	0.004	0.74	0.1992	0.003	2123	39	1481	18	2819	20	53
87a	main	99	57	20	2730	0.21	16.66	0.37	0.571	0.008	0.62	0.2115	0.004	2916	64	2913	32	2917	28	100
87d	main	59	27	14	1156	0.24	13.27	0.28	0.452	0.006	0.69	0.2129	0.003	2699	56	2405	29	2928	24	82
87b	main	278	141	108	11582	0.39	14.98	0.28	0.508	0.007	0.73	0.2137	0.003	2814	53	2650	30	2933	21	90
89d	core xenocryst	246	141	12	97906	0.05	16.92	0.31	0.571	0.008	0.74	0.2150	0.003	2930	54	2911	32	2944	20	99
90d	main	199	113	10	5087	0.05	16.65	0.32	0.568	0.008	0.72	0.2126	0.003	2915	56	2900	32	2925	22	99
92	main	444	186	112	2843	0.25	12.20	0.23	0.419	0.006	0.73	0.2112	0.003	2620	49	2256	26	2915	21	77

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); ^{207}Pb/^{235}U calculated using (^{207}Pb/^{206}Pb)/(^{238}U/^{206}Pb * 1/137.88)

[c]Rho is the error correlation defined as the quotient of the propagated errors of the ^{206}Pb/^{238}U and the ^{207}/^{235}U ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

DC1518 Ongers River Granite Lat. S deg S Min E deg E Min

30 8.5518 23 13.503 Laser Ablation high resolution ICPMS University of Stellenbosch

Grain	Age Domain	U [ppm][a]	Pb [ppm][a]	Th [ppm]	$^{206}Pb/^{204}Pb$	Th/U meas	RATIOS $^{207}Pb/^{235}U$[b]	1 σ[d]	$^{206}Pb/^{238}U$[b]	1 σ[d]	rho[c]	$^{207}Pb/^{206}Pb$[e]	1 σ[d]	AGES [Ma] $^{207}Pb/^{235}U$	1 σ[d]	$^{206}Pb/^{238}U$	1 σ[d]	$^{207}Pb/^{206}Pb$	1 σ[d]	Conc. %
2d	Core	219	125	110	11859	0.50	16.52	0.28	0.570	0.007	0.76	0.2102	0.0023	2907	49	2907	30	2907	18	100
7a	Main	285	137	58	1268	0.20	14.11	0.25	0.482	0.006	0.73	0.2125	0.0026	2757	50	2534	28	2925	20	87
7b	Main	549	259	208	11767	0.38	12.92	0.22	0.471	0.006	0.75	0.1991	0.0022	2674	46	2487	27	2818	18	88
7c	Main	490	150	111	719	0.23	8.69	0.15	0.306	0.004	0.74	0.2057	0.0024	2306	40	1722	20	2872	19	60
9a	Main	200	114	63	2854	0.32	16.68	0.28	0.570	0.007	0.76	0.2122	0.0024	2916	50	2907	30	2923	18	99
9b	Main	256	147	132	13358	0.51	16.84	0.28	0.573	0.007	0.76	0.2132	0.0023	2926	49	2920	30	2930	18	100
9c	Main	163	93	44	8604	0.27	16.56	0.28	0.570	0.007	0.76	0.2109	0.0023	2910	49	2907	30	2912	18	100
10	Main	272	155	39	61378	0.15	16.30	0.27	0.570	0.007	0.76	0.2074	0.0023	2895	49	2907	30	2886	17	101
11	Main	1024	407	672	13873	0.66	9.50	0.16	0.397	0.005	0.76	0.1734	0.0019	2387	40	2157	24	2590	18	83
12a	Main	267	142	153	5774	0.57	15.45	0.27	0.532	0.007	0.74	0.2106	0.0025	2843	50	2750	29	2910	19	94
12b	Main	401	186	542	447	1.35	13.50	0.26	0.464	0.006	0.70	0.2108	0.0029	2715	52	2459	28	2912	22	84
12c	Main	485	186	734	465	1.51	11.16	0.19	0.384	0.005	0.76	0.2110	0.0023	2537	43	2094	23	2913	18	72
14a	Main	708	248	185	960	0.26	9.20	0.16	0.350	0.005	0.75	0.1908	0.0022	2358	41	1933	22	2749	19	70
14b	Main	236	134	131	2820	0.56	16.45	0.29	0.569	0.007	0.75	0.2097	0.0024	2903	51	2904	30	2903	19	100
17	Main	287	129	229	2763	0.80	13.00	0.22	0.450	0.006	0.75	0.2094	0.0024	2680	46	2397	26	2901	18	83
18	Main	360	166	326	1518	0.91	13.61	0.24	0.461	0.006	0.74	0.2141	0.0025	2723	48	2444	27	2937	19	83
19	Main	169	92	94	1629	0.56	15.66	0.27	0.543	0.007	0.76	0.2093	0.0024	2856	49	2794	29	2900	18	96
20a	Main	190	102	52	2647	0.27	15.67	0.27	0.534	0.007	0.74	0.2129	0.0025	2857	50	2757	29	2928	19	94
20b	Main	347	149	31	3808	0.09	11.96	0.21	0.430	0.006	0.74	0.2018	0.0024	2601	46	2304	25	2841	20	81
20c	Main	462	120	76	2258	0.16	6.88	0.12	0.260	0.003	0.72	0.1920	0.0024	2097	38	1490	17	2760	20	54
22d	Core	224	127	126	12431	0.56	16.25	0.28	0.569	0.007	0.76	0.2070	0.0023	2891	49	2904	30	2882	18	101
23	Main	90	50	33	1217	0.36	16.22	0.33	0.557	0.007	0.66	0.2110	0.0032	2890	58	2856	30	2914	24	98
25a	Main	77	44	19	13588	0.25	16.46	0.29	0.569	0.007	0.74	0.2096	0.0025	2904	51	2905	31	2902	19	100
25d	Core	154	60	127	1018	0.82	11.26	0.21	0.390	0.005	0.71	0.2093	0.0027	2545	46	2125	24	2900	21	73
26a	Main	484	274	185	1270	0.38	16.51	0.28	0.568	0.007	0.76	0.2109	0.0024	2907	50	2898	30	2913	18	99
26b	Main	667	303	331	11245	0.50	11.73	0.20	0.455	0.006	0.75	0.1869	0.0021	2583	44	2419	26	2715	18	89
28d	Core	1043	241	1098	1138	1.05	5.27	0.09	0.231	0.003	0.74	0.1655	0.0019	1864	33	1339	16	2513	20	53
30	Main	247	140	169	6056	0.69	16.24	0.28	0.567	0.007	0.75	0.2077	0.0024	2891	50	2895	30	2888	18	100
31	Main	179	103	31	2585	0.17	16.59	0.29	0.575	0.007	0.75	0.2093	0.0024	2911	51	2927	30	2900	19	101
32	Main	454	237	76	7311	0.17	15.03	0.26	0.523	0.007	0.75	0.2084	0.0024	2817	49	2712	29	2893	18	94
33	Core	242	127	210	1907	0.87	15.36	0.28	0.527	0.007	0.73	0.2112	0.0026	2838	51	2730	29	2915	20	94
34	Main	75	43	36	17023	0.48	16.96	0.30	0.575	0.008	0.74	0.2139	0.0026	2932	52	2928	31	2935	19	100
35	Main	148	84	58	11768	0.39	16.84	0.30	0.571	0.007	0.74	0.2139	0.0026	2926	52	2911	31	2935	19	99
36	Main	134	77	50	33106	0.38	16.71	0.29	0.572	0.007	0.74	0.2120	0.0025	2918	51	2915	31	2921	19	100
40d	Core	310	158	128	2337	0.41	14.57	0.25	0.510	0.007	0.75	0.2073	0.0024	2788	48	2656	28	2885	18	92
40e	Core	153	85	42	10877	0.28	15.93	0.28	0.558	0.007	0.74	0.2072	0.0025	2873	51	2857	30	2884	19	99
40f	Core	507	265	339	3247	0.67	14.92	0.26	0.523	0.007	0.75	0.2068	0.0024	2810	49	2714	29	2880	19	94
41	Main	455	226	304	3166	0.67	14.36	0.26	0.497	0.007	0.73	0.2096	0.0026	2774	51	2600	28	2903	20	90
42	Main	271	154	141	34877	0.52	16.20	0.28	0.566	0.007	0.75	0.2075	0.0024	2889	51	2893	30	2886	19	100
45a	Main	144	82	56	4144	0.39	16.25	0.29	0.567	0.007	0.74	0.2077	0.0025	2891	52	2897	31	2887	19	100
45b	Main	331	175	70	13916	0.21	15.15	0.27	0.530	0.007	0.74	0.2073	0.0025	2825	50	2742	29	2885	19	95
45c	Main	505	210	71	3503	0.14	11.53	0.20	0.416	0.005	0.74	0.2009	0.0024	2567	45	2243	25	2834	19	79
46a	Main	552	259	107	6104	0.19	12.99	0.23	0.469	0.006	0.73	0.2009	0.0024	2679	48	2479	27	2834	19	87
46b	Main	411	193	165	10137	0.40	12.94	0.23	0.470	0.006	0.73	0.1998	0.0024	2675	48	2483	27	2824	20	88
53	Main	421	239	49	10300	0.12	16.36	0.29	0.569	0.007	0.73	0.2086	0.0025	2898	52	2903	31	2895	20	100
54	Main	358	193	193	10129	0.54	15.40	0.27	0.539	0.007	0.73	0.2072	0.0025	2840	51	2780	30	2884	20	96
55	Main	161	75	182	2454	1.13	13.32	0.24	0.469	0.006	0.73	0.2062	0.0025	2703	48	2478	27	2876	20	86
56d	Core	46	18	2	3810	0.05	11.03	0.24	0.381	0.005	0.61	0.2102	0.0036	2526	54	2080	23	2907	27	72
57a	Main	121	69	49	24700	0.40	16.47	0.30	0.569	0.007	0.73	0.2100	0.0026	2905	52	2903	31	2906	20	100
57d	Core	110	63	39	10792	0.35	16.65	0.30	0.571	0.008	0.73	0.2116	0.0026	2915	52	2910	31	2918	20	100
59	Main	212	114	63	9830	0.30	15.44	0.28	0.538	0.007	0.74	0.2081	0.0025	2843	51	2777	30	2891	19	96
61a	Main	194	97	194	3266	1.00	14.27	0.27	0.499	0.007	0.72	0.2075	0.0027	2768	52	2608	29	2886	21	90
61d	Core	300	152	319	1671	1.06	14.66	0.27	0.506	0.007	0.71	0.2102	0.0027	2794	52	2639	28	2907	21	91
61e	Core	619	287	240	468	0.39	13.43	0.25	0.463	0.006	0.73	0.2103	0.0026	2710	50	2453	27	2908	20	84
63a	Main	464	221	48	3099	0.10	13.67	0.25	0.475	0.006	0.73	0.2085	0.0026	2727	49	2507	27	2894	20	87
63b	Main	491	241	144	5931	0.29	14.22	0.26	0.490	0.006	0.72	0.2103	0.0027	2765	51	2572	28	2908	20	88

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using ($^{207}Pb/^{206}Pb$)/($^{238}U/^{206}Pb$ * 1/137.88)

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

DC1610 Draghoender Granite Lat. S deg S Min E deg E Min

30 8.5518 23 13.503 Laser Ablation high resolution ICPMS University of Stellenbosch

							RATIOS							**AGES [Ma]**						**Conc.**
grain	**Age domain**	**U [ppm][a]**	**Pb [ppm][a]**	**Th [ppm]**	**$^{206}Pb/^{204}Pb$**	**Th/U meas**	**$^{207}Pb/^{235}U^{b}$**	**1 σ[d]**	**$^{206}Pb/^{238}U^{b}$**	**1 σ[d]**	**rho[c]**	**$^{207}Pb/^{206}Pb^{e}$**	**1 σ[d]**	**$^{207}Pb/^{235}U$**	**1 σ**	**$^{206}Pb/^{238}U$**	**1 σ**	**$^{207}Pb/^{206}Pb$**	**1 σ**	%
3	main osc zoned	137	72	48	593	0.35	15.64	0.25	0.5293	0.0061	0.71	0.21427	0.00246	2855	46	2739	31	2938	19	93
7.1	main osc zoned	298	146	138	1613	0.46	14.50	0.23	0.4880	0.0056	0.71	0.21548	0.00244	2783	45	2562	29	2947	18	87
7.2	main osc zoned	335	120	72	1603	0.22	10.59	0.17	0.3593	0.0042	0.70	0.21385	0.00252	2488	41	1979	23	2935	19	67
8	main osc zoned	217	120	90	2112	0.42	16.41	0.26	0.5505	0.0063	0.71	0.21619	0.00246	2901	47	2827	32	2953	18	96
10	main osc zoned	235	136	92	2133	0.39	17.16	0.28	0.5774	0.0066	0.71	0.21559	0.00245	2944	47	2938	34	2948	18	100
11	main osc zoned	554	315	145	3544	0.26	16.73	0.27	0.5680	0.0065	0.71	0.21367	0.00241	2920	47	2899	33	2934	18	99
13	main osc zoned	188	108	52	1952	0.28	17.24	0.28	0.5764	0.0066	0.71	0.21693	0.00249	2948	48	2934	34	2958	19	99
16	main osc zoned	299	139	92	3383	0.31	13.80	0.25	0.4637	0.0056	0.66	0.21581	0.00300	2736	50	2456	30	2950	22	83
19	main osc zoned	152	77	34	2173	0.22	15.19	0.26	0.5095	0.0060	0.68	0.21627	0.00272	2827	49	2655	31	2953	20	90
20	main osc zoned	239	121	95	1774	0.40	14.93	0.24	0.5042	0.0058	0.71	0.21474	0.00248	2811	46	2632	30	2942	19	89
22	main osc zoned	214	123	96	2478	0.45	17.16	0.28	0.5741	0.0066	0.70	0.21682	0.00253	2944	48	2925	34	2957	19	99
26	main osc zoned	270	156	79	2395	0.29	17.23	0.28	0.5791	0.0067	0.70	0.21582	0.00251	2948	48	2945	34	2950	19	100
28	main osc zoned	230	133	101	3213	0.44	17.18	0.28	0.5788	0.0067	0.70	0.21529	0.00254	2945	49	2944	34	2946	19	100
48	main osc zoned	330	164	123	2536	0.37	14.82	0.25	0.4969	0.0058	0.69	0.21631	0.00261	2804	47	2601	30	2953	19	88
49	main osc zoned	266	124	95	2234	0.36	13.76	0.24	0.4643	0.0055	0.68	0.21487	0.00272	2733	47	2459	29	2943	20	84
50	main osc zoned	149	86	60	2213	0.40	17.11	0.30	0.5794	0.0068	0.68	0.21418	0.00275	2941	51	2946	35	2937	21	100
54	xenocryst	119	52	41	519	0.34	13.72	0.26	0.4381	0.0054	0.66	0.22708	0.00322	2730	51	2342	29	3032	23	77
57	main osc zoned	364	202	146	3670	0.40	16.53	0.28	0.5557	0.0064	0.69	0.21572	0.00261	2908	49	2849	33	2949	20	97
61	main osc zoned	131	73	26	869	0.20	16.34	0.30	0.5548	0.0065	0.63	0.21359	0.00304	2897	53	2845	33	2933	23	97
66	main osc zoned	114	66	46	1670	0.40	17.01	0.30	0.5783	0.0068	0.66	0.21331	0.00283	2935	52	2942	35	2931	21	100
69	main osc zoned	210	121	77	2733	0.37	17.18	0.29	0.5763	0.0067	0.68	0.21624	0.00270	2945	50	2933	34	2953	20	99
74.1	main osc zoned	282	163	130	3911	0.46	17.11	0.29	0.5771	0.0067	0.68	0.21497	0.00268	2941	50	2937	34	2943	20	100
74.2	main osc zoned	363	210	212	8050	0.59	17.06	0.29	0.5780	0.0067	0.68	0.21406	0.00268	2938	50	2941	34	2937	20	100
75	main osc zoned	220	127	79	3287	0.36	17.20	0.30	0.5754	0.0067	0.67	0.21679	0.00278	2946	51	2930	34	2957	21	99
79	main osc zoned	252	145	140	5055	0.56	17.12	0.30	0.5766	0.0067	0.67	0.21531	0.00275	2941	51	2935	34	2946	21	100
82	main osc zoned	80	43	16	1459	0.20	15.66	0.29	0.5330	0.0064	0.65	0.21308	0.00299	2856	53	2754	33	2929	23	94
83.1	main osc zoned	293	105	52	598	0.18	10.77	0.20	0.3582	0.0043	0.64	0.21803	0.00316	2503	47	1973	24	2966	23	67
83.2	main osc zoned	617	211	120	2897	0.19	10.08	0.18	0.3420	0.0040	0.66	0.21369	0.00284	2442	43	1896	22	2934	21	65
83.3	main osc zoned	345	184	46	5254	0.13	15.79	0.28	0.5323	0.0062	0.66	0.21509	0.00289	2864	51	2751	32	2944	22	93

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using ($^{207}Pb/^{206}Pb$)/($^{238}U/^{206}Pb$ * 1/137.88)

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

DC1611 Draghoender Granite Lat. S deg S Min E deg E Min

29 18.244 22 5.423 Laser Ablation high resolution ICPMS University of Stellenbosch

							RATIOS							AGES [Ma]						Conc.
Grain	Domain	U [ppm][a]	Pb [ppm][a]	Th [ppm]	$^{206}Pb/^{204}Pb$	Th/U meas	$^{207}Pb/^{235}U$[b]	1 σ[d]	$^{206}Pb/^{238}U$[b]	1 σ[d]	rho[c]	$^{207}Pb/^{206}Pb$	1 σ[d]	$^{207}Pb/^{235}U$	1 σ[d]	$^{206}Pb/^{238}U$	1 σ[d]	$^{207}Pb/^{206}Pb$	1 σ[d]	%
3	xenocryst	214	130	35	1887	0.16	19.35	0.31	0.607	0.007	0.72	0.2313	0.0026	3059	49	3057	35	3061	18	100
6	xenocryst	58	36	30	488	0.51	20.69	0.34	0.624	0.007	0.71	0.2404	0.0028	3124	52	3127	37	3123	19	100
7	CL-dark main	1061	467	13	6414	0.01	12.62	0.20	0.440	0.005	0.72	0.2081	0.0023	2652	42	2350	27	2890	18	81
15	CL-dark	498	287	34	7362	0.07	16.96	0.27	0.577	0.007	0.72	0.2131	0.0023	2932	47	2937	34	2929	18	100
15.2	xenocryst	244	128	15	2800	0.06	16.22	0.26	0.522	0.006	0.72	0.2253	0.0025	2890	46	2708	31	3019	18	90
18	xenocryst	98	61	42	1160	0.43	20.52	0.33	0.621	0.007	0.71	0.2397	0.0027	3116	51	3113	36	3118	18	100
22	CL-dark main	699	304	317	7449	0.45	12.83	0.20	0.435	0.005	0.72	0.2138	0.0024	2667	43	2329	27	2935	18	79
31	xenocryst	1116	562	844	14418	0.76	16.17	0.26	0.504	0.006	0.72	0.2326	0.0026	2887	46	2631	30	3070	18	86
33	CL-dark main	260	149	87	3502	0.34	17.20	0.28	0.576	0.007	0.71	0.2166	0.0025	2946	48	2932	34	2955	18	99
34	xenocryst	724	435	31	9764	0.04	18.74	0.30	0.600	0.007	0.72	0.2264	0.0025	3029	49	3031	35	3027	18	100
35	CL-dark main	539	312	126	7007	0.23	17.06	0.27	0.579	0.007	0.71	0.2138	0.0024	2938	47	2943	34	2934	18	100
37.1	CL-dark main	354	201	116	2392	0.33	16.89	0.28	0.568	0.007	0.71	0.2156	0.0025	2928	48	2900	34	2948	19	98
37.2	CL-dark main	660	263	241	3702	0.36	11.92	0.20	0.398	0.005	0.70	0.2171	0.0026	2598	43	2161	25	2959	19	73
46*	CL-dark main	514	216	123	2785	0.24	11.93	0.20	0.420	0.005	0.70	0.2058	0.0024	2599	42	2262	26	2873	19	79
49	CL-dark main	895	329	29	4859	0.03	10.77	0.18	0.368	0.004	0.70	0.2124	0.0025	2503	41	2018	23	2924	19	69
53	CL-dark main	491	253	2	10305	0.00	15.10	0.25	0.515	0.006	0.70	0.2127	0.0025	2822	46	2677	31	2926	19	91
57	CL-dark main	501	254	137	6648	0.27	14.95	0.25	0.507	0.006	0.70	0.2138	0.0025	2812	46	2644	31	2934	19	90
61	CL-dark main	726	404	185	8156	0.25	16.47	0.27	0.556	0.006	0.69	0.2147	0.0026	2904	48	2851	33	2942	19	97
64	xenocryst	731	342	335	7390	0.46	15.06	0.25	0.468	0.005	0.70	0.2332	0.0028	2819	46	2476	28	3074	19	81
67	CL-dark main	729	406	8	9988	0.01	16.15	0.27	0.556	0.006	0.70	0.2107	0.0025	2886	47	2850	33	2911	19	98
68	CL-dark main	475	267	178	5691	0.38	16.73	0.28	0.562	0.006	0.69	0.2158	0.0026	2920	48	2877	33	2949	19	98
72	xenocryst	473	289	192	9140	0.41	19.64	0.33	0.611	0.007	0.69	0.2330	0.0028	3074	51	3075	35	3073	19	100
76	CL-dark main	540	208	143	4727	0.26	11.46	0.19	0.386	0.004	0.68	0.2155	0.0027	2561	43	2102	24	2947	20	71
78	CL-dark main	563	258	7	4054	0.01	13.49	0.23	0.459	0.005	0.68	0.2134	0.0027	2715	47	2433	28	2931	20	83
83	CL-dark main	721	425	6	13351	0.01	17.17	0.29	0.589	0.007	0.68	0.2115	0.0026	2945	50	2985	35	2917	20	102
85	CL-dark main	401	214	88	7065	0.22	15.67	0.26	0.534	0.006	0.68	0.2129	0.0026	2857	48	2757	32	2928	20	94
86.1	CL-dark main	532	308	166	9372	0.31	16.92	0.29	0.579	0.007	0.68	0.2120	0.0026	2930	49	2944	34	2921	20	101
86.2	CL-dark main	804	447	14	15217	0.02	15.97	0.27	0.556	0.006	0.68	0.2085	0.0026	2875	49	2849	33	2894	20	98

* not used in regression

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using ($^{207}Pb/^{206}Pb$)/($^{238}U/^{206}Pb$ * 1/137.88)

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

DC1612	Skalkseput Granite	Lat. S deg	S Min	E deg	E Min		
		29	19.729	22	12.508	Laser Ablation high resolution ICPMS	University of Stellenbosch

							RATIOS							AGES [Ma]						Conc.
grain	age domain	U [ppm][a]	Pb [ppm][a]	Th [ppm]	$^{206}Pb/^{204}Pb$	Th/U meas	$^{207}Pb/^{235}U$[b]	1 σ[d]	$^{206}Pb/^{238}U$[b]	1 σ[d]	rho[c]	$^{207}Pb/^{206}Pb$[e]	1 σ[d]	$^{207}Pb/^{235}U$	1 σ[d]	$^{206}Pb/^{238}U$	1 σ[d]	$^{207}Pb/^{206}Pb$	1 σ[d]	%
3	core	43	24	26	198	0.61	15.76	0.31	0.552	0.007	0.61	0.2069	0.0032	2862	56	2835	34	2881	25	98
4	core	89	47	79	839	0.88	15.02	0.25	0.521	0.006	0.71	0.2091	0.0024	2817	46	2704	32	2899	19	93
5.1	main	184	105	93	2097	0.50	16.48	0.26	0.571	0.007	0.73	0.2092	0.0023	2905	46	2914	34	2899	18	101
5.2	main	382	172	285	1010	0.75	13.03	0.21	0.450	0.005	0.73	0.2098	0.0023	2682	43	2397	28	2904	18	83
8	main	204	114	47	3268	0.23	16.13	0.26	0.562	0.007	0.73	0.2083	0.0023	2885	46	2873	33	2893	18	99
11	core	49	28	27	1596	0.55	16.41	0.27	0.571	0.007	0.70	0.2083	0.0025	2901	49	2913	34	2892	19	101
15	core	63	23	25	625	0.40	10.52	0.18	0.368	0.004	0.70	0.2071	0.0025	2482	41	2022	24	2883	19	70
16	core	101	56	89	2073	0.88	16.01	0.26	0.557	0.007	0.72	0.2086	0.0024	2877	47	2853	33	2895	18	99
17	core	149	36	168	752	1.12	6.93	0.11	0.240	0.003	0.71	0.2094	0.0024	2103	34	1387	16	2901	19	48
19	main	304	172	97	5059	0.32	16.21	0.26	0.566	0.007	0.73	0.2076	0.0023	2889	46	2893	34	2887	18	100
20	core	30	17	17	340	0.56	16.46	0.29	0.569	0.007	0.69	0.2099	0.0027	2904	51	2902	35	2905	20	100
21	core	56	32	32	1207	0.58	16.48	0.27	0.569	0.007	0.71	0.2101	0.0025	2905	48	2904	34	2906	19	100
22	core	84	48	45	2435	0.53	16.57	0.27	0.571	0.007	0.72	0.2103	0.0024	2910	48	2914	34	2907	19	100
25	main	256	117	164	1121	0.64	13.30	0.22	0.456	0.005	0.71	0.2116	0.0024	2701	44	2422	28	2917	19	83
28.1	main	548	153	351	697	0.64	8.04	0.13	0.278	0.003	0.72	0.2094	0.0024	2235	37	1584	19	2901	18	55
28.2	main	288	85	195	1131	0.68	8.52	0.14	0.295	0.003	0.72	0.2093	0.0024	2288	37	1667	19	2900	18	57
29	main	186	99	170	1453	0.91	15.07	0.24	0.530	0.006	0.72	0.2063	0.0023	2820	46	2741	32	2876	18	95
30	main	262	150	129	5740	0.49	16.44	0.27	0.574	0.007	0.72	0.2076	0.0023	2903	47	2926	34	2887	18	101
32	core	84	46	40	1572	0.47	16.03	0.27	0.551	0.006	0.71	0.2110	0.0025	2878	48	2829	33	2913	19	97
33	core	108	60	96	1289	0.89	16.24	0.27	0.558	0.007	0.71	0.2113	0.0024	2891	48	2857	34	2915	19	98
35.1	core	59	32	44	1195	0.75	15.80	0.27	0.547	0.006	0.70	0.2096	0.0025	2865	48	2812	33	2903	20	97
35.2	core	96	29	238	647	2.49	8.74	0.15	0.302	0.004	0.70	0.2102	0.0026	2311	39	1699	20	2907	20	58
37	core	43	24	23	888	0.54	16.38	0.28	0.568	0.007	0.70	0.2091	0.0026	2899	50	2900	35	2899	20	100
39	core	64	37	65	1095	1.01	16.35	0.28	0.570	0.007	0.71	0.2080	0.0025	2898	49	2908	35	2890	19	101
40	core	40	22	26	762	0.67	16.20	0.28	0.567	0.007	0.69	0.2073	0.0026	2888	50	2895	35	2884	20	100
41	core	152	87	55	2736	0.36	16.39	0.27	0.569	0.007	0.71	0.2089	0.0025	2900	48	2905	34	2897	19	100
43	core	105	47	91	1196	0.87	12.82	0.22	0.442	0.005	0.70	0.2103	0.0025	2667	45	2360	28	2908	19	81
44	core	36	17	13	373	0.37	13.69	0.25	0.470	0.006	0.65	0.2112	0.0029	2728	50	2484	30	2915	22	85
45	core	79	35	38	993	0.48	12.67	0.22	0.437	0.005	0.69	0.2101	0.0026	2655	45	2339	28	2907	20	80
46.1	main	168	84	97	1896	0.58	14.53	0.24	0.501	0.006	0.70	0.2103	0.0025	2785	47	2619	31	2907	19	90
46.2	main	146	83	70	3023	0.48	16.38	0.28	0.570	0.007	0.70	0.2084	0.0025	2899	49	2909	34	2893	20	101
46.3	main	76	43	32	1728	0.42	16.47	0.28	0.569	0.007	0.69	0.2098	0.0026	2905	50	2906	34	2904	20	100
46.4	main	125	71	72	1929	0.57	16.26	0.27	0.564	0.007	0.70	0.2090	0.0025	2892	49	2884	34	2898	20	100
47.1	main	26	15	12	433	0.47	16.35	0.31	0.569	0.007	0.65	0.2086	0.0030	2898	55	2902	35	2895	23	100
47.2	main	50	28	26	1546	0.52	16.23	0.28	0.569	0.007	0.68	0.2067	0.0026	2891	51	2905	35	2880	21	101

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using $(^{207}Pb/^{206}Pb)/(^{238}U/^{206}Pb * 1/137.88)$

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

DC1612 Skalkseput Granite | Lat. S deg 29 | S Min 18.328 | E deg 22 | E Min 13.479

Classified as Draghoender type | Laser Ablation high resolution ICPMS | University of Stellenbosch

							RATIOS							AGES [Ma]						Conc.
Grain	Age Domain	U [ppm][a]	Pb [ppm][a]	Th [ppm]	$^{206}Pb/^{204}Pb$	Th/U meas	$^{207}Pb/^{235}U^{b}$	1 σ^{d}	$^{206}Pb/^{238}U^{b}$	1 σ^{d}	rho[c]	$^{207}Pb/^{206}Pb^{e}$	1 σ^{d}	$^{207}Pb/^{235}U$	1 σ^{d}	$^{206}Pb/^{238}U$	1 σ^{d}	$^{207}Pb/^{206}Pb$	1 σ^{d}	%
1	main	1745	387	369	796	0.21	5.64	0.09	0.222	0.003	0.73	0.1846	0.0020	1922	31	1290	15	2695	18	48
2.1	main	543	309	426	3016	0.79	16.77	0.27	0.569	0.007	0.72	0.2137	0.0024	2922	48	2905	34	2934	18	99
2.2	main	381	217	375	12028	0.98	16.52	0.27	0.570	0.007	0.72	0.2104	0.0024	2907	47	2906	34	2908	18	100
4	main	905	396	77	1678	0.09	12.93	0.21	0.437	0.005	0.72	0.2144	0.0024	2675	43	2339	27	2939	18	80
5	main	367	181	102	4684	0.28	14.26	0.23	0.493	0.006	0.72	0.2097	0.0024	2767	45	2585	30	2903	19	89
7.1	main	143	78	75	2353	0.52	15.89	0.26	0.544	0.006	0.73	0.2120	0.0024	2870	46	2799	33	2921	18	96
7.2	main	61	34	24	1065	0.39	16.28	0.28	0.558	0.007	0.69	0.2117	0.0026	2893	50	2857	34	2918	20	97.9
7.3	main	118	68	50	1499	0.42	16.70	0.29	0.571	0.007	0.69	0.2122	0.0026	2918	50	2910	34	2923	20	100
8.1	xenocryst	73	43	11	1545	0.16	18.26	0.30	0.594	0.007	0.72	0.2231	0.0026	3004	50	3004	36	3003	18	100
8.2	main	751	331	64	1119	0.09	12.02	0.19	0.441	0.005	0.73	0.1978	0.0022	2606	42	2354	28	2808	18	84
10	main	752	327	70	963	0.09	12.78	0.22	0.435	0.005	0.68	0.2131	0.0027	2664	46	2329	27	2929	20	80
14.1	main	628	327	82	2541	0.13	15.03	0.24	0.521	0.006	0.73	0.2091	0.0023	2817	45	2704	32	2898	18	93
14.2	main	684	249	53	1162	0.08	8.46	0.14	0.364	0.004	0.73	0.1686	0.0019	2281	37	1999	23	2544	19	79
15	xenocryst	130	78	70	2017	0.54	19.59	0.32	0.596	0.007	0.72	0.2383	0.0027	3072	50	3015	36	3109	18	97
17	xenocryst	275	149	180	2143	0.65	17.89	0.30	0.541	0.006	0.70	0.2400	0.0029	2984	50	2786	33	3120	19	89
18	main	270	92	187	757	0.69	10.55	0.18	0.341	0.004	0.69	0.2247	0.0029	2484	43	1889	23	3014	20	63
19	main	852	388	85	1878	0.10	13.20	0.22	0.456	0.005	0.72	0.2100	0.0024	2694	45	2421	29	2905	19	83
22.1	main	1251	397	449	5703	0.36	8.00	0.13	0.317	0.004	0.72	0.1830	0.0021	2231	37	1776	21	2680	19	66
22.2	main	704	402	201	3590	0.29	16.59	0.27	0.570	0.007	0.72	0.2109	0.0024	2911	48	2910	34	2913	18	100
25	xenocryst	404	241	96	529	0.24	18.47	0.31	0.597	0.007	0.71	0.2242	0.0026	3014	51	3020	36	3011	19	100
27.1	xenocryst	191	46	23	134	0.12	9.50	0.18	0.242	0.003	0.66	0.2848	0.0042	2387	46	1396	18	3390	23	41
27.2	main	962	478	71	1538	0.07	14.39	0.24	0.497	0.006	0.72	0.2101	0.0024	2776	46	2600	31	2906	19	89
29	main	459	231	34	1458	0.07	14.63	0.24	0.504	0.006	0.71	0.2105	0.0025	2792	47	2632	31	2909	19	90
35	main	1201	386	116	1791	0.10	7.54	0.13	0.321	0.004	0.71	0.1703	0.0020	2178	37	1796	21	2560	20	70
37	main	1512	514	90	5294	0.06	8.17	0.14	0.340	0.004	0.71	0.1742	0.0021	2250	38	1888	23	2598	20	73
38	main	1002	513	286	838	0.29	14.89	0.25	0.512	0.006	0.71	0.2109	0.0025	2808	48	2665	32	2913	19	92
39.1	main	1445	303	35	1093	0.02	3.99	0.07	0.210	0.003	0.69	0.1382	0.0017	1633	28	1227	15	2204	22	56
39.2	main	840	413	65	1621	0.08	14.22	0.24	0.492	0.006	0.70	0.2097	0.0026	2764	47	2578	31	2903	20	89

[a]U and Pb concentrations and Th/U ratios are calculated relative to GJ-1 reference zircon

[b]Corrected for background and within-run Pb/U fractionation and normalised to reference zircon GJ-1 (ID-TIMS values/measured value); $^{207}Pb/^{235}U$ calculated using ($^{207}Pb/^{206}Pb$)/($^{238}U/^{206}Pb$ * 1/137.88)

[c]Rho is the error correlation defined as the quotient of the propagated errors of the $^{206}Pb/^{238}U$ and the $^{207}/^{235}U$ ratio

[d]Quadratic addition of within-run errors (2 SD) and daily reproducibility of GJ-1 (2 SD)

[e]Corrected for mass-bias by normalising to GJ-1 reference zircon (~0.6 per atomic mass unit) and common Pb using the model Pb composition of Stacey & Kramers (1975)

Appendix A3 Lu-Hf data on zircons

Sample	Taken as - Type	Grain	Comment	Age (Ma)	1σ	$^{176}Hf/^{177}Hf$	1σ	$^{176}Lu/^{177}Hf$	1σ	$^{176}Yb/^{177}Hf$	1σ	t		177/176t	2s	eHf(t)	2σ	tDM	2σ	Crustal Residence ages Ga $^{176}Lu/^{177}Hf$ protolith 0.015	0.022
DC01121	Steenkop mylonite	1		2720	13	0.280949	0.000013	0.000836	0.000013	0.04687	0.00180	2.72	0.013	0.280905449	0.000026	-4.6	0.9	3.15	0.02	3.41	3.69
DC01121	Steenkop mylonite	2		2720	13	0.280995	0.000007	0.001079	0.000006	0.04995	0.00200	2.72	0.013	0.280938791	0.000014	-3.4	0.5	3.11	0.01	3.34	3.59
DC01121	Steenkop mylonite	3		2720	13	0.281004	0.000012	0.001276	0.000017	0.02851	0.00110	2.72	0.013	0.280937528	0.000024	-3.5	0.8	3.12	0.01	3.34	3.60
DC01121	Steenkop mylonite	9		2720	13	0.280987	0.000009	0.001090	0.000012	0.03606	0.00069	2.72	0.013	0.280930218	0.000018	-3.7	0.6	3.12	0.01	3.36	3.62
DC01121	Steenkop mylonite	10		2720	13	0.280979	0.000007	0.001416	0.000020	0.04187	0.00130	2.72	0.013	0.280905235	0.000014	-4.6	0.4	3.16	0.01	3.41	3.69
DC01121	Steenkop mylonite	12		2720	13	0.281009	0.000013	0.001909	0.000068	0.05493	0.00280	2.72	0.013	0.280909553	0.000026	-4.5	0.7	3.16	0.01	3.40	3.68
DC01121	Steenkop mylonite	33		2720	13	0.280964	0.000010	0.001336	0.000047	0.02874	0.00050	2.72	0.013	0.280894403	0.000020	-5.0	0.5	3.17	0.01	3.43	3.73
DC01121	Steenkop mylonite	34		2720	13	0.281011	0.000013	0.001286	0.000010	0.06666	0.00380	2.72	0.013	0.280944007	0.000026	-3.2	0.9	3.11	0.02	3.33	3.58
DC01121	Steenkop my.xenoxt.	4	xenocryst	2850	29	0.280949	0.000015	0.001734	0.000100	0.04046	0.00077	2.85	0.029	0.280854236	0.000030	-3.4	0.7	3.23	0.01	3.44	3.68
DC01121	Steenkop my.xenoxt.	7	xenocryst	2859	24	0.281005	0.000009	0.001473	0.000059	0.05210	0.00120	2.859	0.024	0.280924239	0.000018	-0.7	0.4	3.13	0.01	3.28	3.46
DC01121	Steenkop my.xenoxt.	20	metamorphic?	2126	16	0.281008	0.000010	0.000893	0.000096	0.02262	0.00080	2.126	0.016	0.280971842	0.000020	-16.1	0.4	3.08	0.01	3.64	4.25
DC01121	Steenkop my.xenoxt.	35	xenocryst	2809	27	0.281007	0.000010	0.001292	0.000025	0.03483	0.00073	2.809	0.027	0.280937434	0.000020	-1.4	0.6	3.11	0.01	3.29	3.48
DC01130	Skalkseput - Skp	2		2884	23	0.281021	0.000011	0.001790	0.000084	0.03229	0.00100	2.884	0.023	0.280921977	0.000022	-0.2	0.5	3.13	0.01	3.27	3.43
DC01130	Skalkseput - Skp	4	omitted from mean	2884	23	0.280916	0.000009	0.002693	0.000063	0.03854	0.00200	2.884	0.023	0.280767023	0.000018	-5.7	0.4	3.36	0.01	3.60	3.89
DC01130	Skalkseput - Skp	7	omitted from mean	2884	23	0.280882	0.000022	0.002946	0.000150	0.03455	0.00053	2.884	0.023	0.280719	0.000044	-7.4	1.0	3.43	0.02	3.70	4.04
DC01130	Skalkseput - Skp	3		2884	23	0.280974	0.000011	0.001090	0.000036	0.05133	0.00170	2.884	0.023	0.280913701	0.000022	-0.4	0.6	3.14	0.01	3.29	3.46
DC01130	Skalkseput - Skp	11	xenoxt omitted	2884	23	0.280933	0.000014	0.002455	0.000170	0.03571	0.00100	2.884	0.023	0.280797189	0.000028	-4.6	0.3	3.31	0.00	3.54	3.80
DC01130	Skalkseput - Skp	13		2884	23	0.281003	0.000008	0.001945	0.000036	0.03409	0.00170	2.884	0.023	0.280895402	0.000016	-1.1	0.4	3.17	0.01	3.33	3.51
DC01120	Steenkop type locality	1		2720	6	0.280995	0.000012	0.000635	0.000009	0.02848	0.00072	2.72	0.006	0.28096192	0.000024	-2.6	0.8	3.08	0.02	3.29	3.53
DC01120	Steenkop type locality	6		2720	6	0.280989	0.000009	0.001332	0.000010	0.04370	0.00190	2.72	0.006	0.280919611	0.000018	-4.1	0.6	3.14	0.01	3.38	3.65
DC01120	Steenkop type locality	8		2720	6	0.280988	0.000011	0.000744	0.000012	0.02961	0.00110	2.72	0.006	0.280949242	0.000022	-3.0	0.7	3.09	0.01	3.32	3.56
DC01120	Steenkop type locality	4		2720	6	0.280990	0.000010	0.000808	0.000003	0.01858	0.00067	2.72	0.006	0.280947908	0.000020	-3.1	0.7	3.10	0.01	3.32	3.57
DC01120	Steenkop type locality	9		2720	6	0.280997	0.000013	0.000692	0.000013	0.02440	0.00140	2.72	0.006	0.280960951	0.000026	-2.6	0.9	3.08	0.02	3.29	3.53
DC01120	Steenkop type locality	10		2720	6	0.280963	0.000011	0.000910	0.000003	0.03534	0.00210	2.72	0.006	0.280915595	0.000022	-4.2	0.8	3.14	0.01	3.39	3.66
DC01120	Steenkop type locality	15	omitted from mean	2720	6	0.280983	0.000009	0.001234	0.000031	2.02254	0.00054	2.72	0.006	0.280918716	0.000018	-4.1	0.5	3.14	0.01	3.38	3.65
DC01120	Steenkop type locality	14		2720	6	0.280976	0.000011	0.002240	0.000056	0.02449	0.00070	2.72	0.006	0.28085931	0.000022	-6.2	0.6	3.23	0.01	3.51	3.83
DC01120	Steenkop type locality	13		2720	6	0.280951	0.000011	0.002050	0.000190	0.02516	0.00049	2.72	0.006	0.280844207	0.000022	-6.8	0.1	3.25	0.00	3.54	3.88
DC01120	Steenkop type locality	16		2720	6	0.280971	0.000013	0.001589	0.000033	0.02828	0.00094	2.72	0.006	0.280888223	0.000026	-5.2	0.8	3.19	0.01	3.45	3.75
DC01120	Steenkop type locality	20		2720	6	0.281022	0.000012	0.000531	0.000004	0.02484	0.00064	2.72	0.006	0.280994338	0.000024	-1.4	0.8	3.03	0.02	3.22	3.43
DC01120	Steenkop type locality	22		2720	6	0.280964	0.000014	0.000655	0.000005	0.04031	0.00049	2.72	0.006	0.280929878	0.000028	-3.7	1.0	3.12	0.02	3.36	3.62
DC01120	Steenkop type locality	27		2720	6	0.280971	0.000012	0.001074	0.000003	0.02472	0.00026	2.72	0.006	0.280915051	0.000024	-4.3	0.8	3.14	0.02	3.39	3.67
DC01120	Steenkop type locality	29		2720	6	0.280973	0.000011	0.000944	0.000027	0.05533	0.00110	2.72	0.006	0.280923823	0.000022	-3.9	0.7	3.13	0.01	3.37	3.64
DC01120	Steenkop type locality	26		2720	6	0.280986	0.000010	0.001033	0.000016	0.03143	0.00091	2.72	0.006	0.280932187	0.000020	-3.6	0.7	3.12	0.01	3.35	3.61
DC1510	Draghoender-Drag.	24		2940	6	0.281022	0.000015	0.001093	0.000055	0.04605	0.00280	2.94	0.006	0.280960344	0.000030	2.5	0.8	3.08	0.02	3.16	3.25
DC1510	Draghoender-Drag.	44		2940	6	0.281088	0.000010	0.001303	0.000070	0.05575	0.00530	2.94	0.006	0.281014479	0.000019	4.5	0.4	3.00	0.01	3.04	3.08
DC1510	Draghoender-Drag.	46		2940	6	0.280975	0.000012	0.001120	0.000063	0.05015	0.00330	2.94	0.006	0.280911781	0.000024	0.8	0.6	3.14	0.01	3.26	3.39
DC1510	Draghoender-Drag.	36		2940	6	0.280958	0.000011	0.001043	0.000058	0.04642	0.00280	2.94	0.006	0.280899145	0.000022	0.4	0.6	3.16	0.01	3.29	3.43
DC1514	Draghoender-Drag.	1	date assumed	2910	10	0.281055	0.000011	0.001382	0.000052	0.04593	0.00120	2.91	0.01	0.280977815	0.000022	2.4	0.6	3.05	0.01	3.14	3.23
DC1514	Draghoender-Drag.	3	date assumed	2910	10	0.281087	0.000011	0.001304	0.000063	0.04952	0.00190	2.91	0.01	0.281014182	0.000022	3.7	0.5	3.01	0.01	3.06	3.12
DC1514	Draghoender-Drag.	12	date assumed	2910	10	0.281099	0.000014	0.001299	0.000021	0.06154	0.00240	2.91	0.01	0.281026475	0.000028	4.2	0.9	2.99	0.02	3.03	3.09
DC1514	Draghoender-Drag.	10	date assumed	2910	10	0.281033	0.000011	0.001100	0.000028	0.04527	0.00150	2.91	0.01	0.280971584	0.000022	2.2	0.7	3.06	0.01	3.15	3.25
DC1516	Dyke in Skalkseput	24		2720	11	0.281098	0.000025	0.001498	0.000072	0.06622	0.00300	2.72	0.011	0.281019944	0.000050	-0.5	1.5	3.01	0.03	3.17	3.35
DC1516	Dyke in Skalkseput	44		2720	11	0.281166	0.000019	0.002191	0.000180	0.10416	0.00890	2.72	0.011	0.281051865	0.000038	0.6	0.7	2.97	0.01	3.10	3.26
DC1516	Dyke in Skalkseput	54		2720	11	0.281211	0.000016	0.003610	0.000210	0.17884	0.01300	2.72	0.011	0.281022937	0.000032	-0.4	0.4	3.02	0.01	3.16	3.34
DC1516	Dyke in Skalkseput	60		2720	11	0.281071	0.000017	0.002193	0.000031	0.10780	0.00210	2.72	0.011	0.28095678	0.000034	-2.8	1.1	3.10	0.02	3.30	3.54
DC1516	Dyke in Skalkseput	90		2720	11	0.281186	0.000014	0.003001	0.000210	0.14465	0.01000	2.72	0.011	0.281029672	0.000028	-0.2	0.2	3.00	0.00	3.15	3.32
DC1512	Skalkseput-Skp	34		2905	8	0.281020	0.000017	0.001504	0.000064	0.05814	0.00130	2.905	0.008	0.280936184	0.000034	0.8	1.0	3.11	0.02	3.23	3.36
DC1512	Skalkseput-Skp	36		2905	8	0.281029	0.000009	0.000906	0.000037	0.03875	0.00099	2.905	0.008	0.280978528	0.000018	2.4	0.5	3.05	0.01	3.14	3.24
DC1512	Skalkseput-Skp	40		2905	8	0.281052	0.000015	0.001096	0.000060	0.05038	0.00220	2.905	0.008	0.280990904	0.000030	2.8	0.8	3.04	0.02	3.11	3.20
DC1512	Skalkseput-Skp	58		2905	8	0.281070	0.000008	0.001458	0.000067	0.05525	0.00130	2.905	0.008	0.280988753	0.000016	2.7	0.3	3.04	0.01	3.12	3.21
DC1517	Franzenhof-Draghoender	28		2910	9	0.280902	0.000013	0.001026	0.000067	0.04549	0.00280	2.91	0.009	0.280844713	0.000026	-2.3	0.7	3.23	0.01	3.42	3.63
DC1517	Franzenhof-Draghoender	32		2910	9	0.281053	0.000016	0.001446	0.000094	0.04809	0.00330	2.91	0.009	0.280972252	0.000032	2.3	0.8	3.06	0.01	3.15	3.25
DC1517	Franzenhof-Draghoender	33		2910	9	0.281044	0.000018	0.002091	0.000200	0.09436	0.00910	2.91	0.009	0.280927241	0.000036	0.6	0.5	3.13	0.01	3.24	3.38
DC1517	Franzenhof-Draghoender	58		2910	9	0.281059	0.000012	0.000902	0.000027	0.04307	0.00086	2.91	0.009	0.281008636	0.000024	3.5	0.7	3.01	0.01	3.07	3.14
DC1518	Maritzdam-Skalkseput	7		2906	7	0.281026	0.000016	0.000445	0.000020	0.01914	0.00085	2.906	0.007	0.281001165	0.000032	3.2	1.1	3.02	0.02	3.09	3.17
DC1518	Maritzdam-Skalkseput	9		2906	7	0.280939	0.000015	0.000371	0.000033	0.01562	0.00130	2.906	0.007	0.28091831	0.000030	0.2	0.9	3.13	0.02	3.27	3.42
DC1518	Maritzdam-Skalkseput	10		2906	7	0.280980	0.000013	0.000932	0.000025	0.04214	0.00089	2.906	0.007	0.280928051	0.000026	0.6	0.8	3.12	0.02	3.25	3.39
DC1518	Maritzdam-Skalkseput	18		2906	7	0.280978	0.000018	0.000602	0.000035	0.02694	0.00130	2.906	0.007	0.280944438	0.000036	1.2	1.1	3.10	0.02	3.21	3.34
DC1513	Skalkseput-Skp	14		2909	12	0.281077	0.000014	0.001673	0.000130	0.06500	0.00410	2.909	0.012	0.280983642	0.000028	2.6	0.5	3.05	0.01	3.13	3.22
DC1513	Skalkseput-Skp	13		2909	12	0.281010	0.000016	0.001142	0.000031	0.03644	0.00058	2.909	0.012	0.280946273	0.000032	1.3	1.0	3.10	0.02	3.20	3.33
DC1513	Skalkseput-Skp	18		2909	12	0.281044	0.000020	0.000807	0.000012	0.02596	0.00030	2.909	0.012	0.280998945	0.000040	3.2	1.4	3.02	0.03	3.09	3.17
DC1513	Skalkseput-Skp	22		2909	12	0.281025	0.000011	0.001143	0.000019	0.05235	0.00130	2.909	0.012	0.280961218	0.000022	1.8	0.7	3.08	0.01	3.17	3.28
DC1515	Conglomerate-Zeekoebaard	3		2720	4	0.281134	0.000013	0.002479	0.000053	0.11449	0.00350	2.72	0.004	0.281004847	0.000026	-1.1	0.7	3.03	0.01	3.20	3.40
DC1515	Conglomerate-Zeekoebaard	6		2720	4	0.281024	0.000015	0.000849	0.000021	0.03882	0.00086	2.72	0.004	0.280979786	0.000030	-2.0	1.0	3.05	0.02	3.25	3.47
DC1515	Conglomerate-Zeekoebaard	14		2720	4	0.281060	0.000016	0.000858	0.000032	0.03950	0.00083	2.72	0.004	0.281015279	0.000032	-0.7	1.0	3.01	0.02	3.18	3.37
DC1515	Conglomerate-Zeekoebaard	24		2720	4	0.281178	0.000018	0.001149	0.000038	0.05226	0.00190	2.72	0.004	0.281118141	0.000036	3.0	1.1	2.87	0.02	2.96	3.06
DC1332	Draghoender-Drag.	6		2900	6	0.281110	0.000010	0.00243	0.00006	0.1026	0.0028	2.9	0.006	0.28097465	0.000020	2.1	0.5	3.06	0.01	3.15	3.25
DC1333	Draghoender-Drag.	9		2900	6	0.281010	0.000014	0.00120	0.00006	0.0497	0.0027	2.9	0.006	0.280943284	0.000028	1.0	0.8	3.10	0.01	3.22	3.35
DC1334	Draghoender-Drag.	15		2900	6	0.281055	0.000013	0.00198	0.00005	0.0654	0.0010	2.9	0.006	0.280944877	0.000026	1.0	0.7	3.10	0.01	3.21	3.34
DC1335	Draghoender-Drag.	17		2900	6	0.281107	0.000012	0.00231	0.00005	0.0875	0.0018	2.9	0.006	0.280978593	0.000024	2.2	0.7	3.06	0.01	3.14	3.24
DC1336	Draghoender-Drag.	21		2900	6	0.280965	0.000012	0.00185	0.00009	0.0750	0.0030	2.9	0.006	0.28086223	0.000024	-1.9	0.5	3.22	0.01	3.39	3.59
DC1333	Welgevonden - Skp?	4	no geochem	2908	4	0.281012	0.000011	0.00091	0.00003	0.0391	0.0014	2.908	0.004	0.280961163	0.000022	1.8	0.7	3.08	0.01	3.17	3.28
DC1334	Welgevonden - Skp?	3	no geochem	2908	4	0.280989	0.000010	0.00176	0.00006	0.0715	0.0026	2.908	0.004	0.280890794	0.000020	-0.7	0.5	3.18	0.01	3.32	3.49
DC1335	Welgevonden - Skp?	2	no geochem	2908	4	0.281004	0.000013	0.00121	0.00003	0.0517	0.0018	2.908	0.004	0.280936538	0.000026	0.9	0.8	3.11	0.01	3.23	3.36
DC1336	Welgevonden - Skp?	7	no geochem	2908	4	0.281071	0.000012	0.00178	0.00005	0.0768	0.0024	2.908	0.004	0.280971887	0.000024	2.2	0.7	3.06	0.01	3.15	3.25
DC1337	Welgevonden - Skp?	8	no geochem	2908	4	0.280948	0.000011	0.00084	0.00003	0.0350	0.0015	2.908	0.004	0.280900966	0.000022	-0.3	0.7	3.16	0.01	3.30	3.46
DC1610	Draghoender-Drag.	10		2946	9	0.281033	0.000016	0.00140	0.00004	0.04899	0.00120	2.946	0.009	0.280953583	0.000032	2.4	1.0	3.09	0.02	3.17	3.26
DC1610	Draghoender-Drag.	11		2946	9	0.281036	0.000014	0.00222	0.00005	0.06608	0.00160	2.946	0.009	0.280910714	0.000028	0.9	0.8	3.15	0.01	3.26	3.39
DC1610	Draghoender-Drag.	13		2946	9	0.281047	0.000013	0.00123	0.00003	0.04152	0.00057	2.946	0.009	0.280977521	0.000026	3.3	0.8	3.05	0.02	3.12	3.19
DC1610	Draghoender-Drag.	26		2946	9	0.281032	0.000016	0.00143	0.00006	0.04809	0.00064	2.946	0.009	0.280950926	0.000032	2.3	0.9	3.09	0.02	3.17	3.27
DC1610	Draghoender-Drag.	28		2946	9	0.281039	0.000014	0.00113	0.00001	0.04368	0.00140	2.946	0.009	0.280975383	0.000028	3.2	0.9	3.06	0.02	3.12	3.19
DC1611	Draghoender-Drag.	6		2929	11	0.280961	0.000014	0.00151	0.00005	0.04571	0.00120	2.929	0.011	0.280876327	0.000028	-0.7	0.8	3.19	0.01	3.34	3.51
DC1611	Draghoender-Drag.	7		2929	11	0.281048	0.000010	0.00163	0.00003	0.05731	0.00074	2.929	0.011	0.280956495	0.000020	2.1	0.6	3.08	0.01	3.17	3.27
DC1611	Draghoender-Drag.	15		2929	11	0.280996	0.000012	0.00119	0.00002	0.04501	0.00093	2.929	0.011	0.280929028	0.000024	1.2	0.8	3.12	0.01	3.23	3.35
DC1611	Draghoender-Drag.	18		2929	11	0.280938	0.000019	0.00221	0.00005	0.06779	0.00270	2.929	0.011	0.280813564	0.000038	-3.0	1.2	3.28	0.02	3.47	3.70
DC1611	Draghoender-Drag.	34		2929	11	0.281016	0.000012	0.00108	0.00003	0.03917	0.00100	2.929	0.011	0.280955352	0.000024	2.1	0.7	3.08	0.01	3.17	3.27
DC1611	Draghoender-Drag.	35		2929	11	0.281128	0.000017	0.00247	0.00014	0.09746	0.00500	2.929	0.011	0.280989438	0.000034	3.3	0.7	3.04	0.01	3.10	3.17
DC1611	Draghoender-Drag.	37		2929	11	0.281046	0.000012	0.00232	0.00006	0.06507	0.00180	2.929	0.011	0.280915645	0.000024	0.7	0.6	3.14	0.01	3.26	3.39
DC1613	Skalkseput - Draghoender	2		2920	18	0.281041	0.000023	0.00132	0.00003	0.04382	0.00099	2.92	0.018	0.280967075	0.000046	2.3	1.5	3.07	0.03	3.15	3.25
DC1613	Skalkseput - Draghoender	4		2920	18	0.281013	0.000015	0.00054	0.00000	0.02157	0.00024	2.92	0.018	0.280982712	0.000030	2.9	1.1	3.04	0.02	3.12	3.20
DC1613	Skalkseput - Draghoender	7		2920	18	0.281006	0.000012	0.00009	0.00000	0.00429	0.00010	2.92	0.018	0.281000955	0.000024	3.5	0.8	3.02	0.02	3.08	3.15
DC1613	Skalkseput - Draghoender	14		2920	18	0.281013	0.000011	0.00066	0.00001	0.02635	0.00058	2.92	0.018	0.280976131	0.000022	2.6	0.7	3.05	0.01	3.13	3.22
DC1613	Skalkseput - Draghoender	15		2920	18	0.280965	0.000013	0.00128	0.00005	0.04529	0.00120	2.92	0.018	0.280893035	0.000026	-0.3	0.7	3.17	0.01	3.31	3.47
DC1612	Skalkseput-Skp	3		2898	7	0.280964	0.000014	0.00040	0.00001	0.01563	0.00029	2.898	0.007	0.280941927	0.000028	0.9	1.0	3.10	0.02	3.22	3.35
DC1612	Skalkseput-Skp	4		2898	7	0.281051	0.000013	0.00120	0.00006	0.05637	0.00400	2.898	0.007	0.280984425	0.000026	2.4	0.7	3.05	0.01	3.13	3.23
DC1612	Skalkseput-Skp	5		2898	7	0.281047	0.000018	0.00127	0.00002	0.05301	0.00063	2.898	0.007	0.28097635	0.000036	2.1	1.2	3.06	0.02	3.15	3.25
DC1612	Skalkseput-Skp	8		2898	7	0.281034	0.000013	0.00141	0.00004	0.04218	0.00082	2.898	0.007	0.280955845	0.000026	1.4	0.8	3.08	0.01	3.19	3.31
DC1612	Skalkseput-Skp	11		2898	7	0.281060	0.000017	0.00145	0.00006	0.04995	0.00310	2.898	0.007	0.280979485	0.000034	2.2	1.0	3.05	0.02	3.14	3.24

DateView Geochronology Database Kimberley Terrane rating 2 or bett 20-Jan-17

Bruce Eglington (2005)

Country	Unit	Lithology	Material Analysed	Isotope System	Interpretation	Rating #	Age	+95%	-95%	Age Units	Approach	Technique	Record ID	Reference ID	Method ID	RecordID	ContinentID	CountryID	SampleNo	Frac	OriginalNo	IncludedYN	Longitude	Latitude
This is data altready in Dateview																								
South Africa	Schweizer-Reneke	Granitoid	monazite	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	2	2880.00	2.00	2.000	Ma	Regression	TIMS (unspecified)	518	Not Defined	R	518	AFR	ZAF	TKB2	1	TKB2	Y	25.24000	-27.52000
South Africa	Draghoender Granite/Gneiss	Granite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	2	2853.00	4.00	4.000	Ma	207Pb*/206Pb*	Ion microprobe (SHRIMP)	2634	McCourt and Armstrong (2000)	R	2634	AFR	ZAF	Draghoenc	1	Draghoenc	Y	22.18000	-29.41000
South Africa	Skalkseput Granite	Granite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	2	2718.00	8.00	8.000	Ma	207Pb*/206Pb*	Ion microprobe (SHRIMP)	2649	McCourt and Armstrong (2000)	R	2649	AFR	ZAF	AJ10	1	AJ10	Y	23.21000	-30.10000
South Africa	Post-Kraaipan	Trondhjemite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	3	3008.00	4.00	4.000	Ma	Regression	TIMS (few fragments/grains)	4917	Poujol et al (2000)	R	4917	AFR	ZAF	AL1a	1	AL1a	Y	25.12000	-27.49000
South Africa	Post-Kraaipan	Trondhjemite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	3	2943.00	14.00	14.000	Ma	207Pb*/206Pb*	TIMS (few fragments/grains)	4921	Poujol et al (2000)	R	4921	AFR	ZAF	AL3	1	AL3	Y	25.12000	-27.49000
South Africa	Post-Kraaipan	Granodiorite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	3	2913.00	15.00	15.000	Ma	207Pb*/206Pb*	Ion microprobe (SHRIMP)	4923	Poujol et al (2000)	R	4923	AFR	ZAF	KP5	1	KP5	Y	25.31000	-26.31000
South Africa	Post-Kraaipan	Granodiorite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	3	2917.00	9.00	9.000	Ma	207Pb*/206Pb*	Ion microprobe (SHRIMP)	4925	Poujol et al (2000)	R	4925	AFR	ZAF	MAD1	1	MAD1	Y	25.19000	-26.50000
South Africa	Post-Kraaipan	Granodiorite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	3	2879.00	11.00	11.000	Ma	207Pb*/206Pb*	Ion microprobe (SHRIMP)	4929	Poujol et al (2000)	R	4929	AFR	ZAF	KHUN1	1	KHUN1	Y	25.32000	-26.44000
South Africa	Mosita Granite	Granite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	3	2791.00	8.00	8.000	Ma	Regression	Ion microprobe (SHRIMP)	4931	Poujol et al (2000)	R	4931	AFR	ZAF	MOS2	1	MOS2	Y	24.82000	-26.40000
South Africa	Schweizer-Reneke	Granite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	2	2927.00	23.00	6.000	Ma	Regression	TIMS (few fragments/grains)	5754	Robb, Davis, Kamo, Meyer (1992)	R	5754	AFR	ZAF	TA2	1	TA2	Y	24.98000	-27.59000
South Africa	Pre-Morokweng	Granitoid	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	3	2878.00	8.00	8.000	Ma	207Pb*/206Pb*	Ion microprobe (SHRIMP)	6883	Reimold, Armstrong and Koeberl (2002)	R	6883	AFR	ZAF	KHK-1	3406.	KHK-1	Y	23.20000	-26.66667
South Africa	Pre-Morokweng	Granophyre	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	2	2689.00	5.00	5.000	Ma	207Pb*/206Pb*	Ion microprobe (SHRIMP)	6884	Reimold, Armstrong and Koeberl (2002)	R	6884	AFR	ZAF	KHK-1	2289.	KHK-1	Y	23.20000	-26.66667
this is the new data:																								
South Africa	Koppiespan	Koppiespan Granite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	3	3061	9.0	9.0	Ma	Regression	Ion microprobe (NordSIM)		Cornell et al., 2011 Lithos			AFR	ZAF	DC0912		DC0912	Y	25.2842	-26.76975
South Africa	Motition	Motition Granite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	3	2867	7.0	7.0	Ma	Regression	Ion microprobe (NordSIM)		Cornell et al., 2011 Lithos			AFR	ZAF	DC0914		DC0914	Y	23.8798	-26.95193
South Africa	Ditshiping	Ditshiping Granite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	3	2882	7.0	7.0	Ma	Regression	Ion microprobe (NordSIM)		Cornell et al., 2011 Lithos			AFR	ZAF	DC0915		DC0915	Y	23.8313	-26.94367
South Africa	Ditshiping	Ditshiping younger Granite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	3	2854	7.0	7.0	Ma	Regression	Ion microprobe (NordSIM)		Cornell et al., 2011 Lithos			AFR	ZAF	DC0916		DC0916	Y	23.8310	-26.94413
South Africa	Kgokgole	Kgokgole Granite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	3	2857	6.0	6.0	Ma	Regression	Ion microprobe (NordSIM)		Cornell et al., 2011 Lithos			AFR	ZAF	DC0917		DC0917	Y	23.9411	-26.72218
South Africa	Bultfontein Mine Basement	Tonalite		U-Th-Pb (radiogenic)	Oscillatory zoned magmatic	2	3275	25.0	25.0	Må	207Pb/206Pb	LA-ICPMS Quadrupole		Lundell et al., 2016, Lundell 2010			AFR	ZAF	T1		T1	Y	24.7917	-28.7675
South Africa	Bultfontein Mine Basement			U-Th-Pb (radiogenic)	CL-dark low Th/U Metamorphic	2	3034	67.0	67.0	Må		LA-ICPMS Quadrupole		Lundell et al., 2016, Lundell 2010			AFR	ZAF	T1		T1	Y	24.7917	-28.7675
South Africa	vein in 2960 Ma tonalite	Granite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	2	2001	21.0	21.0	Ma	Regression	LA-ICPMS Quadrupole		Lundell et al., 2016, Lundell 2010			AFR	ZAF	T3a		T3a	Y	24.9123	-24.91232
South Africa	vein in 2960 Ma tonalite	Granite	monazite	U-Th-Pb (radiogenic)	Metamorphism	2	1049	17.0	17.0		207Pb/206Pb	LA-ICPMS Quadrupole		Lundell et al., 2016, Lundell 2010			AFR	ZAF	T3a		T3a	Y	24.9123	-24.91232
South Africa	Loxtondal Mine Basement	Tonalite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	2	2960	13.0	13.0	Ma	Regression	LA-ICPMS Quadrupole		Lundell et al., 2016, Lundell 2010			AFR	ZAF	T3b		T3b	Y	24.9123	-24.91232
South Africa	Loxtondal Mine Basement	Tonalite	monazite	U-Th-Pb (radiogenic)	Metamorphism	2	2852	13.0	13.0	Ma	207Pb/206Pb	LA-ICPMS Quadrupole		Lundell et al., 2016, Lundell 2010			AFR	ZAF	T3b		T3b	Y	24.9123	-24.91232
South Africa	Loxtondal Mine Basement	Tonalite	xenotime	U-Th-Pb (radiogenic)	Metamorphism	2	2850	18.0	18.0	Ma	207Pb/206Pb	LA-ICPMS Quadrupole		Lundell et al., 2016, Lundell 2010			AFR	ZAF	T3b		T3b	Y	24.9123	-24.91232
South Africa	du Toitspan Mine Basement	Tonalite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	2	2903	23.0	23.0	Ma	Regression	LA-ICPMS Quadrupole		Lundell et al., 2016, Lundell 2010			AFR	ZAF	T4		T4	Y	24.7985	-28.75633
South Africa	du Toitspan Mine Basement	Trondhjemite	zircon	U-Th-Pb (radiogenic)	Crystallisation (intrusive)	2	3293	13.0	13.0	Ma	Regression	LA-ICPMS Quadrupole		Lundell et al., 2016, Lundell 2010			AFR	ZAF	T5		T5	Y	24.7985	-28.75633
South Africa	du Toitspan Mine Basement	Komatiitic schist	zircon	U-Th-Pb (radiogenic)	Xenocrysts reset in magma		2908	18.0	18.0	Ma	Concordia	LA-ICPMS Quadrupole		Lundell et al., 2016, Fritiofsson, 2014			AFR	ZAF	S5		S5	Y	24.7985	-28.75633

References

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Highlights

Three granitoid types identified in SW Kaapvaal Craton basement.

2946-2900 Ma tonalite-trondhjemite Draghoender type are mafic subduction-melts.

2902 ±11 Ma Skalkseput type reflect Kimberley - Witwatersrand terrane collision.

2719 ±3 Ma Ventersdorp-age Steenkop monzogranite lies athwart the Doornberg Fault.

Kaapvaal basement continues SW of Doornberg Fault beneath Namaqua foreland thrusts.