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Appendix DR1. SHRIMP analytical procedures and data interpretation, and Tables DR1–DR9

Bushveld-aged fluid flow, peak metamorphism and gold mobilization in the Witwatersrand basin, South Africa: Constraints from in situ SHRIMP U-Pb dating of monazite and xenotime

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SHRIMP mount preparation

One sample was prepared as a grain-mount; all others were sets of core-drilled discs (usually ~3 mm diameter) or fragments of polished thin sections. The mounts were lightly re-polished (if necessary), cleaned and Au-coated before each analytical session. The standards (xenotime or monazite) were set into a separate mount that was re-polished and Au-coated with each sample mount, or batch of mounts.

Xenotime analytical procedures

Xenotime analytical procedures followed those of Fletcher et al. (2000; 2004). Pb/U calibration and matrix corrections for U- and Th-induced effects were based on concurrent measurements of the standards MG-1, BS-1 and z6413 [“Xeno1”]. Pb/Th was determined indirectly (using a fixed Th/U calibration; Fletcher et al., 2004). Matrix corrections for REE assumed the samples to have “typical hydrothermal xenotime” REE abundances. Z6413 also provided the reference data for renormalisation of $^{207}\text{Pb}/^{206}\text{Pb}$. Data were reduced using Squid 1 software (Ludwig, 2001), with subsequent spreadsheet processing for matrix effects and $^{207}\text{Pb}/^{206}\text{Pb}$ renormalisation.

Monazite analytical procedures

Monazite analytical procedures followed those of Foster et al. (2000) and Rasmussen et al. (2001). Pb/U and Pb/Th calibration, and matrix corrections for U- and Th-induced effects, were based on concurrent measurements of the standards MAD-1 (see Foster et al., 2000), QMa-28-1, PD-95 and GSC2908. Matrix corrections for REE substitutions were assumed to be negligible. PD-95 (1698 Ma, SHRIMP-calibrated against GSC2908) provided the reference data for renormalisation of $^{207}\text{Pb}/^{206}\text{Pb}$ of early data and GSC2908 (1795 Ma; Stern and Sanborn, 1998) was

used directly for some later data. Data were reduced using Krill software with a linear-log calibration for Pb/U and log-log for Pb/Th (P. Kinny, Curtin University), with subsequent spreadsheet processing for matrix effects and $^{207}\text{Pb}/^{206}\text{Pb}$ renormalisation.

Common Pb

The xenotime isotopic Pb isotope data in tables are corrected for common Pb components, based on measured ^{204}Pb and a common-Pb isotopic composition determined by the Stacey and Kramers (1975) common-Pb model at the approximate age of the samples. The data that were used for age determinations have low common-Pb contents and the ages are not sensitive to the choice of common-Pb composition. The difference in ages that would result from using a Broken Hill (or any other likely composition) is insignificant.

For monazite, the Broken Hill composition was used because of limitations in the software, but here again the choice is insignificant.

Data precision

Data are tabulated with 1σ precisions that include all quantifiable components of random scatter. This includes counting statistics, secondary ion beam stability and propagated uncertainty in the assumed common Pb isotopic composition. The precision of Pb/U and Pb/Th includes a reproducibility component determined from data for the standards; this dominates the precision of sample Pb/U and Pb/Th data. The precision listed for $^{207}\text{Pb}/^{206}\text{Pb}$ includes 1SE of the standards data used for renormalisation.

Systematic uncertainties in Pb/U

There are potential errors in Pb/U calibration from inter-mount effects (the standards being in a separate mount) and from limitations in the procedures for applying matrix corrections. These errors are essentially unquantifiable, but experience shows that unexplained data offsets $>2\%$ are extremely rare, and we consider $\pm 2\%$ a reasonable value for the uncertainty in Pb/U from these sources. The internal consistency of data—the degree of scatter in Pb/U—is considered to be a good indicator of the concordance of samples, and this is considered in conjunction with the apparent (numerical) concordance of the data.

The systematic uncertainty in Pb/Th is greater than in Pb/U, and $^{208}\text{Pb}/^{232}\text{Th}$ data are listed mainly to help assess the internal consistency of data. For xenotime the additional uncertainty arises mainly from the assumed fixed Th/U calibration. For monazite, the Pb/Th seems inherently less stable than Pb/U, possibly because of the use of Th^+ and ThO_2^+ , which behave more differently than UO^+ and UO_2^+ .

In some instances, a second analysis was carried out without moving the primary ion beam spot. The Pb/U calibration for these was not established independently, by corresponding analyses of standards, because of the time required to do so. The drift in Pb/U calibration is commonly 3–5% for consecutive analyses in xenotime (Fletcher et al., 2000) and 2–3% in monazite. For most of the data reported here, the drift appears to be less than this. In any case, the same discordance criteria have been applied as for the first analyses. This may have resulted in the retention of some data from samples that are reversely discordant, though genuine reverse discordance is rare, and will have caused the rejection of several analyses that are actually concordant. Second analyses are not shown in the concordia plots.

²⁰⁷Pb/²⁰⁶Pb uncertainties

The weighted mean ²⁰⁷Pb/²⁰⁶Pb dates were calculated using data without the precision component propagated from ²⁰⁷Pb/²⁰⁶Pb renormalisation, so that MSWD gives a correct assessment of internal consistency. The 2SE precision of the standards data was then propagated to the mean age. When data were collected in multiple analytical sessions, this averaging was carried out for the data from each session, and the resulting dates combined.

Additional notes for tables

Analysis identification for drilled-plug mounts is nnnnX.p-q(b), where

nnnn is UWA mount number,

X is the fragment of thin section in the mount (omitted for the one grain mount),

p is the monazite grain within that fragment,

q is the analysis within that grain, and

subscript b indicates a second analysis in the same spot, whereas subscript x indicates a second analysis in a separate analytical session (i.e. after re-cleaning and Au-coating).

Uranium and Th abundances and Th/U are quoted to several significant figures, but they are subject to some reservations. Absolute abundances are probably reliable to ± ~20% but internal comparisons can possibly be made to ± ~5%.

The term “f206” is the measured component of common Pb in total ²⁰⁶Pb, based on observed ²⁰⁴Pb.

“Conc.” is apparent concordance, defined as $100 * \frac{[^{206}\text{Pb}/^{238}\text{U}]}{t} / \frac{[^{207}\text{Pb}/^{206}\text{Pb}]}{t}$.

Monazite Data

04-108B, G and L

This SHRIMP mount contains monazite from black shale and siltstone from the Chuniespoort Group (drill-hole UD49; Fig. 1). Data from the monazite were collected in two sessions (Table DR1), in conjunction with 04-108A, D, M, N. Here also, the data from the sessions agree well, though the precision is only modest (but better than for the other sample due to appreciably higher U contents). Four analyses with >10% apparent discordance were not considered. No analyses had unacceptably high common Pb.

Using all data with apparent discordance <10%, the weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ age is 2061 ± 14 Ma (MSWD = 1.15). Omitting two analyses with 8% and 9% reverse discordance, changes this only insignificantly to 2058 ± 15 Ma (MSWD = 1.00). The preferred age is 2060 ± 15 Ma.

03-108

Mount 03-108 contains coarse monazite in a khaki shale (Krugersdorp Formation; Central Rand Group) collected from the Kloof mine (Fig. 1). The monazite crystals were separated from the shale and cast in a grain mount, hence the labeling in the table (Table DR2) is different to other mounts which contain discs of polished thin section. Five analyses with $\geq 1\%$ common ^{206}Pb or >5% apparent discordance were disregarded. The remaining eighteen form a single population in $^{207}\text{Pb}/^{206}\text{Pb}$ (MSWD = 1.3) with a weighted mean age of 2043 ± 7 Ma.

05-13 and 05-14

Monazite in mounts 05-13 and 05-14 is from quartz-pebble conglomerates from the Elsburg MBb Reef (Elsburg Formation, Central Rand Group), collected from drill-hole 095-349, collared on the South Deeps 95 level of the Western Areas mine. Seven analyses with >5% apparent discordance were disregarded. Three others that are concordant but have 0.25%–0.5% common ^{206}Pb and are marginal outliers in $^{207}\text{Pb}/^{206}\text{Pb}$ were also disregarded, even though this level of common Pb is normally not deleterious. Six other analyses are distinct outliers in $^{207}\text{Pb}/^{206}\text{Pb}$. Some of these are clearly detrital in origin. The younger outliers are possibly predominantly authigenic, with a small portion of residual detrital material.

Amongst the main $^{207}\text{Pb}/^{206}\text{Pb}$ population ($n = 53$; Table DR3), there is a strongly defined single age peak (MSWD = 1.1) at 2043 ± 4 Ma (rounded up). Because of limitations due to the data being all obtained from a single analytical session, and the use of PD-95 as the $^{207}\text{Pb}/^{206}\text{Pb}$ reference, we have expanded the minimum uncertainty to ± 5 Ma.

05-76A

Monazite from mount 05-76A is from the same locality as monazite in 05-13 and 05-14. Four analyses have >1% common ^{206}Pb or >5% apparent discordance. Another has ~0.6% common ^{206}Pb and has unusually low U, suggesting it might not be the same generation as the other monazite. This leaves a “best” group of only five analyses that suggest a $^{207}\text{Pb}/^{206}\text{Pb}$ age $\sim 2050 \pm 15$ Ma (MSWD = 3.9; Table DR4), which overlaps with the more precise age for monazite analyzed in mounts 05-13 and 05-14.

04-108A, D, M and N

Monazite analysed in this mount is from the Black Reef Formation (Transvaal Supergroup), collected from drill-hole VPT4 (Fig. 1). The monazite data were collected in two analytical sessions, using different $^{207}\text{Pb}/^{206}\text{Pb}$ reference standards (Table DR5). Any difference there might be in the accuracy of the two standards is irrelevant relative to the precision of the final date.

The samples all have low U contents (all are $< \sim 100$ ppm; about half are < 50 ppm), resulting in low count rates and poor precision for $^{207}\text{Pb}/^{206}\text{Pb}$. Eleven points have $< 1\%$ common ^{206}Pb and apparent discordance $< 10\%$. These give 2139 ± 37 Ma (MSWD = 1.4; Table DR5).

Applying a more stringent common-Pb criterion ($f_{206} < 0.5\%$) mainly removes the lowest-U points, leaving six with essentially the same weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ age of 2136 ± 31 Ma, with MSWD = 1.04. This indicates that the low radiogenic count rates are not introducing excessive sensitivity to the Th-related isobar correction (or other noise problems) at mass 204. The age of this sample is not precisely determined. Because of the small number of analyses, we use a conservative uncertainty. The preferred age is 2140 ± 40 Ma.

06-42B, G and H

This sample is from a pyritic, quartz-pebble conglomerate (Mondeor Formation; Central Rand Group) recovered from HAK-11 drill hole (Fig. 1). The data are all from three large aggregate crystals (Table DR6). One of these (06-42G) clearly includes a detrital grain, and there is one old outlier from the authigenic data population (06-42H.1-5), which might also have a minor detrital component, although this is not apparent in any SEM images or WDS element maps. The remaining 15 analyses are concordant and well-clustered in $^{207}\text{Pb}/^{206}\text{Pb}$ (MSWD = 0.95), and give a weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ age of 2121 ± 9 Ma.

05-76G

This sample is also from drill-hole HAK-11 (see above), but was collected from the underlying Randfontein Formation (Central Rand Group). Monazite was relatively scarce and restricted to minute, inclusion-rich crystals. Five analyses from two grains suggest a $^{207}\text{Pb}/^{206}\text{Pb}$ age ~ 2150 Ma, but there is appreciable scatter (MSWD = 2.4; Table DR7).

Xenotime Data

04-130B and G

Xenotime analyzed in this mount (plugs B and G) is from the Black Reef Formation (Transvaal Supergroup), collected from drill-hole VPT4 (Fig. 1). Data from the two sessions agree well (within 5 Ma), despite the unusually large difference (~20 Ma) in the $^{207}\text{Pb}/^{206}\text{Pb}$ re-normalisations required. There is a general trend to apparent (normal) discordance but only two analyses were disregarded on the basis of apparent discordance (>5%). The one repeat analysis is apparently concordant. There is one young outlier in $^{207}\text{Pb}/^{206}\text{Pb}$ (>3 σ). Data from the remaining “main group” (n = 31) gives MSWD = 0.9 within each analytical session and a combined, rounded-up weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ age of 2032 ± 5 Ma (Table DR8).

B-16

Xenotime in this mount B-16 is from an interbedded shale and siltstone from the Parktown Formation (West Rand Group) collected from drill-hole EVRK20 (Fig. 1). Two marginally discordant points (>5% apparent discordance) were disregarded, although their $^{207}\text{Pb}/^{206}\text{Pb}$ are entirely consistent with the other data (Table DR9). The main set of fourteen analyses has a weighted mean $^{207}\text{Pb}/^{206}\text{Pb}$ age of 2050 ± 8 Ma (MSWD = 0.84). This is consistent with the two analyses of this sample published by Kositcin et al. (2003)

TABLE DRI. SHRIMP U-Pb FOR MONAZITE IN THE CHUNIESPOORT GROUP, DRILL-HOLE UD-49

Analysis spot	U (ppm)	Th (ppm)	Th/U	f206 (%)	$^{207}\text{Pb}^*/^{206}\text{Pb}^*$	\pm	$^{206}\text{Pb}^*/^{238}\text{U}$	\pm	$^{207}\text{Pb}^*/^{235}\text{U}$	\pm	$^{208}\text{Pb}^*/^{232}\text{Th}$	\pm	conc. (%)	$^{207}\text{Pb}^*/^{206}\text{Pb}^*$ Age (Ma)	\pm (Ma)
Best data, in order of $^{207}\text{Pb}/^{206}\text{Pb}$															
04108G.1-6	209	1670	8.0	0.357	0.1225	0.0183	0.365	0.008	6.17	0.17	0.1065	0.0035	101	1993	27
04108L.1-6	103	2550	25	0.289	0.1247	0.0277	0.409	0.011	7.03	0.26	0.1279	0.0043	109	2025	39
04108G.1-2	162	1430	8.8	0.182	0.1250	0.0192	0.381	0.008	6.56	0.19	0.1051	0.0036	102	2029	27
04108L.1-7	137	1600	12	0.019	0.1259	0.0186	0.386	0.011	6.70	0.23	0.1123	0.0039	103	2042	26
04108G.1-1	230	1750	7.6	0.000	0.1261	0.0196	0.367	0.010	6.39	0.21	0.1065	0.0025	99	2045	27
04108G.1-7b	178	1210	6.8	0.165	0.1266	0.0157	0.385	0.009	6.71	0.18	0.1244	0.0046	102	2051	22
04108L.1-1	260	1770	6.8	0.024	0.1267	0.0154	0.357	0.008	6.25	0.16	0.0994	0.0022	96	2053	21
04108L.1-2	324	1780	5.5	0.147	0.1271	0.0149	0.378	0.008	6.63	0.17	0.1088	0.0038	101	2058	21
04108G.1-3	238	1530	6.4	0.002	0.1274	0.0188	0.389	0.010	6.83	0.22	0.1103	0.0041	103	2063	26
04108L.1-2b	207	3650	18	0.102	0.1276	0.0133	0.354	0.007	6.23	0.15	0.1109	0.0026	95	2065	18
04108G.1-7	196	1720	8.8	0.000	0.1278	0.0096	0.376	0.008	6.63	0.16	0.1092	0.0041	100	2068	13
04108G.1-2b	148	1040	7.1	0.089	0.1280	0.0140	0.373	0.007	6.58	0.16	0.1168	0.0042	99	2071	19
04108G.1-4	176	2020	12	0.066	0.1292	0.0184	0.364	0.010	6.48	0.22	0.1107	0.0036	96	2087	25
04108B.1-1b	73	4420	60	0.000	0.1292	0.0182	0.377	0.009	6.71	0.20	0.1210	0.0039	99	2087	25
04108B.1-1	109	8890	82	0.261	0.1308	0.0201	0.424	0.011	7.65	0.24	0.1202	0.0026	108	2109	27
>10% discordant															
04108B.1-1c	94	3150	34	0.018	0.1319	0.0176	0.466	0.013	8.49	0.27	0.1508	0.0059	116	2124	23
04108L.1-5	122	1550	13	0.000	0.1268	0.0185	0.436	0.014	7.62	0.27	0.1281	0.0046	114	2054	26
04108L.1-3	125	2840	23	0.191	0.1281	0.0206	0.321	0.009	5.67	0.19	0.0938	0.0031	87	2072	28
04108L.1-1b	193	1730	9.0	0.039	0.1291	0.0115	0.320	0.007	5.69	0.14	0.0970	0.0020	86	2086	16

$^{207}\text{Pb}/^{206}\text{Pb}$ normalized to PD-95 (1698 Ma) [analyses on 08/03/05] and GSC2908 (1795 Ma) [analyses on 09/08/06].

TABLE DR2. SHRIMP U-Pb FOR MONAZITE IN THE CENTRAL RAND GROUP, KLOOF MINE

Analysis spot	U (ppm)	Th (ppm)	Th/U	f206 (%)	$^{207}\text{Pb}^*/^{206}\text{Pb}^*$	\pm	$^{206}\text{Pb}^*/^{238}\text{U}$	\pm	$^{207}\text{Pb}^*/^{235}\text{U}$	\pm	$^{208}\text{Pb}^*/^{232}\text{Th}$	\pm	conc. (%)	$^{207}\text{Pb}^*/^{206}\text{Pb}^*$ Age (Ma)	\pm (Ma)
Main Group, in order or $^{207}\text{Pb}/^{206}\text{Pb}$ date															
03108.5-5	723	3120	4.31	0.188	0.1248	0.0010	0.3766	0.0083	6.48	0.16	0.1149	0.0031	102	2026	14
03108.6-5	1000	3540	3.53	0.041	0.1253	0.0004	0.3641	0.0079	6.29	0.14	0.1084	0.0029	98	2032	6
03108.5-3	826	2360	2.86	0.065	0.1253	0.0006	0.3809	0.0083	6.58	0.15	0.1147	0.0033	102	2033	9
03108.6-2	795	1500	1.89	0.049	0.1254	0.0005	0.3796	0.0082	6.57	0.15	0.1097	0.0031	102	2035	8
03108.4-2	1080	677	0.63	0.020	0.1255	0.0007	0.3638	0.0079	6.30	0.15	0.1094	0.0033	98	2036	10
03108.3-2	381	146	0.38	0.066	0.1256	0.0008	0.3710	0.0082	6.43	0.15	0.1085	0.0041	100	2038	11
03108.6-1	903	2280	2.53	0.038	0.1256	0.0004	0.3659	0.0079	6.34	0.14	0.1089	0.0030	99	2038	6
03108.6-3	745	2290	3.08	0.030	0.1257	0.0007	0.3783	0.0084	6.56	0.15	0.1042	0.0029	101	2038	10
03108.5-4	400	1580	3.94	0.039	0.1261	0.0005	0.3790	0.0084	6.59	0.15	0.1097	0.0030	101	2045	8
03108.6-4	784	3210	4.09	0.012	0.1261	0.0007	0.3603	0.0081	6.27	0.15	0.1055	0.0029	97	2045	10
03108.4-1	532	373	0.70	0.119	0.1262	0.0009	0.3656	0.0083	6.36	0.16	0.1138	0.0037	98	2046	13
03108.2-3	390	347	0.89	0.427	0.1262	0.0013	0.3818	0.0087	6.65	0.17	0.1084	0.0037	102	2046	19
03108.2-2	870	1720	1.98	0.034	0.1265	0.0005	0.3519	0.0077	6.14	0.14	0.1029	0.0029	95	2050	8
03108.6-7	510	970	1.90	0.294	0.1266	0.0007	0.3689	0.0081	6.44	0.15	0.1084	0.0031	99	2051	10
03108.2-1	604	583	0.96	0.114	0.1266	0.0008	0.3824	0.0086	6.68	0.16	0.1158	0.0036	102	2052	10
03108.3-1	412	192	0.47	0.017	0.1269	0.0006	0.3859	0.0085	6.75	0.16	0.1077	0.0045	102	2056	8
03108.1-1	303	948	3.13	0.566	0.1272	0.0011	0.3575	0.0084	6.27	0.16	0.1080	0.0031	96	2060	15
03108.1-2	495	11000	22.3	0.083	0.1274	0.0006	0.3783	0.0086	6.64	0.16	0.1171	0.0033	100	2062	8
>>1% common Pb or >5% discordant															
03108.5-6	651	4180	6.42	0.541	0.1245	0.0013	0.3930	0.0087	6.75	0.17	0.1114	0.0031	106	2022	19
03108.1-3	686	1590	2.31	0.974	0.1289	0.0014	0.4065	0.0090	7.22	0.19	0.1226	0.0035	106	2083	19
03108.6-6	1320	1060	0.80	1.004	0.1281	0.0008	0.4189	0.0091	7.40	0.17	0.1329	0.0041	109	2073	12
03108.5-2	638	948	1.49	2.172	0.1184	0.0053	0.3590	0.0085	5.86	0.29	0.1045	0.0045	102	1932	81
03108.5-1	1180	937	0.80	4.511	0.1223	0.0075	0.4400	0.0108	7.42	0.47	0.1425	0.0112	118	1991	108

$^{207}\text{Pb}/^{206}\text{Pb}$ normalized to PD-95 (1698 Ma). Analysed 01/02/04.

TABLE DR3. SHRIMP U-Pb FOR MONAZITE IN THE CENTRAL RAND GROUP, WESTERN AREAS MINE

Analysis spot	U (ppm)	Th (ppm)	Th/U	f206 (%)	$^{207}\text{Pb}^*/^{206}\text{Pb}^*$		$^{206}\text{Pb}^*/^{238}\text{U}$		$^{207}\text{Pb}^*/^{235}\text{U}$		$^{208}\text{Pb}^*/^{232}\text{Th}$		$^{207}\text{Pb}^*/^{206}\text{Pb}^*$		
						±		±		±		±	conc. (%)	Age (Ma)	± (Ma)
Main Group, in order of $^{207}\text{Pb}/^{206}\text{Pb}$ date															
0513F.1-1	4970	3550	0.71	0.050	0.1248	0.0004	0.3794	0.0041	6.527	0.075	0.1059	0.0013	102	2026	6
0514D.1-4	1050	17300	16.5	0.020	0.1251	0.0004	0.3890	0.0043	6.708	0.079	0.1080	0.0012	104	2030	6
0514D.1-1	1140	10600	9.28	0.017	0.1253	0.0007	0.3820	0.0047	6.598	0.091	0.1067	0.0013	103	2033	10
0514B.1-5	2510	1430	0.57	0.019	0.1253	0.0003	0.3758	0.0039	6.492	0.070	0.1083	0.0015	101	2033	4
0514B.1-3	2060	2730	1.32	0.019	0.1254	0.0004	0.3698	0.0038	6.393	0.069	0.1071	0.0014	100	2034	5
0513F.1-3	2440	34500	14.1	0.064	0.1254	0.0006	0.3902	0.0047	6.747	0.090	0.1145	0.0014	104	2035	9
0514B.1-1	1860	3440	1.85	0.024	0.1255	0.0004	0.3620	0.0040	6.265	0.073	0.0979	0.0013	98	2036	5
0514B.1-1	1290	1890	1.47	0.101	0.1255	0.0004	0.3661	0.0044	6.335	0.082	0.1071	0.0019	99	2036	6
0514D.1-10	1410	5330	3.79	0.019	0.1256	0.0004	0.3811	0.0042	6.597	0.077	0.1044	0.0016	102	2037	6
0513H.1-1	1120	13500	12.1	0.005	0.1256	0.0005	0.3668	0.0040	6.351	0.074	0.1048	0.0013	99	2037	6
0514B.1-2	1910	3660	1.92	0.012	0.1256	0.0005	0.3667	0.0040	6.351	0.074	0.1046	0.0013	99	2038	7
0514B.1-5	1770	1410	0.80	0.026	0.1256	0.0005	0.3892	0.0044	6.741	0.083	0.1103	0.0015	104	2038	7
0513A.1-3	2270	15800	6.94	0.046	0.1256	0.0004	0.3782	0.0042	6.552	0.077	0.1080	0.0014	101	2038	6
0514D.1-6	1700	3050	1.79	0.042	0.1257	0.0004	0.3810	0.0041	6.602	0.077	0.1055	0.0014	102	2038	6
0514A.1-2	2320	3250	1.40	0.005	0.1257	0.0004	0.3904	0.0042	6.768	0.077	0.1149	0.0014	104	2039	5
0514A.1-5	1220	22800	18.8	0.034	0.1257	0.0003	0.3940	0.0044	6.831	0.080	0.1131	0.0014	105	2039	5
0513B.1-1	223	197	0.88	0.064	0.1258	0.0008	0.3767	0.0050	6.532	0.098	0.1047	0.0026	101	2039	11
0514D.1-2	1780	6770	3.80	0.059	0.1258	0.0005	0.3880	0.0047	6.728	0.088	0.1088	0.0015	104	2040	7
0513H.1-3	1560	13100	8.38	0.021	0.1258	0.0005	0.3888	0.0044	6.742	0.083	0.1099	0.0013	104	2040	8
0513H.1-4	2060	11900	5.80	0.027	0.1259	0.0004	0.3890	0.0042	6.751	0.078	0.1101	0.0013	104	2041	6
0514B.1-2	2000	2080	1.04	0.011	0.1259	0.0003	0.3879	0.0041	6.733	0.073	0.1107	0.0014	103	2042	4
0514A.1-1	1900	11700	6.17	0.031	0.1259	0.0005	0.3733	0.0044	6.481	0.082	0.1055	0.0013	100	2042	7
0513F.1-6	4520	408	0.09	0.004	0.1259	0.0003	0.3799	0.0039	6.597	0.072	0.1053	0.0019	102	2042	5
0513G.1-2	1130	10600	9.31	0.014	0.1259	0.0007	0.3883	0.0053	6.743	0.104	0.0781	0.0011	104	2042	10
0514D.1-5	2150	2550	1.19	0.015	0.1260	0.0004	0.3826	0.0041	6.645	0.076	0.1081	0.0014	102	2042	5
0513H.1-7	2260	7790	3.45	0.024	0.1260	0.0004	0.3962	0.0042	6.881	0.078	0.1121	0.0013	105	2042	5
0514A.1-4	1600	14700	9.22	0.022	0.1260	0.0004	0.3941	0.0042	6.846	0.078	0.1135	0.0013	105	2043	5
0514C.1-4	2170	1590	0.73	0.007	0.1260	0.0005	0.3822	0.0043	6.638	0.082	0.1081	0.0019	102	2043	7
0513H.1-5	1740	10400	5.99	0.040	0.1260	0.0003	0.3877	0.0040	6.736	0.073	0.1109	0.0013	103	2043	5
0513H.1-2	1510	5130	3.40	0.000	0.1260	0.0003	0.3901	0.0043	6.779	0.078	0.1117	0.0014	104	2043	5
0514A.1-9	1850	2450	1.32	0.009	0.1261	0.0004	0.3756	0.0040	6.528	0.073	0.1072	0.0014	101	2044	5

0513E.1-1	1850	5860	3.17	0.010	0.1261	0.0003	0.3807	0.0040	6.617	0.073	0.1058	0.0013	102	2044	5
0514D.1-3	2270	3130	1.38	0.007	0.1261	0.0004	0.3835	0.0041	6.666	0.076	0.1089	0.0014	102	2044	6
0513B.1-2	136	145	1.07	0.120	0.1261	0.0010	0.3728	0.0058	6.479	0.118	0.1071	0.0030	100	2044	15
0513I.1-1	2430	4060	1.67	0.005	0.1261	0.0003	0.3918	0.0040	6.811	0.073	0.1107	0.0013	104	2044	4
0514A.1-7	1730	6200	3.58	0.017	0.1261	0.0003	0.3863	0.0045	6.716	0.081	0.1081	0.0013	103	2044	4
0514A.1-8	1700	4620	2.72	0.093	0.1261	0.0004	0.3851	0.0041	6.697	0.076	0.1089	0.0014	103	2044	6
0513G.1-3	1660	1080	0.65	0.011	0.1261	0.0003	0.3738	0.0039	6.500	0.071	0.1055	0.0015	100	2045	4
0513F.5-1	3950	1260	0.32	0.009	0.1261	0.0002	0.3705	0.0038	6.443	0.068	0.1050	0.0014	99	2045	3
0514A.1-10	2680	7240	2.71	0.000	0.1262	0.0004	0.3839	0.0041	6.680	0.076	0.1077	0.0013	102	2045	6
0514C.1-3	1830	337	0.18	0.011	0.1262	0.0004	0.3790	0.0040	6.594	0.073	0.1112	0.0022	101	2046	5
0513F.1-4	3650	1320	0.36	0.013	0.1262	0.0004	0.3698	0.0039	6.437	0.072	0.1085	0.0016	99	2046	5
0514C.1-2	2580	737	0.29	0.006	0.1262	0.0003	0.3778	0.0038	6.576	0.069	0.1078	0.0016	101	2046	4
0513D.1-2	5580	4620	0.83	0.016	0.1262	0.0002	0.3755	0.0038	6.536	0.067	0.1094	0.0015	100	2046	2
0513A.1-4	3420	7590	2.22	0.031	0.1262	0.0003	0.3782	0.0040	6.584	0.072	0.1141	0.0014	101	2046	4
0514D.1-9	2010	4390	2.19	0.008	0.1262	0.0004	0.3774	0.0040	6.569	0.073	0.1043	0.0013	101	2046	5
0514C.1-1	2910	755	0.26	0.000	0.1263	0.0002	0.3734	0.0038	6.501	0.069	0.1051	0.0016	100	2047	3
0514D.1-7	1890	1430	0.76	0.022	0.1263	0.0004	0.3852	0.0040	6.707	0.075	0.1074	0.0014	103	2047	6
0514D.1-8	2730	2700	0.99	0.002	0.1263	0.0004	0.3833	0.0041	6.674	0.076	0.1048	0.0013	102	2047	6
0514B.1-4	2610	2650	1.01	0.010	0.1263	0.0003	0.3749	0.0039	6.531	0.071	0.1065	0.0014	100	2048	4
0513H.1-10	2000	5180	2.59	0.005	0.1264	0.0004	0.3866	0.0041	6.736	0.076	0.1090	0.0014	103	2048	5
0514A.1-6	1700	8970	5.27	0.014	0.1264	0.0003	0.3861	0.0041	6.728	0.074	0.1116	0.0013	103	2048	4
0513H.1-6	2670	6530	2.45	0.009	0.1265	0.0004	0.3916	0.0042	6.828	0.077	0.1130	0.0014	104	2049	5
0513H.1-8	2070	11600	5.61	0.011	0.1265	0.0004	0.3958	0.0041	6.901	0.077	0.1116	0.0014	105	2049	5
0513H.1-9	2520	7540	2.99	0.007	0.1267	0.0004	0.3892	0.0043	6.797	0.079	0.1100	0.0013	103	2052	6
0513E.1-2	1870	5130	2.74	0.106	0.1270	0.0004	0.3981	0.0042	6.970	0.079	0.1024	0.0014	105	2057	6
0513G.1-1	2790	5000	1.79	0.012	0.1270	0.0005	0.3921	0.0043	6.868	0.082	0.0905	0.0018	104	2057	7
Old outliers in $^{207}\text{Pb}/^{206}\text{Pb}$															
0513D.1-3	4690	4970	1.06	0.073	0.1286	0.0004	0.3995	0.0042	7.083	0.079	0.1135	0.0014	104	2079	6
0514E.1-4	1010	55800	55.0	0.080	0.1296	0.0011	0.4048	0.0049	7.231	0.112	0.1184	0.0014	105	2092	15
0513E.1-3	1470	4820	3.29	0.075	0.1322	0.0007	0.3839	0.0050	6.997	0.101	0.1035	0.0015	98	2127	10
0514E.1-6	1020	20300	19.9	0.118	0.1766	0.0012	0.4982	0.0076	12.128	0.207	0.1225	0.0016	99	2621	11
0514E.1-1	1030	19800	19.2	0.023	0.2204	0.0014	0.5774	0.0091	17.546	0.304	0.1517	0.0020	98	2984	10
0513A.1-1	2490	47300	19.0	0.020	0.2275	0.0006	0.6034	0.0064	18.925	0.211	0.1607	0.0019	100	3034	4
>5% Discordant or >0.25% common Pb															
0513D.1-1	1130	66700	59.2	0.142	0.1252	0.0005	0.3967	0.0044	6.851	0.084	0.1187	0.0014	106	2032	8
0514A.1-3	2360	10500	4.45	0.008	0.1259	0.0004	0.3995	0.0043	6.937	0.080	0.1145	0.0013	106	2042	5
0514B.1-3	1780	1870	1.05	0.251	0.1241	0.0007	0.3844	0.0045	6.576	0.086	0.1063	0.0016	104	2015	10

0513A.1-2	1346	88900	66.0	0.311	0.1239	0.0009	0.4065	0.0055	6.945	0.111	0.1115	0.0014	109	2013	13
0513F.1-2	537	32200	59.9	0.383	0.1244	0.0008	0.4498	0.0055	7.713	0.112	0.1219	0.0015	119	2020	12
0513C.1-1	1610	3040	1.89	0.426	0.1289	0.0008	0.4060	0.0045	7.216	0.094	0.1000	0.0015	105	2083	12
0514B.1-4	3410	236	0.07	0.521	0.1236	0.0016	0.3701	0.0040	6.305	0.107	0.0748	0.0222	101	2008	23
0514E.1-7	2450	51400	21.0	0.521	0.1421	0.0012	0.4882	0.0069	9.562	0.163	0.1167	0.0014	114	2252	14
0514E.1-2	1420	20300	14.3	1.467	0.1971	0.0034	0.8741	0.0120	23.760	0.534	0.1652	0.0020	144	2803	28
0514E.1-3	2280	52200	22.9	3.401	0.1438	0.0024	1.0966	0.0217	21.750	0.589	0.1014	0.0013	210	2274	29

²⁰⁷Pb/²⁰⁶Pb normalized to PD-95 (1698 Ma). Analysed 21/02/05. This session had abnormally good reproducibility for the Pb/U on standards, and a reproducibility of 1% (1σ) has been applied.

TABLE DR4. SHRIMP U-Pb FOR MONAZITE IN THE CENTRAL RAND GROUP, WESTERN AREAS MINE

Analysis spot	U (ppm)	Th (ppm)	Th/U	f206 (%)	$^{207}\text{Pb}^*/^{206}\text{Pb}^*$	\pm	$^{206}\text{Pb}^*/^{238}\text{U}$	\pm	$^{207}\text{Pb}^*/^{235}\text{U}$	\pm	$^{208}\text{Pb}^*/^{232}\text{Th}$	\pm	conc. (%)	$^{207}\text{Pb}^*/^{206}\text{Pb}^*$ Age (Ma)	\pm (Ma)
Best data, in order of $^{207}\text{Pb}/^{206}\text{Pb}$															
0576A.1-10x	2330	1580	0.68	0.001	0.1260	0.0004	0.3600	0.0062	6.252	0.113	0.0914	0.0029	97	2042	5
0576A.1-8x	2560	2810	1.10	0.012	0.1261	0.0005	0.3797	0.0066	6.600	0.121	0.0997	0.0031	102	2044	7
0576A.1-3	1660	1380	0.83	0.276	0.1264	0.0006	0.3754	0.0066	6.545	0.124	0.1050	0.0034	100	2049	8
0576A.1-5	2330	7990	3.4	0.061	0.1279	0.0005	0.3975	0.0069	7.008	0.129	0.1113	0.0034	104	2069	7
0576A.1-9x	2020	3750	1.9	0.034	0.1279	0.0006	0.3766	0.0065	6.641	0.124	0.0995	0.0030	100	2069	8
>0.5% common Pb or >5% discordant															
0576A.1-1	556	2760	5.1	1.909	0.1272	0.0026	0.3717	0.0093	6.521	0.222	0.0992	0.0035	99	2060	36
0576A.1-1b	387	2160	5.6	1.374	0.1285	0.0020	0.3629	0.0078	6.431	0.181	0.1032	0.0031	96	2078	28
0576A.1-4	2230	7230	3.2	0.050	0.1280	0.0006	0.4162	0.0073	7.345	0.138	0.1195	0.0038	108	2071	8
0576A.1-5b	1750	6710	3.8	2.920	0.1294	0.0014	0.4220	0.0081	7.530	0.174	0.1098	0.0033	109	2090	19
0576A.1-7x	268	2600	9.7	0.667	0.1277	0.0016	0.3727	0.0076	6.562	0.164	0.1023	0.0031	99	2066	22

$^{207}\text{Pb}/^{206}\text{Pb}$ normalized to GSC2908 (1795 Ma). Analysed 18/11/05.

TABLE DR5. SHRIMP U-Pb FOR MONAZITE IN THE CHUNIESPOORT GROUP, DRILL-HOLE VPT4

Analysis spot	U (ppm)	Th (ppm)	Th/U	f206 (%)	$^{207}\text{Pb}^*/^{206}\text{Pb}^*$ ±	$^{206}\text{Pb}^*/^{238}\text{U}$ ±	$^{207}\text{Pb}^*/^{235}\text{U}$ ±	$^{208}\text{Pb}^*/^{232}\text{Th}$ ±	conc. (%)	$^{207}\text{Pb}^*/^{206}\text{Pb}^*$ Age ± (Ma)
Best data, in order of $^{207}\text{Pb}/^{206}\text{Pb}$										
04108D.1-1b	39	229	5.9	0.953	0.1251 0.0038	0.376 0.014	6.48 0.32	0.1239 0.0040	101	2030 53
04108D.1-1	74	426	5.8	0.339	0.1300 0.0033	0.413 0.014	7.41 0.33	0.1147 0.0049	106	2098 45
04108N.1-1b	73	442	6.1	0.243	0.1301 0.0025	0.396 0.013	7.11 0.28	0.1360 0.0050	102	2100 34
04108N.1-1	103	1140	11	0.033	0.1326 0.0019	0.417 0.012	7.63 0.26	0.1299 0.0036	105	2133 25
04108A.1-4	22	589	27	0.797	0.1346 0.0068	0.395 0.016	7.32 0.50	0.1132 0.0048	99	2158 89
04108M.1-2	18	4000	220	0.580	0.1349 0.0061	0.384 0.016	7.15 0.46	0.1084 0.0040	97	2163 79
04108M.1-4	43	1040	24	0.350	0.1353 0.0051	0.366 0.018	6.82 0.45	0.1064 0.0072	93	2168 66
04108M.1-3	39	497	13	0.000	0.1358 0.0036	0.388 0.017	7.26 0.39	0.1199 0.0062	97	2175 47
04108D.1-2	46	818	18	0.195	0.1387 0.0039	0.403 0.014	7.72 0.36	0.0995 0.0034	99	2211 49
04108A.1-2	24	394	16	0.570	0.1408 0.0089	0.392 0.019	7.61 0.64	0.1108 0.0047	95	2237 110
04108D.1-3	31	432	14	0.700	0.1418 0.0046	0.400 0.013	7.82 0.38	0.1125 0.0076	96	2250 56
>1% common Pb or >10% discordant										
04108M.1-1	33	2050	63	0.618	0.1333 0.0061	0.445 0.020	8.17 0.55	0.1171 0.0032	111	2142 80
04108A.1-1	16	13400	810	1.227	0.1415 0.0060	0.364 0.021	7.11 0.53	0.1084 0.0021	89	2246 74
04108A.1-5	18	4120	230	2.323	0.1424 0.0088	0.394 0.016	7.73 0.59	0.1020 0.0036	95	2257 106
04108D.1-2	43	5700	130	3.163	0.1381 0.0098	0.392 0.014	7.45 0.62	0.1058 0.0040	97	2203 124
04108N.1-3b	25	3080	120	7.305	0.1071 0.0159	0.423 0.020	6.25 0.99	0.1144 0.0037	130	1750 272

$^{207}\text{Pb}/^{206}\text{Pb}$ normalized to PD-95 (1698 Ma) [analyses on 08/03/05] and GSC2908 (1795 Ma) [analyses on 09/08/06].

**TABLE DR6. SHRIMP U-Pb FOR MONAZITE IN THE MONDEOR FORMATION,
CENTRAL RAND GROUP, DRILL-HOLE HAK11**

Analysis spot	U (ppm)	Th (ppm)	Th/U	f206 (%)	$^{207}\text{Pb}^*/^{206}\text{Pb}^*$		$^{206}\text{Pb}^*/^{238}\text{U}$		$^{207}\text{Pb}^*/^{235}\text{U}$		$^{208}\text{Pb}^*/^{232}\text{Th}$		conc. (%)	$^{207}\text{Pb}^*/^{206}\text{Pb}^*$	
						±		±		±		±		Age (Ma)	± (Ma)
Detrital component															
0642G.1-1	2720	53600	20	0.038	0.2041	0.0006	0.582	0.013	16.38	0.38	0.1509	0.0042	103	2859	5
0642G.1-6	2480	54000	22	0.037	0.2045	0.0006	0.578	0.013	16.29	0.38	0.1621	0.0045	103	2863	5
0642G.1-5	2630	53800	20	0.025	0.2046	0.0006	0.583	0.013	16.46	0.38	0.1629	0.0045	103	2863	5
0642G.1-2	2500	49900	20	0.032	0.2056	0.0005	0.572	0.013	16.21	0.37	0.1641	0.0045	102	2871	4
0642G.1-4	2980	63900	21	0.014	0.2061	0.0005	0.561	0.013	15.94	0.37	0.1435	0.0040	100	2875	4
Authigenic component															
0642B.1-1	114	14200	124	0.299	0.1293	0.0013	0.398	0.010	7.09	0.20	0.1127	0.0031	103	2088	17
0642G.1-11	251	2030	8.1	0.128	0.1304	0.0013	0.361	0.009	6.49	0.17	0.1089	0.0032	95	2103	17
0642B.1-3	175	16000	91	0.006	0.1306	0.0007	0.412	0.009	7.41	0.18	0.1152	0.0032	106	2106	10
0642G.1-10	310	1610	5.2	0.187	0.1306	0.0012	0.404	0.010	7.28	0.19	0.1143	0.0035	104	2106	17
0642B.1-7	416	179	0.4	0.038	0.1314	0.0011	0.410	0.010	7.42	0.20	0.1183	0.0049	105	2116	14
0642H.1-1	232	1220	5.2	0.095	0.1315	0.0011	0.386	0.009	7.01	0.18	0.1074	0.0032	99	2118	14
0642G.1-7	285	11200	39	0.076	0.1317	0.0008	0.409	0.009	7.42	0.18	0.1120	0.0031	104	2121	10
0642G.1-8	218	25000	114	0.315	0.1317	0.0012	0.400	0.010	7.26	0.19	0.1148	0.0032	102	2121	16
0642B.1-5	224	3590	16	0.000	0.1320	0.0010	0.396	0.010	7.21	0.19	0.1140	0.0033	101	2125	13
0642B.1-2	177	14400	81	0.000	0.1321	0.0008	0.401	0.009	7.30	0.18	0.1149	0.0031	102	2126	10
0642G.1-9	208	5420	26	0.335	0.1322	0.0010	0.409	0.010	7.45	0.19	0.1145	0.0032	104	2127	14
0642B.1-6	250	528	2.1	0.010	0.1323	0.0012	0.401	0.010	7.32	0.20	0.1179	0.0042	102	2129	16
0642B.1-4	265	7670	29	0.030	0.1324	0.0007	0.410	0.009	7.49	0.18	0.1166	0.0032	104	2130	10
0642H.1-2	356	1350	3.8	0.136	0.1330	0.0009	0.369	0.009	6.76	0.18	0.1027	0.0036	95	2138	11
0642H.1-4	300	3390	11	0.159	0.1332	0.0014	0.364	0.009	6.69	0.19	0.1053	0.0030	94	2140	18
Old outlier															
0642H.1-5	333	2090	6.3	0.079	0.1371	0.0011	0.381	0.009	7.21	0.19	0.1150	0.0036	95	2191	14

$^{207}\text{Pb}/^{206}\text{Pb}$ normalized to GSC2908 (1795 Ma). Analysed 26/07/06.

TABLE DR7. SHRIMP U-Pb FOR MONAZITE IN THE RANDFONTEIN FORMATION, CENTRAL RAND GROUP, DRILL-HOLE HAK11

Analysis spot	U (ppm)	Th (ppm)	Th/U	f206 (%)	$^{207}\text{Pb}^*/^{206}\text{Pb}^*$		$^{206}\text{Pb}^*/^{238}\text{U}$		$^{207}\text{Pb}^*/^{235}\text{U}$		$^{208}\text{Pb}^*/^{232}\text{Th}$		conc. (%)	$^{207}\text{Pb}^*/^{206}\text{Pb}^*$	
						±		±		±		±		Age (Ma)	± (Ma)
Best data, in order of $^{207}\text{Pb}/^{206}\text{Pb}$															
0576G.2-1b	691	2880	4.2	0.052	0.1326	0.0007	0.424	0.008	7.76	0.15	0.1199	0.0043	107	2132	10
0576G.1-2	940	1950	2.1	0.040	0.1328	0.0006	0.400	0.007	7.33	0.14	0.1110	0.0035	102	2136	8
0576G.1-3	787	1820	2.3	0.013	0.1345	0.0005	0.395	0.007	7.32	0.14	0.1104	0.0036	99	2157	7
0576G.2-1	792	2360	3.0	0.000	0.1350	0.0008	0.403	0.007	7.50	0.15	0.1174	0.0040	101	2164	11
0576G.1-4	583	3390	5.8	0.009	0.1376	0.0008	0.392	0.008	7.44	0.16	0.1086	0.0035	97	2197	10
Not considered; highly unstable primary beam															
0576G.1-1	509	4370	8.6	0.009	0.1415	0.0009	0.393	0.007	7.68	0.16	0.1193	0.0038	95	2246	11
0576G.1-1b	850	2440	2.9	0.295	0.1335	0.0012	0.387	0.008	7.12	0.16	0.1097	0.0049	98	2145	16
0576G.1-1x	700	3310	4.7	0.026	0.1369	0.0011	0.389	0.008	7.35	0.16	0.1163	0.0036	97	2188	13

$^{207}\text{Pb}/^{206}\text{Pb}$ normalized to GSC2908 (1795 Ma). Analysed 18/11/05.

TABLE DR8. SHRIMP U-Pb FOR XENOTIME IN THE CHUNIESPOORT GROUP, DRILL-HOLE VPT4

Analysis spot	U (ppm)	Th (ppm)	Th/U	f206 (%)	$^{207}\text{Pb}^*/^{206}\text{Pb}^*$	\pm	$^{206}\text{Pb}^*/^{238}\text{U}$	\pm	$^{207}\text{Pb}^*/^{235}\text{U}$	\pm	$^{208}\text{Pb}^*/^{232}\text{Th}$	\pm	conc. (%)	$^{207}\text{Pb}^*/^{206}\text{Pb}^*$ Age (Ma)	\pm (Ma)
Main Group, in order of $^{207}\text{Pb}/^{206}\text{Pb}$ date															
04130B.1-1a	758	3240	4.28	0.000	0.1234	0.0009	0.353	0.050	6.005	0.093	0.1012	0.0017	97	2006	13
04130G.3-1	1190	2620	2.21	0.000	0.1235	0.0007	0.349	0.040	5.942	0.074	0.1037	0.0013	96	2008	10
04130G.4-1	989	1240	1.26	0.096	0.1242	0.0008	0.351	0.042	6.014	0.079	0.1016	0.0014	96	2018	12
04130G.1-6	698	654	0.94	0.045	0.1246	0.0006	0.364	0.052	6.255	0.096	0.1088	0.0022	99	2023	9
04130B.1-6	1130	2070	1.83	0.044	0.1246	0.0005	0.363	0.048	6.241	0.086	0.1087	0.0015	99	2024	7
04130G.4-3	962	1600	1.66	0.059	0.1247	0.0005	0.362	0.049	6.227	0.090	0.1087	0.0016	98	2024	8
04130B.2-1	900	985	1.09	0.069	0.1248	0.0010	0.351	0.044	6.041	0.087	0.1024	0.0015	96	2026	14
04130B.1-3	776	1580	2.04	0.000	0.1248	0.0011	0.363	0.049	6.251	0.098	0.1046	0.0017	99	2026	16
04130G.4-4	919	1070	1.16	0.048	0.1248	0.0006	0.370	0.051	6.363	0.094	0.1096	0.0017	100	2026	8
04130G.1-8	951	861	0.91	0.025	0.1249	0.0006	0.367	0.049	6.326	0.092	0.1095	0.0016	99	2028	9
04130B.2-4	818	956	1.17	0.079	0.1250	0.0007	0.364	0.054	6.267	0.100	0.1109	0.0018	99	2028	10
04130B.2-3	881	1020	1.15	0.101	0.1250	0.0006	0.370	0.051	6.379	0.095	0.1106	0.0018	100	2029	9
04130B.1-1b	720	2940	4.08	0.000	0.1251	0.0014	0.351	0.049	6.053	0.104	0.1039	0.0016	96	2030	20
04130B.3-1	1170	4780	4.08	0.079	0.1251	0.0007	0.355	0.041	6.124	0.077	0.1043	0.0013	96	2030	10
04130B.1-8	1060	1790	1.68	0.052	0.1252	0.0005	0.360	0.048	6.204	0.088	0.1087	0.0016	97	2031	8
04130G.1-1	993	1415	1.43	0.042	0.1252	0.0008	0.358	0.044	6.184	0.083	0.1010	0.0014	97	2031	11
04130G.1-5	804	780	0.97	0.053	0.1252	0.0006	0.360	0.051	6.213	0.093	0.1079	0.0017	98	2032	9
04130G.1-3	548	526	0.96	0.049	0.1252	0.0011	0.352	0.055	6.071	0.106	0.1013	0.0020	96	2032	16
04130B.1-10	1290	2240	1.73	0.058	0.1253	0.0005	0.362	0.046	6.254	0.084	0.1098	0.0016	98	2033	7
04130B.4-1	1420	4880	3.45	0.019	0.1254	0.0007	0.352	0.038	6.085	0.072	0.1054	0.0012	96	2035	10
04130B.1-2	753	991	1.32	0.095	0.1254	0.0010	0.360	0.050	6.223	0.096	0.1048	0.0017	97	2035	14
04130G.2-2	958	1280	1.34	0.017	0.1255	0.0005	0.364	0.049	6.296	0.090	0.1078	0.0016	98	2036	8
04130G.1-4	886	806	0.91	0.060	0.1256	0.0010	0.360	0.047	6.240	0.092	0.1059	0.0020	97	2037	14
04130G.1-7	1130	2150	1.89	0.018	0.1256	0.0005	0.363	0.047	6.291	0.087	0.1090	0.0023	98	2038	7
04130G.4-5	911	1150	1.26	0.016	0.1257	0.0006	0.368	0.050	6.374	0.093	0.1097	0.0016	99	2038	8
04130B.2-2	571	1000	1.76	0.000	0.1258	0.0011	0.354	0.052	6.145	0.102	0.1054	0.0041	96	2040	16
04130B.1-5	1030	1440	1.40	0.059	0.1259	0.0006	0.372	0.050	6.450	0.092	0.1145	0.0026	100	2042	8
04130G.4-2	880	1380	1.57	0.133	0.1259	0.0013	0.362	0.044	6.279	0.096	0.1044	0.0015	97	2042	19
04130B.1-9	1270	1890	1.49	-0.010	0.1262	0.0006	0.354	0.045	6.153	0.084	0.1067	0.0015	95	2045	8
04130G.2-1	909	1220	1.34	0.053	0.1262	0.0008	0.358	0.044	6.224	0.085	0.1047	0.0016	96	2045	12
04130B.1-7	949	1480	1.56	0.065	0.1262	0.0006	0.360	0.049	6.263	0.090	0.1092	0.0016	97	2046	8

Young outlier																
04130G.1-2	588	490	0.83	0.149	0.1216	0.0011	0.355	0.053	5.951	0.100	0.1026	0.0020	99	1980	15	
>5% discordant																
04130B.1-4	1210	2230	1.84	0.000	0.1268	0.0007	0.351	0.041	6.131	0.078	0.1020	0.0015	94	2055	10	
04130G.3-2	314	477	1.52	0.590	0.1191	0.0022	0.402	0.138	6.607	0.259	0.1160	0.0060	112	1942	33	

²⁰⁷Pb/²⁰⁶Pb normalized to z6413 (997 Ma). Analysed 11/01/05 and 04/03/05.

TABLE DR9. SHRIMP U-Pb FOR XENOTIME IN THE WEST RAND GROUP, DRILL-HOLE EVRK20

Analysis spot	U (ppm)	Th (ppm)	Th/U	f206 (%)	$^{207}\text{Pb}^*/^{206}\text{Pb}^*$	\pm	$^{206}\text{Pb}^*/^{238}\text{U}$	\pm	$^{207}\text{Pb}^*/^{235}\text{U}$	\pm	$^{208}\text{Pb}^*/^{232}\text{Th}$	\pm	conc. (%)	Age (Ma)	\pm (Ma)
Main Group, in order of $^{207}\text{Pb}/^{206}\text{Pb}$ date															
B16A.1-10	749	371	0.50	0.000	0.1249	0.0011	0.3839	0.0091	6.61	0.17	0.1088	0.0033	103	2027	15
B16B.2-1	2450	11900	4.9	0.169	0.1256	0.0008	0.3682	0.0073	6.38	0.13	0.1055	0.0042	99	2038	11
B16A.1-7	900	531	0.59	0.000	0.1258	0.0009	0.3703	0.0081	6.42	0.15	0.1060	0.0028	100	2040	13
B16A.1-5	937	700	0.75	0.065	0.1262	0.0010	0.3669	0.0082	6.39	0.15	0.1044	0.0029	98	2046	14
B16A.1-13	2130	1380	0.65	0.072	0.1263	0.0007	0.3797	0.0074	6.61	0.13	0.1099	0.0033	101	2047	9
B16A.1-9	859	415	0.48	0.000	0.1264	0.0010	0.3845	0.0087	6.70	0.16	0.1083	0.0031	102	2049	14
B16A.1-14	3510	1540	0.44	0.021	0.1265	0.0005	0.3856	0.0070	6.73	0.13	0.1114	0.0029	103	2050	7
B16A.1-8	931	639	0.69	0.000	0.1267	0.0009	0.3706	0.0082	6.47	0.15	0.1069	0.0032	99	2052	13
B16A.1-6	650	287	0.44	0.080	0.1267	0.0012	0.3752	0.0090	6.56	0.17	0.1016	0.0052	100	2053	17
B16A.1-12	937	1300	1.4	0.000	0.1267	0.0010	0.3645	0.0082	6.37	0.15	0.1067	0.0040	98	2053	14
B16B.1-2	999	5270	5.3	0.120	0.1271	0.0011	0.3665	0.0083	6.42	0.16	0.1097	0.0046	98	2059	15
B16A.1-4	869	595	0.68	0.107	0.1276	0.0011	0.3716	0.0084	6.54	0.16	0.1063	0.0029	99	2065	15
B16A.1-3	726	224	0.31	0.000	0.1278	0.0012	0.3568	0.0090	6.29	0.17	0.0990	0.0036	95	2068	17
B16A.1-11	716	3250	4.5	0.080	0.1289	0.0012	0.3754	0.0091	6.67	0.17	0.1085	0.0029	99	2083	16
>5% discordant															
B16B.1-1	2500	17300	6.93	0.018	0.1264	0.0006	0.3419	0.0068	5.96	0.12	0.0991	0.0026	93	2048	9
B16B.2-2	1070	2070	1.93	0.145	0.1272	0.0014	0.3522	0.0077	6.18	0.15	0.1031	0.0033	94	2059	19

The "missing" analyses B16A.1-1 and 1-2 were published by Kositsin et al. (2003)

$^{207}\text{Pb}/^{206}\text{Pb}$ normalized to z6413 (997 Ma). Analysed 05/10/05.

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