

Analytical methods:

Geochemical analyses for the USGS were performed by an external laboratory (SGS) using the following methods (Terry Plank, pers. comm. 2011):

Major elements were determined by wavelength dispersive X-ray fluorescence spectrometry. A 2g sample was fused with 50/50 lithium metaborate-lithium tetraborate flux and the resultant glass disk was used for X-ray analysis using a Rhodium X-ray tube source. LOI was determined by gravimetric loss of ignition at 925°C. Calibration curves for each element were derived from a variety of international reference materials (NIST, USGS, CANMET, NIM) and a number of synthetic standards to extend the range for certain elements. Detection limits for all elements including LOI were 0.01%. Data are $\pm 5\%$ relative at the lower detection limit. The calculated percent relative standard deviation (RSD) of duplicate samples was no greater than 5%.

Trace elements were determined by inductively coupled plasma-atomic emission spectrometry (ICP-AES) and inductively coupled plasma-mass spectrometry (ICP-MS). The sample was decomposed using a sodium peroxide sinter at 450°C. The resultant cake was leached with water and acidified with nitric acid. After an addition of tartaric acid, aliquots of the digested sample were aspirated into the ICP-AES and the ICP-MS. The concentrations of the optimal elements from the ICP-AES and ICP-MS were determined during analysis. Calibration on the ICP-AES was performed by standardizing with digested rock reference materials and multi-element solution standards. The ICP-MS was calibrated with aqueous standards and internal standards were used to compensate for matrix affects and internal drifts. Sample weight was 0.1g. Data are $\pm 15\%$ at five times the lower limit of determination and the calculated RSD of duplicate samples was no greater than 15%.

Repository: SHRIMP spot analyses

Grains/ Spots	Interp	U (ppm)	Th (ppm)	Th/U	% comm ^{206}Pb	$^{206}\text{Pb}/$ $^{238}\text{U}^{\#}$	$\pm^{206}\text{Pb}/$ $^{238}\text{U}^{\$}$	$^{207}\text{Pb}/$ $^{235}\text{U}^{\#}$	$\pm^{207}\text{Pb}/$ $^{235}\text{U}^{\$}$	$^{207}\text{Pb}/$ $^{206}\text{Pb}^{\#}$	$\pm^{207}\text{Pb}/$ $^{206}\text{Pb}^{\$}$	^{206}Pb Age Ma	$\pm^{207}\text{Pb}/$ ^{206}Pb Age Ma \pm	% Discord [†]
WRP (81-25 WQM; igneous age 1628 +/- 11 Ma (MSWD 0.25); UTM NAD27 13 T 368786 4540715)														
1	ig	306	153	0.50	0.00	0.2845	0.5	3.94	1.0	0.1003	0.9	1630	16	1
2	ig	198	68	0.35	0.04	0.2877	0.6	3.95	1.0	0.0995	0.8	1615	15	-1
3	ig	262	117	0.45	0.06	0.2830	0.6	3.90	0.9	0.0999	0.7	1622	14	1
4	ig	121	39	0.32	0.84	0.2545	0.9	3.53	5.3	0.1006	5.3	1636	98	12
5	ig	182	53	0.29	0.04	0.2844	0.7	3.95	1.0	0.1006	0.8	1636	14	1
6	ig	289	96	0.33	0.39	0.2728	0.5	3.77	1.1	0.1003	0.9	1629	17	5
7	ig	176	57	0.33	0.00	0.2751	0.7	3.82	1.1	0.1007	0.8	1638	15	5
8	ig	236	104	0.44	0.00	0.2812	0.6	3.88	0.9	0.1001	0.7	1626	13	2
SM294 (WQM; igneous age 1645 +/- 7 Ma (MSWD 0.36), cores 1784 +/- 5 Ma (MSWD 0.56); UTM NAD27 13 T 373167 4541338)														
1	core	614	193	0.31	0.20	0.3024	0.4	4.52	0.7	0.1084	0.6	1772	10	4
2.1	rim	1810	42	0.02	1.81	0.2103	0.3	2.82	1.1	0.0973	1.1	1572	20	28
2.2	core	711	211	0.30	0.01	0.3347	0.4	5.04	0.5	0.1092	0.4	1786	7	-4
3	core	1055	420	0.40	0.00	0.3264	0.3	4.90	0.5	0.1089	0.3	1781	6	-2
4	core	1469	781	0.53	0.00	0.3219	0.3	4.85	0.4	0.1094	0.3	1789	5	-1
5	core	1039	361	0.35	0.00	0.3198	0.3	4.81	0.5	0.1091	0.3	1784	6	0
6	core	490	129	0.26	0.03	0.3210	0.5	4.83	0.7	0.1091	0.5	1785	10	-1
7	rim	1537	42	0.03	0.16	0.2886	0.3	4.02	0.5	0.1011	0.4	1644	8	1
8	rim	1399	56	0.04	0.10	0.3007	0.3	4.18	0.5	0.1008	0.4	1639	8	-3
9	rim	1565	39	0.02	0.03	0.2959	0.3	4.13	0.4	0.1011	0.3	1645	6	-2
10	core	472	122	0.26	0.00	0.3092	0.5	4.63	0.7	0.1085	0.5	1775	9	2
11	rim	1569	36	0.02	0.02	0.2942	0.3	4.11	0.4	0.1013	0.3	1649	6	-1
SM329 (WQM pegmatite; igneous age 1631 +/- 8 Ma (MSWD 0.36); UTM NAD27 13 T 358511 4543476)														
1	ig	300	50	0.17	0.23	0.2551	0.5	3.52	1.0	0.1001	0.8	1626	15	11
2	ig	351	75	0.21	0.06	0.2877	0.5	3.98	0.8	0.1004	0.7	1632	12	0
3	ig	299	117	0.39	0.03	0.2761	0.6	3.80	0.8	0.0998	0.6	1620	12	3
4	ig	294	110	0.38	0.50	0.2820	0.6	3.96	1.1	0.1020	0.9	1660	18	4
5	ig	356	121	0.34	0.06	0.2839	0.5	3.94	0.8	0.1006	0.6	1635	11	2
6	ig	340	411	1.21	5.44	0.1967	0.6	2.76	2.8	0.1019	2.7	1659	51	43
7	ig	527	75	0.14	0.02	0.2839	0.4	3.96	0.6	0.1011	0.5	1644	9	2
8	ig	315	116	0.37	0.00	0.2844	0.5	3.94	0.8	0.1004	0.6	1632	11	1

9	ig	247	55	0.22	0.03	0.2950	0.6	4.10	1.1	0.1008	0.9	1639	17	-2
10	ig	284	125	0.44	0.41	0.2952	0.6	4.05	1.4	0.0995	1.3	1616	24	-3
11	ig	465	150	0.32	0.07	0.2786	0.5	3.80	0.7	0.0990	0.6	1606	10	1
12	ig	434	288	0.66	8.56	0.2261	0.8	3.21	9.1	0.1031	9.1	1681	167	28

SM063 (amphibolite; metamorphic age 1627 +/- 4 Ma (MSWD 1.5); UTM NAD27 13 T 360867 4544869)

1	met	1208	13	0.01	0.00	0.2453	0.3	3.42	0.4	0.1012	0.3	1646	6	16
2	met	978	13	0.01	0.00	0.2600	0.3	3.61	0.4	0.1008	0.3	1638	6	10
3	met	1138	209	0.18	0.11	0.2461	0.3	3.41	0.5	0.1004	0.4	1632	7	15
4.1	met	1086	60	0.06	0.02	0.2730	0.3	3.75	0.4	0.0998	0.3	1620	6	4
4.2	met	668	18	0.03	0.03	0.2762	0.4	3.82	0.5	0.1002	0.4	1628	8	4
5	met	744	11	0.01	0.01	0.2642	0.3	3.61	0.5	0.0991	0.4	1608	7	6
6	met	1005	13	0.01	0.02	0.2708	0.3	3.74	0.5	0.1002	0.3	1627	6	5
7	met	915	11	0.01	0.02	0.2736	0.3	3.77	0.5	0.1001	0.3	1625	6	4
8	met	1192	14	0.01	0.01	0.2616	0.3	3.61	0.6	0.1000	0.5	1625	10	8
9	met	1178	29	0.02	0.02	0.2592	0.3	3.57	0.4	0.1000	0.3	1625	6	9
10	met	904	36	0.04	0.18	0.2587	0.3	3.56	0.5	0.0997	0.4	1619	8	9
11	met	945	41	0.04	0.08	0.2680	0.3	3.70	0.5	0.1001	0.4	1625	8	6
12	met	914	18	0.02	0.03	0.2678	0.3	3.70	0.5	0.1001	0.3	1626	6	6
13	met	1993	33	0.02	0.10	0.2401	0.2	3.32	0.4	0.1004	0.3	1632	6	18
14	met	553	66	0.12	0.10	0.2486	0.4	3.44	0.7	0.1004	0.5	1632	9	14
15	met	1172	41	0.03	0.11	0.2694	0.3	3.71	0.4	0.1000	0.3	1623	6	6
16	met	920	9	0.01	0.01	0.2740	0.3	3.79	0.5	0.1004	0.3	1631	6	4
17	met	1229	209	0.17	0.01	0.2489	0.3	3.43	0.4	0.0998	0.3	1621	6	13
18	met	1037	12	0.01	0.00	0.2555	0.3	3.53	0.4	0.1003	0.3	1629	6	11
19	met	566	19	0.03	0.14	0.2397	0.4	3.29	0.8	0.0995	0.7	1615	12	17
20	met	671	12	0.02	0.02	0.2557	0.4	3.54	0.6	0.1003	0.5	1629	8	11

Notes:

* common Pb.

atomic ratios corrected for initial Pb using amount of ^{204}Pb and corresponding average Earth values from Stacey and Kramers (1975)

\pm errors given at 1 sigma level

\dagger degree of discordance, percentage of distance that analysis lies along a chord from its extrapolated intersection with concordia (corresponding to its $^{207}\text{Pb}/^{206}\text{Pb}$ age) to the origin at 0 Ma.

Interpretation: ig = igneous crystallization age; nu = not used in calculations (mixed or metamorphic age);