Supporting Information for:

THE KINEMATICS AND DYNAMICS OF RIFTING IN SOUTH-CENTRAL TIBET

by

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Introduction
The supporting information includes supplementary data tables and figures that provide detailed information on sample locations and lithologies, raw U-Pb data and weighted mean plots for all samples, raw zircon (U-Th)/He thermochronology data, age-grain size plots, and age-effective uranium plots for all samples, HeFTy modeling results, and detailed methods and data tables for the zircon (U-Th)/He thermochronology data compilation in Chapter 3.

Figure S1. Compilation of previous studies reporting geo- and thermochronology data in and around the Tangra Yumco Rift.
Figure S2. Igneous zircon U-Pb weighted mean plots for all samples.
Figure S3. Zircon (U-Th)/He thermochronology plots of age versus grain size and age versus effective uranium (eU).
Figure S4. Complete HeFTy thermal modeling results for all samples with both Igneous Zircon U-Pb data results and Zircon (U-Th)/He thermochronology data results.

Table S1. Sample location and lithology data.
Table S2. Igneous zircon U-Pb data.
Table S3. Zircon (U-Th)/He thermochronology data.
Table S4. Zircon (U-Th)/He thermochronology data compilation, methods, and sources
Table S5. Zircon (U-Th)/He thermochronology data.

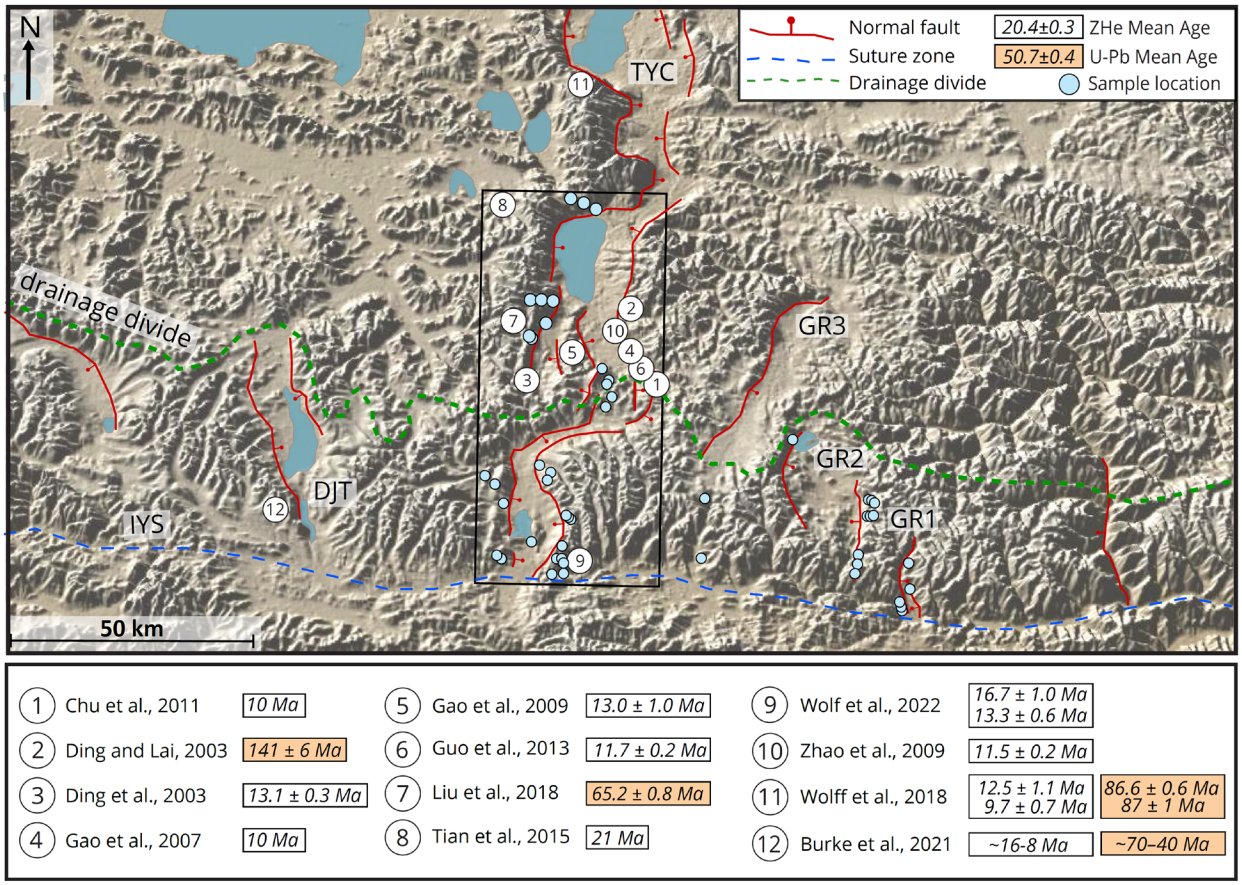


Figure S1. Digital elevation model of the South-Central Tibetan Plateau, showing locations of the drainage divide along the crest of the Gangdese Range (green), Tangra Yumco Rift (TYC; Wolff et al., 2018; this study), Gangdese Rifts cutting the high topography of the Gangdese Range including the Daijaimang Tso rift (DJT; Burke et al., 2021) and other previously unnamed rifts (e.g., GR1, GR2, GR3). The black box shows the extent of geologic mapping in South TYC (Fig. 5). Suture zones shown as dashed blue lines; BNS = Bangong- Nujiang suture; IYS = Indus-Yarlung suture. The black box shows the extent of geologic mapping in South TYC (Fig. 5). Fault traces primarily from HimaTibet database (Styron et al. 2010). Topography from GeoMapApp, VE = 4. Data source: Tibetan Magmatism Database, Chapman & Kapp, 2017 (doi: 10.1002/2017GC007217).

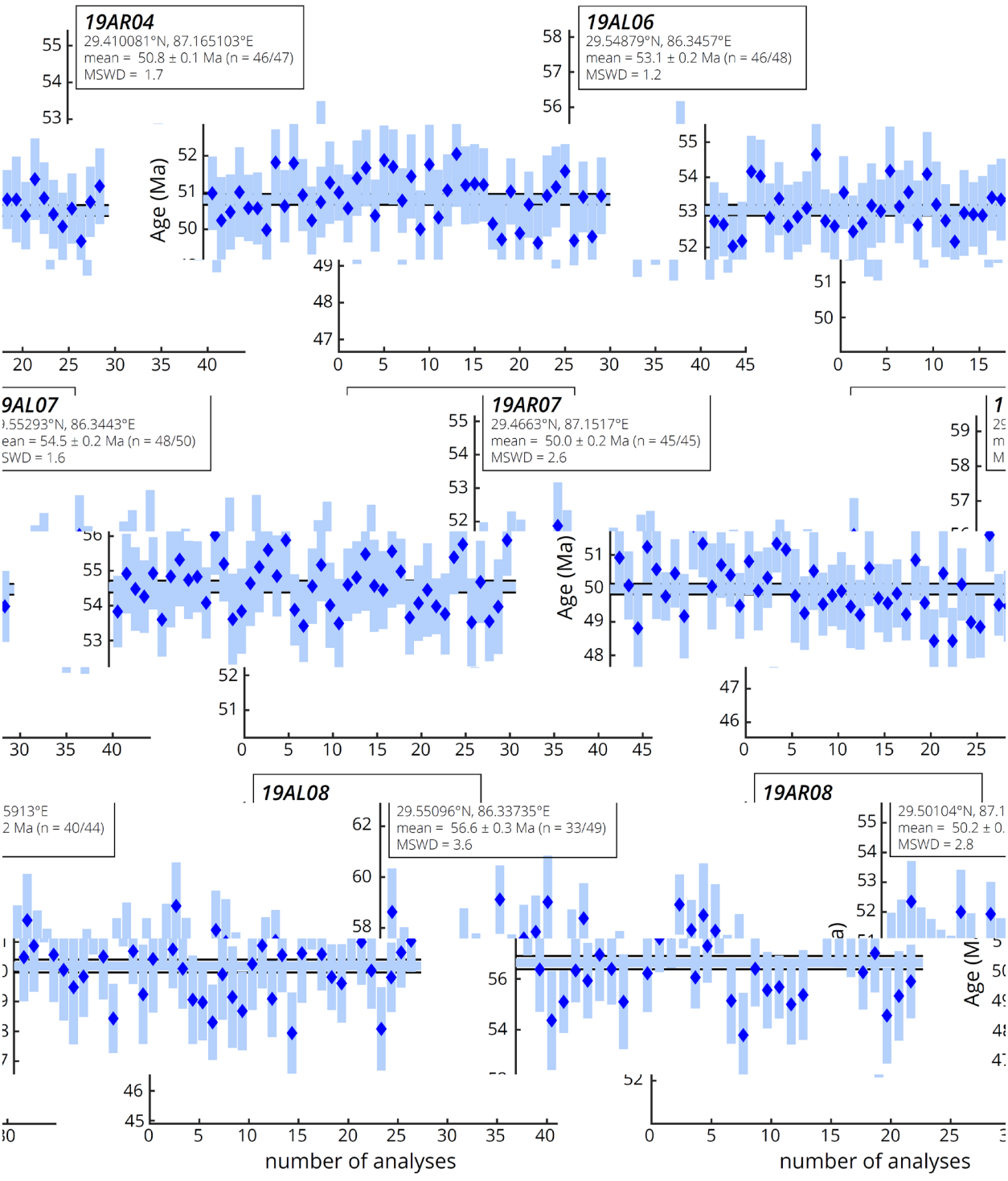


Figure S2. Igneous zircon U-Pb weighted mean age plots for samples collected from TYC and Gangdese (19AR04, 19AR07, 19AR08) rift footwalls. Ages reflect the timing of latest crystallization with plots for samples 19AR11, 19AR25, and 19AR26 representing youngest age populations (Fig. 6). Grains with >1000 ppm Uranium and ages outside of 2σ error were considered outliers and not plotted or included in MSWD calculations. Sample locations shown on geologic map (Fig. 4).

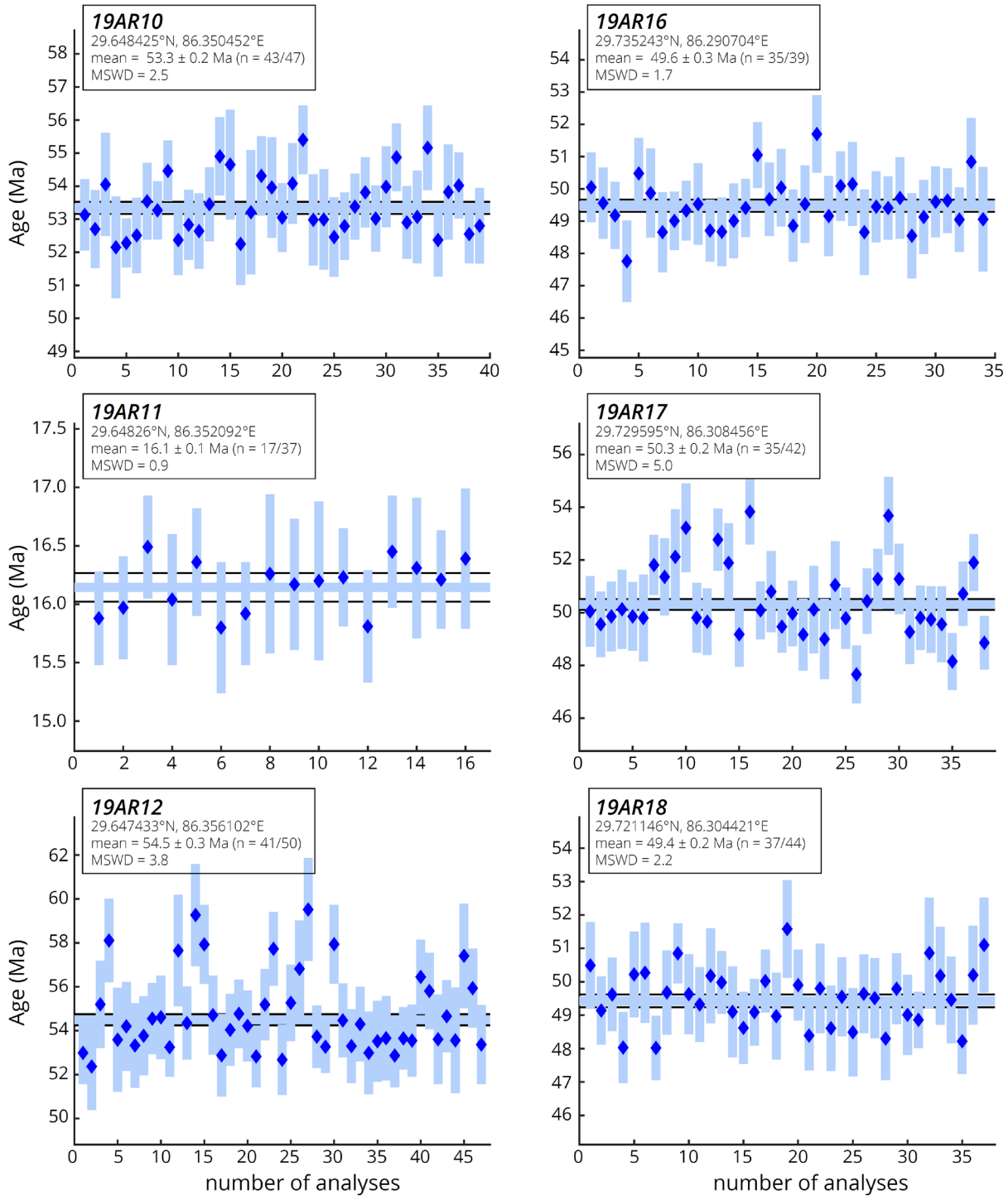


Figure S2 (continued). Igneous zircon U-Pb weighted mean age plots for samples collected from TYC and Gangdese (19AR04, 19AR07, 19AR08) rift footwalls. Ages reflect the timing of latest crystallization with plots for samples 19AR11, 19AR25, and 19AR26 representing youngest age populations (Fig. 6). Grains with >1000 ppm Uranium and ages outside of 2σ error were considered outliers and not plotted or included in MSWD calculations. Sample locations shown on geologic map (Fig. 4).

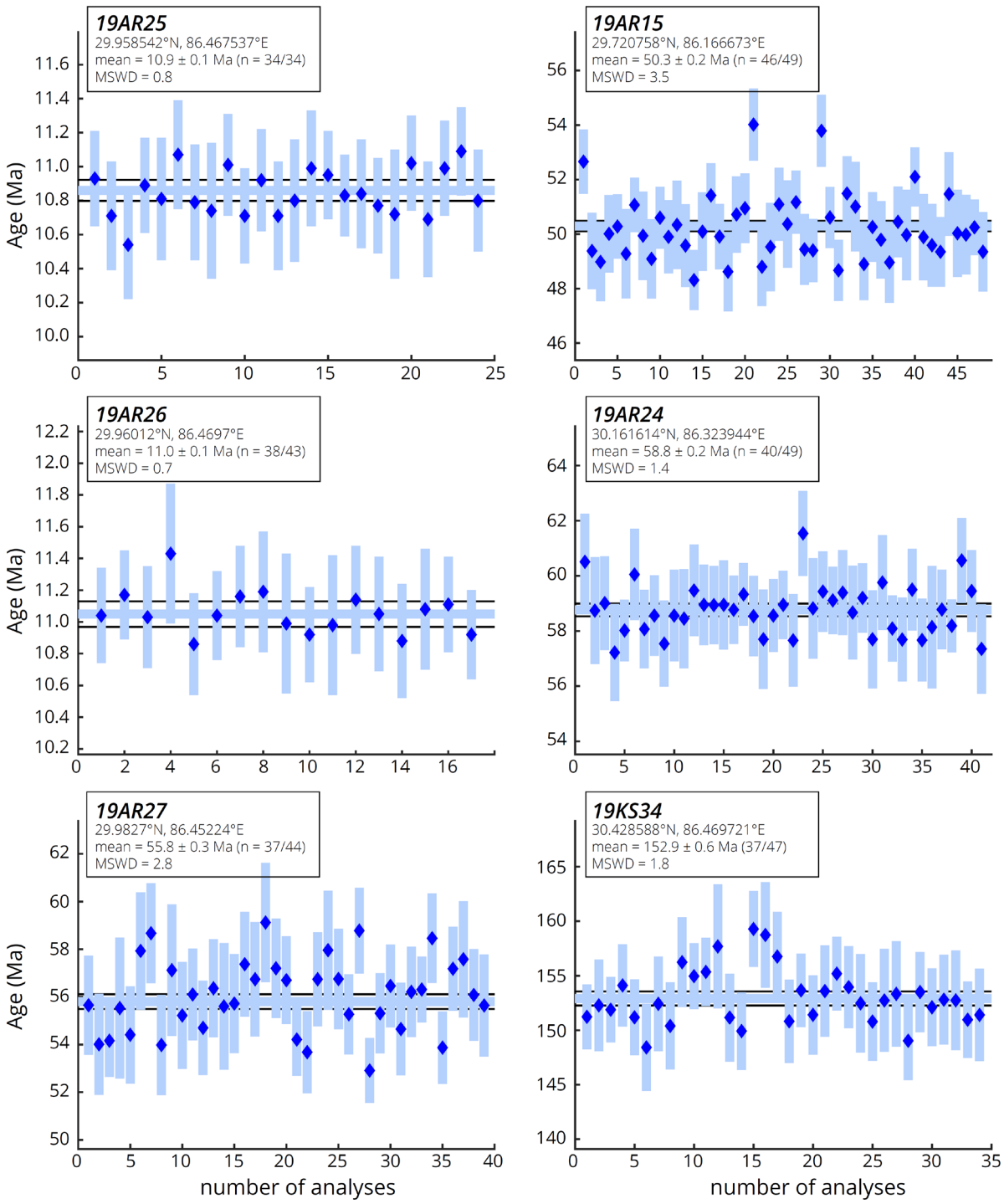


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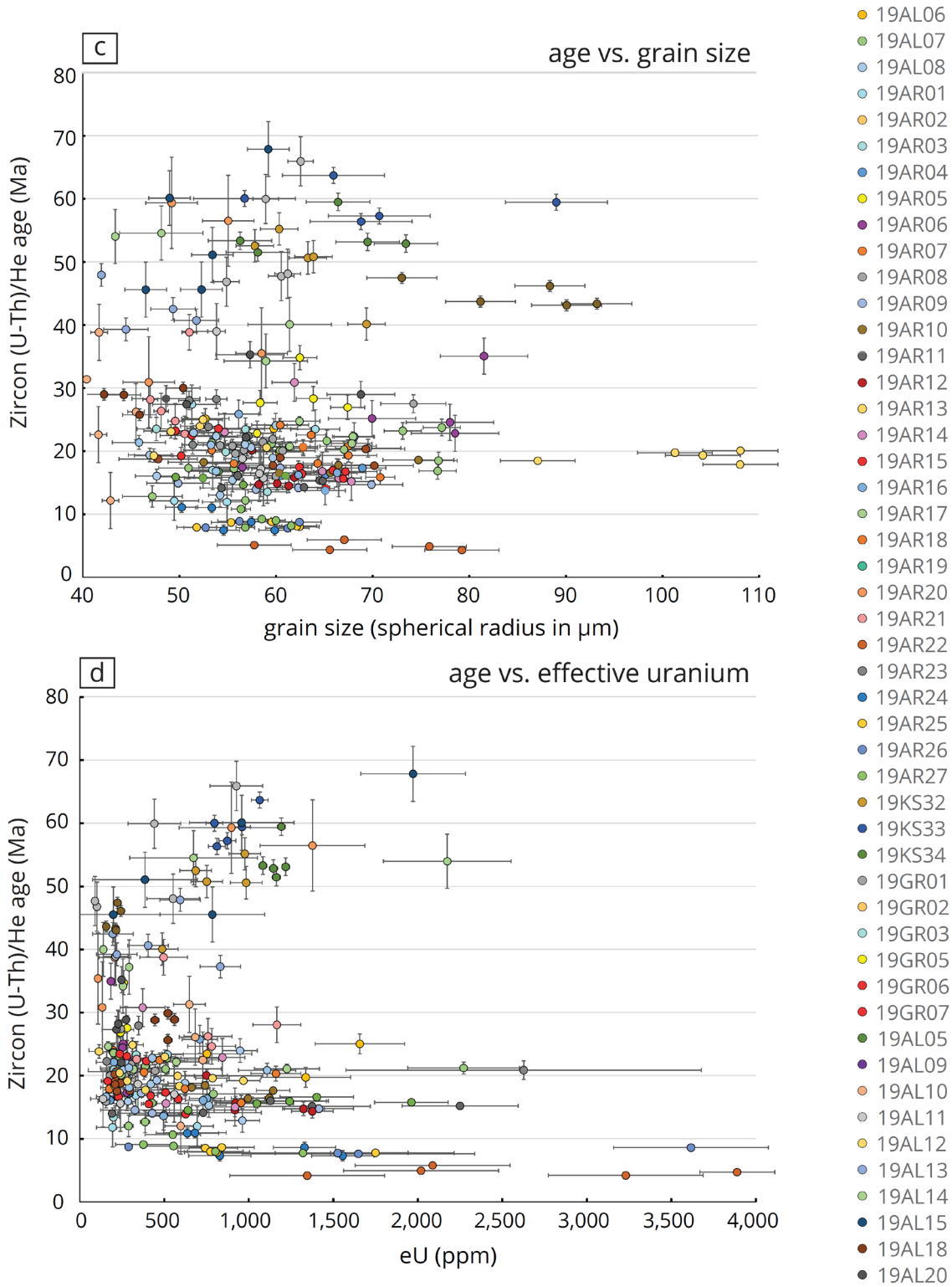


Figure S3. Plots of (c) zircon (U-Th)/He (ZHe) age versus grain size and (d) ZHe age versus effective uranium (eU), indicating no clear correlation between age and grain size or age and effective uranium. Sample locations are shown on geologic map (Fig. 4) and reported in supplementary data (Table S1).

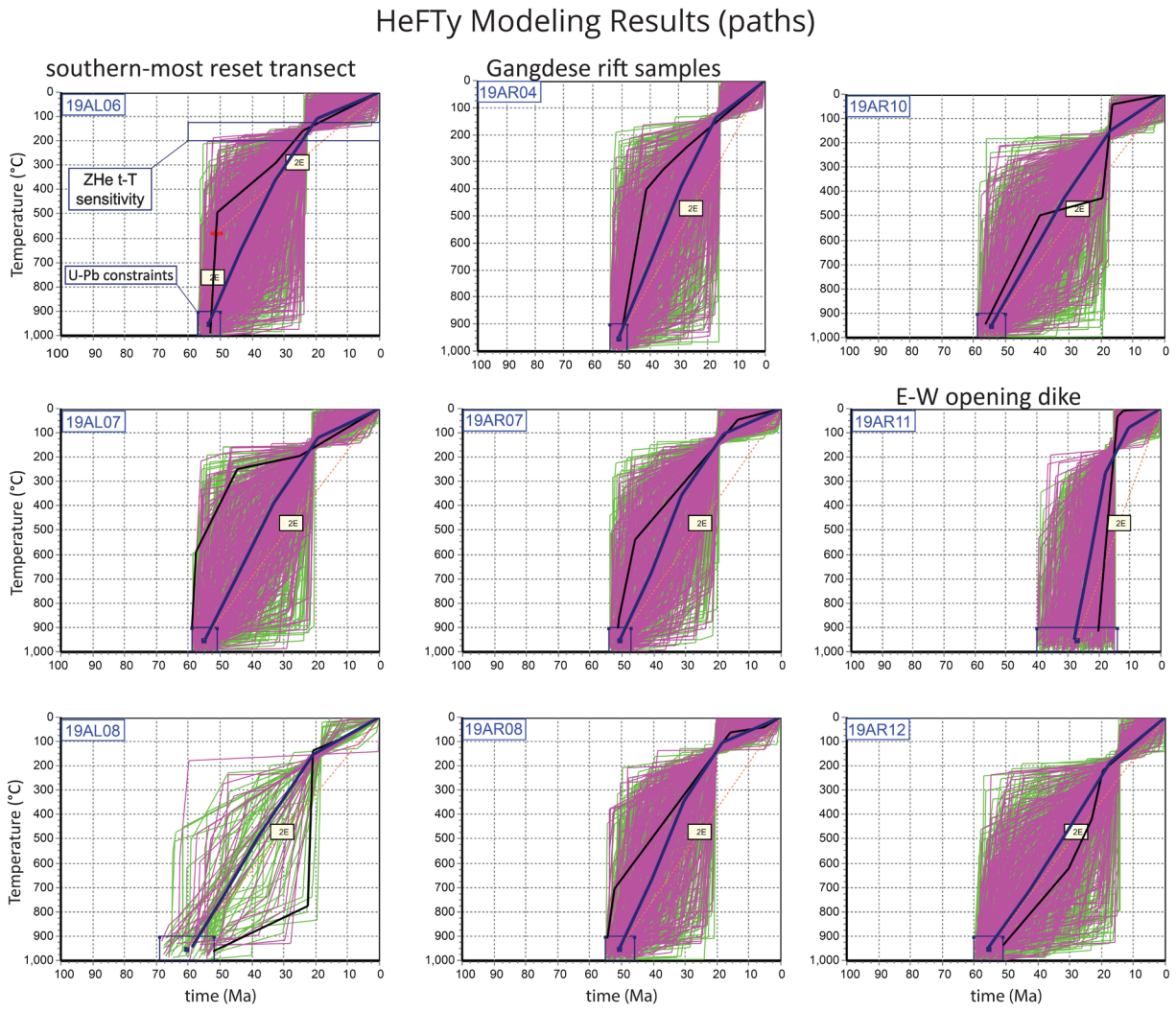
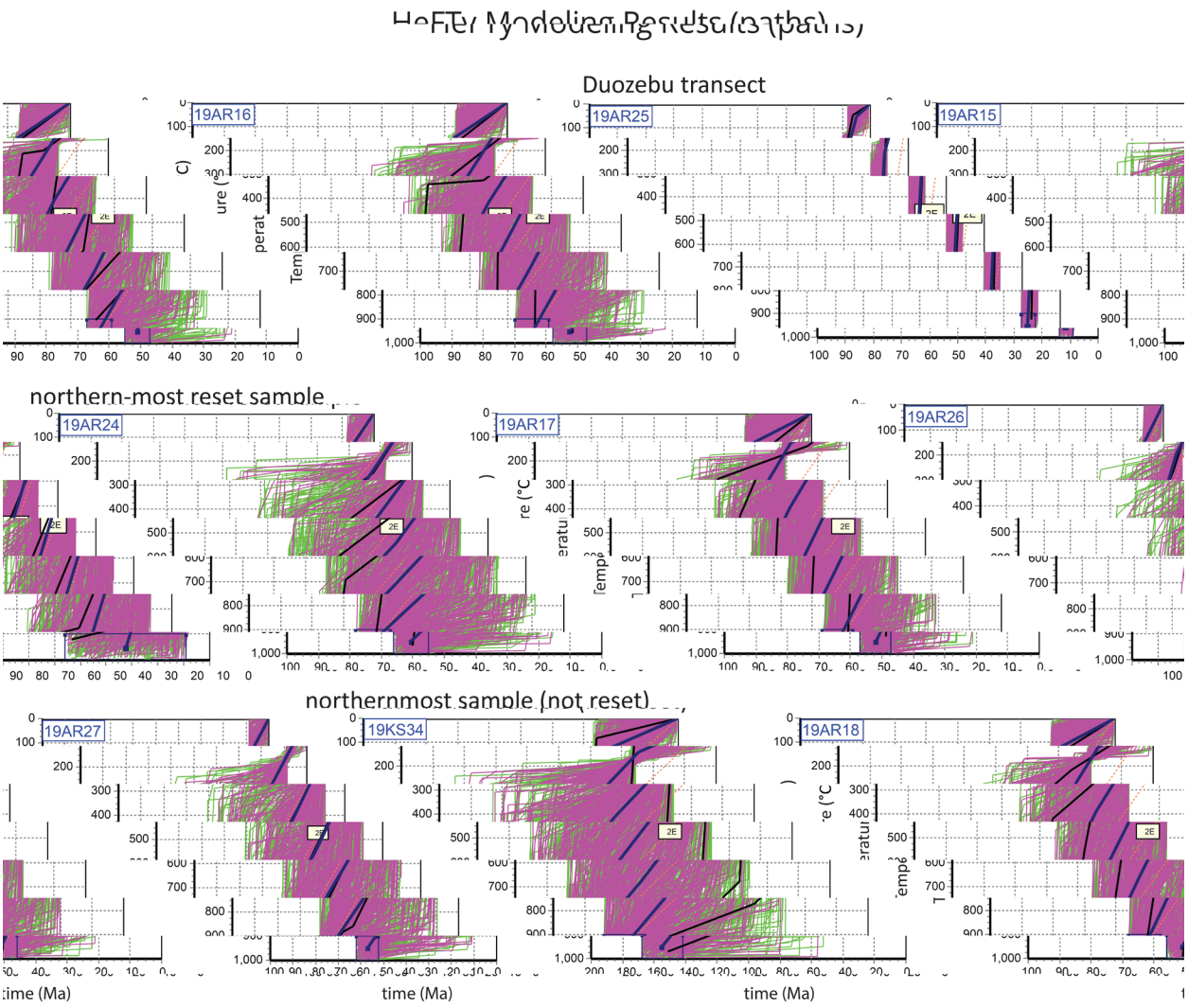


Figure S4: HeFTy models for samples from the TYC rift showing best fit (black), weighted mean (dark blue), good fit (pink), and acceptable fit (green) paths. Model paths (n= 50,000) initiate within time-Temperature constraints from U-Pb dating (>900°C, blue boxes). Paths end at the surface (20–0°C) at present day (0 Ma) and are dominantly constrained by ZHe t-T sensitivities established by age and diffusion parameters specific to the median grain for each sample.



best fit
weighted mean
good fit
acceptable fit

Figure S4 (continued): HeFTy models for samples from the TYC rift showing best fit (black), weighted mean (dark blue), good fit (pink), and acceptable fit (green) paths. Model paths (n= 50,000) initiate within time-Temperature constraints from U-Pb dating (>900°C, blue boxes). Paths end at the surface (20–0°C) at present day (0 Ma) and are dominantly constrained by ZHe t-T sensitivities established by age and diffusion parameters specific to the median grain for each sample.

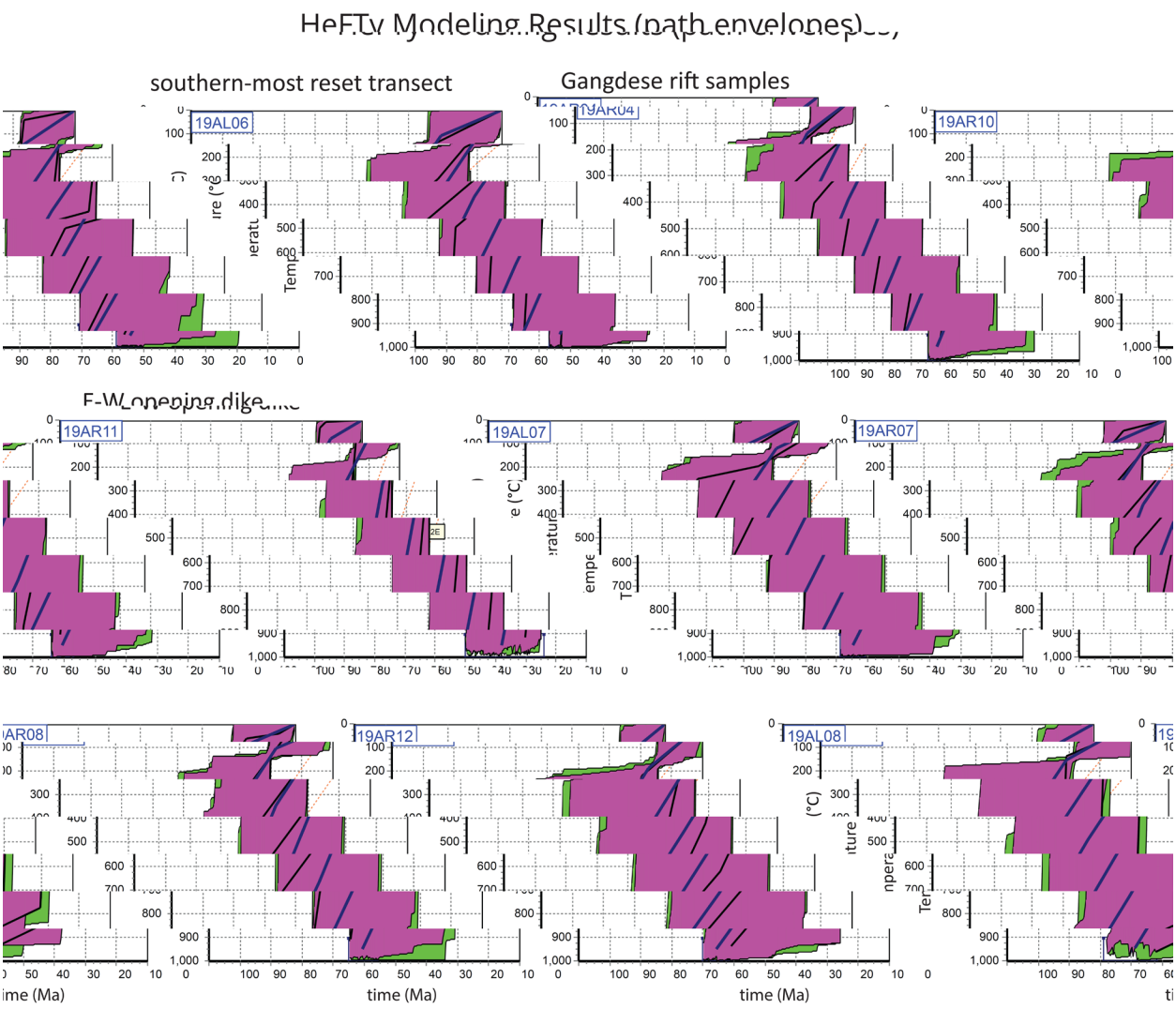
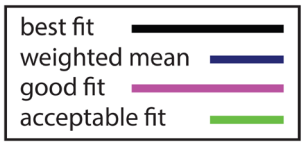


Figure S4 (continued): HeFTy models for samples from the TYC rift showing best fit (black), weighted mean (dark blue), good fit (pink), and acceptable fit (green) paths and path envelopes. Model paths (n= 50,000) initiate within time-Temperature constraints from U-Pb dating (>900°C, blue boxes). Paths end at the surface (20–0°C) at present day (0 Ma) and are dominantly constrained by ZHe t-T sensitivities established by age and diffusion parameters specific to the median grain for each sample.



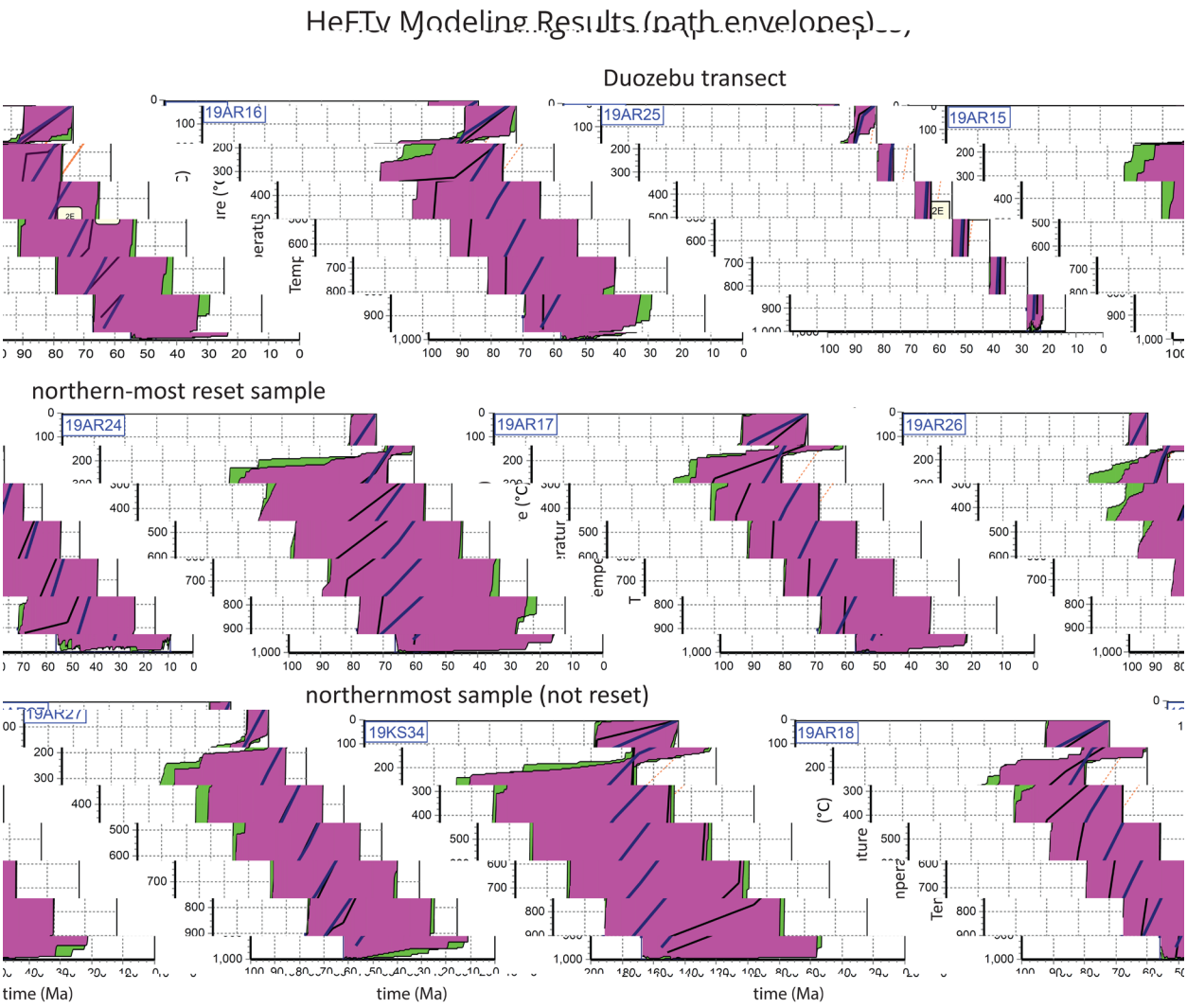


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Table S1. Sample Location and Lithology

Sample Name	Latitude (°N)	Longitude (°E)	Elevation (m)	Lithology	Unit abv.
19AL05	29.54241	86.34583	5507	Lithic Sandstone	OMk
19AL06	29.54879	86.3457	5855	Granodiorite	Gg
19AL07	29.55293	86.3443	5786	Granodiorite	Gg
19AL08	29.55096	86.33735	5608	Granodiorite	Gg
19AL09	29.52943	86.313648	5002	Lithic Sandstone	KPq
19AL10	29.55081	86.21104	5058	Quartz Sandstone	KPq
19AL11	29.54633	86.21975	4963	Conglomerate	KPq
19AL12	30.079375	86.301463	5011	Porphyritic Rhyolite	KPlz
19AL13	30.079922	86.300655	5052	Porphyritic Andesite	KPlz
19AL14	30.11307	86.33408	5161	Porphyritic Andesite	KPlz
19AL15	29.545693	86.667312	4675	Granodiorite	Gg
19AL18	29.640538	86.699153	5036	Granodiorite	Gg
19AL20	29.808505	86.918758	5006	Porphyritic Andesite	KPlz
19AR01	29.510315	87.033703	4817	Granodiorite	Gg
19AR02	29.498585	87.031647	5171	Granodiorite	Gg
19AR03	29.4854	87.02821	5318	Granodiorite	Gg
19AR04	29.410081	87.165103	4379	Porphyritic Andesite	KPlz
19AR05	29.423917	87.163843	4410	Granodiorite	Gg
19AR06	29.434158	87.158032	4442	Granodiorite	Gg
19AR07	29.4663	87.1517	4546	Granodiorite	Gg
19AR08	29.50104	87.15913	4722	Granodiorite	Gg
19AR09	29.562388	86.330188	5374	Granodiorite	Gg
19AR10	29.648425	86.350452	5367	Granodiorite	Gg
19AR11	29.64826	86.352092	5424	Porphyritic Andesite	KPlz
19AR12	29.647433	86.356102	5524	Granodiorite	Gg
19AR13	29.667639	86.206924	5000	Granodiorite	Gg
19AR14	29.706723	86.181639	5324	Granodiorite	Gg
19AR15	29.720758	86.166673	5536	Granodiorite	Gg
19AR16	29.735243	86.290704	4957	Granodiorite	Gg
19AR17	29.729595	86.308456	5212	Granodiorite	Gg
19AR18	29.721146	86.304421	5109	Granodiorite	Gg
19AR19	29.913056	86.46747	5489	Felsic Tuff	KPlz
19AR20	29.898924	86.459042	5282	Porphyritic Andesite	KPlz
19AR21	29.590239	86.269258	4776	Granodiorite	Gg
19AR22	30.162284	86.355441	5043	Granodiorite	Gg
19AR23	30.1626	86.34021	5217	Granodiorite	Gg
19AR24	30.161614	86.323944	5275	Porphyritic Andesite	KPlz
19AR25	29.958542	86.467537	5615	Porphyritic Andesite	KPlz
19AR26	29.96012	86.4697	5539	Granodiorite	Gg
19AR27	29.9827	86.45224	5369	Granodiorite	Gg
19GR01	29.634465	87.065858	4949	Porphyritic Andesite	KPlz
19GR02	29.634643	87.073496	5329	Porphyritic Andesite	KPlz
19GR03	29.636049	87.078411	5405	Porphyritic Andesite	KPlz
19GR05	29.65357	87.07273	5003	Porphyritic Andesite	KPlz
19GR06	29.65039	87.07893	5308	Porphyritic Andesite	KPlz
19GR07	29.64614	87.0834	5595	Porphyritic Andesite	KPlz
19KS32	30.423606	86.487434	4963	Granodiorite	Gg
19KS33	30.427349	86.477097	5307	Granodiorite	Gg
19KS34	30.428588	86.469721	5452	Granite	Gg

Table S2. U/Pb igneous zircon geochronologic analyses by LA-ICP-MS

Analysis	Isotope Ratios										Apparent Ages (Ma)								
	U (ppm)	206Pb 204Pb	U/Th	206Pb* 207Pb*	± 1σ (%)	207Pb* 235U	± 1σ (%)	206Pb* 238U	± 1σ (%)	error corr.	206Pb* 238U	± 1σ (Ma)	207Pb* 235U	± 1σ (Ma)	206Pb* 207Pb*	± 1σ (Ma)	**Best Age (Ma)**	**± 1σ (Ma)**	% conc
Sample 19AL06: (Lat/Long: 29.54879, 86.3457)–NAD 1983 coordinate system																			
19AL06 Spot 1	280.61	27664.66	1.81	21.15	1.58	0.05	1.91	0.01	1.07	0.56	52.74	0.56	52.06	0.97	21.06	NA	52.74	0.56	250.40
19AL06 Spot 2	517.28	28142.04	1.40	21.09	1.43	0.05	1.67	0.01	0.85	0.51	52.65	0.45	52.15	0.85	28.98	NA	52.65	0.45	181.70
19AL06 Spot 3	359.16	5146.36	1.49	12.73	6.32	0.09	6.71	0.01	1.37	0.20	55.34	0.75	87.04	5.60	1076.38	132.11	55.34	0.75	5.14
19AL06 Spot 4	387.45	1440182.17	1.55	21.03	1.03	0.05	1.33	0.01	0.84	0.63	52.03	0.43	52.23	0.68	61.45	24.61	52.03	0.43	84.67
19AL06 Spot 5	294.22	16983.56	0.98	21.04	1.49	0.05	1.86	0.01	1.07	0.58	52.18	0.56	51.42	0.93	16.20	NA	52.18	0.56	322.09
19AL06 Spot 6	302.30	6978.08	1.20	20.94	1.36	0.05	2.86	0.01	0.95	0.33	54.16	0.51	52.25	1.45	NA	NA	54.16	0.51	NA
19AL06 Spot 7	203.53	6871.47	1.51	21.03	2.15	0.05	2.43	0.01	0.97	0.40	54.03	0.52	52.01	1.23	NA	NA	54.03	0.52	NA
19AL06 Spot 8	317.15	22864.37	1.84	21.37	1.41	0.05	1.83	0.01	0.93	0.51	52.84	0.49	51.70	0.92	-0.88	NA	52.84	0.49	-6000.81
19AL06 Spot 9	460.36	189725.73	1.53	20.98	1.58	0.05	1.86	0.01	0.97	0.52	53.39	0.52	53.81	0.97	72.34	37.55	53.39	0.52	73.81
19AL06 Spot 10	176.83	45686.63	1.09	21.13	2.50	0.05	2.74	0.01	1.13	0.41	52.60	0.59	52.41	1.40	43.77	NA	52.60	0.59	120.17
19AL06 Spot 11	337.94	20095.58	0.65	21.14	1.88	0.05	2.12	0.01	0.95	0.45	52.87	0.50	52.24	1.08	23.30	NA	52.87	0.50	226.95
19AL06 Spot 12	330.53	12155.04	0.67	21.26	1.51	0.05	1.68	0.01	0.70	0.42	50.89	0.35	49.53	0.81	NA	NA	50.89	0.35	NA
19AL06 Spot 13	252.91	9162.12	1.68	17.89	2.32	0.06	2.54	0.01	0.98	0.38	53.12	0.52	60.93	1.50	379.64	52.83	53.12	0.52	13.99
19AL06 Spot 14	148.47	28597.58	1.33	20.55	2.88	0.06	3.22	0.01	1.40	0.43	54.65	0.76	55.72	1.74	102.19	68.56	54.65	0.76	53.48
19AL06 Spot 15	414.56	129300.96	1.41	20.99	1.66	0.05	1.87	0.01	0.86	0.46	52.75	0.45	53.15	0.97	71.16	39.56	52.75	0.45	74.13
19AL06 Spot 18	451.41	55462.28	1.39	21.16	1.21	0.05	1.56	0.01	0.98	0.63	52.45	0.51	52.24	0.79	42.60	28.95	52.45	0.51	123.12
19AL06 Spot 19	377.39	50457.07	1.40	21.10	1.35	0.05	1.74	0.01	1.09	0.63	52.69	0.57	52.60	0.89	48.34	32.31	52.69	0.57	109.00
19AL06 Spot 20	114.83	3253.55	1.20	19.69	2.74	0.05	4.18	0.01	1.14	0.27	53.19	0.60	52.14	2.13	4.17	NA	53.19	0.60	1274.42
19AL06 Spot 21	253.60	153958.88	1.61	20.61	1.94	0.05	2.12	0.01	0.85	0.40	53.03	0.45	54.34	1.12	112.36	45.76	53.03	0.45	47.20
19AL06 Spot 22	326.77	19251.21	1.46	21.46	1.46	0.05	2.05	0.01	1.16	0.57	54.18	0.63	52.59	1.05	NA	NA	54.18	0.63	NA
19AL06 Spot 23	152.01	4865.41	0.93	21.92	2.63	0.05	3.45	0.01	0.99	0.29	53.16	0.52	48.02	1.62	NA	NA	53.16	0.52	NA
19AL06 Spot 24	296.73	24966.62	1.95	20.54	1.45	0.06	1.68	0.01	0.84	0.50	53.57	0.45	54.51	0.89	95.66	34.43	53.57	0.45	56.01
19AL06 Spot 25	131.60	26435.86	1.23	20.57	2.87	0.05	3.12	0.01	1.21	0.39	52.64	0.63	53.53	1.62	93.51	68.04	52.64	0.63	56.29
19AL06 Spot 26	200.78	10364.26	1.19	21.35	2.33	0.05	2.59	0.01	1.11	0.43	54.09	0.60	52.03	1.31	NA	NA	54.09	0.60	NA
19AL06 Spot 27	96.97	6848.07	1.00	22.51	2.95	0.05	3.26	0.01	1.15	0.35	53.22	0.61	47.74	1.52	NA	NA	53.22	0.61	NA
19AL06 Spot 28	238.22	40578.15	1.51	17.48	2.00	0.07	2.15	0.01	0.79	0.37	57.37	0.45	68.55	1.43	478.62	44.25	57.37	0.45	11.99
19AL06 Spot 29	335.84	74214.36	1.76	21.15	1.91	0.05	2.14	0.01	0.98	0.46	52.76	0.52	52.59	1.10	44.75	45.53	52.76	0.52	117.91
19AL06 Spot 30	1519.51	35301.51	1.57	20.98	0.85	0.06	1.22	0.01	0.87	0.71	56.09	0.48	56.00	0.66	52.03	20.38	56.09	0.48	107.81
19AL06 Spot 31	428.35	104354.72	1.69	21.74	1.56	0.05	1.82	0.01	0.93	0.51	52.16	0.48	50.68	0.90	NA	NA	52.16	0.48	NA
19AL06 Spot 32	171.44	8383.04	0.80	20.42	1.72	0.05	2.11	0.01	1.16	0.55	52.98	0.61	52.94	1.09	51.19	41.91	52.98	0.61	103.50
19AL06 Spot 33	349.63	14899.43	1.67	21.60	1.69	0.05	1.94	0.01	0.88	0.45	52.94	0.46	50.80	0.96	NA	NA	52.94	0.46	NA
19AL06 Spot 34	235.48	8027.41	0.83	20.53	1.93	0.05	2.24	0.01	1.06	0.48	52.91	0.56	52.50	1.14	33.79	NA	52.91	0.56	156.61
19AL06 Spot 35	178.72	24481.85	1.16	21.63	1.74	0.05	1.99	0.01	0.88	0.44	53.42	0.47	51.63	1.00	NA	NA	53.42	0.47	NA
19AL06 Spot 36	365.79	448376.89	1.30	20.45	1.15	0.06	1.59	0.01	1.09	0.69	53.36	0.58	55.08	0.85	130.27	27.02	53.36	0.58	40.96
19AL06 Spot 39	125.16	5479.68	0.89	19.43	2.46	0.06	3.79	0.01	0.79	0.21	53.37	0.42	55.00	2.03	126.31	87.18	53.37	0.42	42.25
19AL06 Spot 40	220.56	20006.63	0.89	21.79	1.97	0.05	2.28	0.01	1.14	0.50	53.37	0.61	51.01	1.14	NA	NA	53.37	0.61	NA
19AL06 Spot 41	421.03	13420.71	2.08	20.99	1.36	0.05	1.64	0.01	0.91	0.55	52.91	0.48	52.10	0.83	14.92	NA	52.91	0.48	354.63
19AL06 Spot 42	151.92	13746.81	0.75	17.55	3.24	0.06	3.42	0.01	1.07	0.31	53.95	0.58	63.45	2.10	438.50	72.21	53.95	0.58	12.30
19AL06 Spot 43	308.23	25213.74	1.43	21.60	1.85	0.05	2.18	0.01	0.96	0.44	53.41	0.51	51.65	1.10	NA	NA	53.41	0.51	NA
19AL06 Spot 44	1147.16	118773.04	0.87	21.35	0.90	0.05	1.12	0.01	0.67	0.60	51.68	0.34	51.10	0.56	23.96	21.66	51.68	0.34	215.68
19AL06 Spot 45	269.16	30329.81	1.48	21.22	1.83	0.05	2.11	0.01	0.92	0.44	52.95	0.49	52.25	1.08	19.99	NA	52.95	0.49	264.86
19AL06 Spot 46	239.46	171178.42	0.65	21.51	1.77	0.05	2.00	0.01	0.92	0.46	52.60	0.48	51.65	1.00	7.81	NA	52.60	0.48	673.14
19AL06 Spot 47	282.09	6820.11	2.02	21.48	1.06	0.05	1.43	0.01	0.95	0.66	53.11	0.50	49.93	0.70	NA	NA	53.11	0.50	NA
19AL06 Spot 48	491.78	23700.98	1.57	21.09	1.41	0.05	1.65	0.01	0.84	0.51	52.18	0.44	51.68	0.83	28.53	NA	52.18	0.44	182.92
19AL06 Spot 49	291.18	9752.11	2.24	20.87	1.72	0.05	2.00	0.01	0.95	0.47	53.30	0.50	52.33	1.02	7.92	NA	53.30	0.50	673.29
19AL06 Spot 50	433.38	30319.95	1.40	20.92	1.40	0.05	1.73	0.01	1.01	0.58	53.75	0.54	53.76	0.90	54.18	33.42	53.75	0.54	99.21

Table S2 (Continued). U/Pb igneous zircon geochronologic analyses by LA-ICP-MS																				
	Isotope Ratios											Apparent Ages (Ma)								
Analysis	U	206Pb	U/Th	206Pb*	± 1σ	207Pb*	± 1σ	206Pb*	± 1σ	error	206Pb*	± 1σ	207Pb*	± 1σ	206Pb*	± 1σ	Best Age	± 1σ	% conc
	(ppm)	204Pb		207Pb*	(%)	235U	(%)	238U	(%)	corr.	238U	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	
Sample 19AL07: (Lat/Long: 29.55293, 86.3443)--NAD 1983 coordinate system																			
19AL07 Spot 51	611.94	9395.83	1.56	21.30	1.58	0.05	2.06	0.01	0.95	0.46	53.83	0.51	51.49	1.04	NA	NA	53.83	0.51	NA
19AL07 Spot 52	627.33	14938.41	1.78	14.89	4.99	0.08	5.10	0.01	1.04	0.20	54.92	0.57	75.71	3.72	794.43	104.75	54.92	0.57	6.91
19AL07 Spot 53	588.40	6900.59	2.48	21.24	1.59	0.05	2.04	0.01	1.11	0.54	54.48	0.60	51.66	1.03	NA	NA	54.48	0.60	NA
19AL07 Spot 54	423.12	8529.42	1.15	21.18	1.48	0.05	1.83	0.01	0.95	0.52	54.26	0.52	52.07	0.93	NA	NA	54.26	0.52	NA
19AL07 Spot 55	442.26	26211.95	2.87	20.10	1.59	0.06	1.88	0.01	0.95	0.51	54.93	0.52	56.88	1.04	139.62	38.04	54.93	0.52	39.34
19AL07 Spot 56	260.47	7500.88	1.12	20.69	2.00	0.05	2.27	0.01	0.99	0.43	53.60	0.53	52.44	1.16	-0.63	NA	53.60	0.53	-8506.65
19AL07 Spot 57	245.14	51726.26	2.33	19.94	2.36	0.06	2.71	0.01	1.34	0.49	54.84	0.73	57.55	1.52	171.65	55.07	54.84	0.73	31.95
19AL07 Spot 58	465.15	12104.58	0.87	21.93	2.22	0.05	2.53	0.01	1.22	0.48	55.32	0.67	51.77	1.28	NA	NA	55.32	0.67	NA
19AL07 Spot 59	252.04	13776.54	1.15	21.29	2.26	0.05	2.55	0.01	1.03	0.40	54.74	0.56	52.95	1.32	NA	NA	54.74	0.56	NA
19AL07 Spot 60	479.77	3027.51	1.22	7.15	8.27	0.17	8.57	0.01	2.15	0.25	57.53	1.23	155.98	12.39	2155.47	145.07	57.53	1.23	2.67
19AL07 Spot 61	390.08	10147.51	0.58	20.77	2.18	0.05	2.44	0.01	0.93	0.38	54.83	0.51	53.94	1.28	14.26	NA	54.83	0.51	384.48
19AL07 Spot 62	778.43	104360.97	1.79	21.20	1.37	0.05	1.66	0.01	0.94	0.56	54.08	0.51	53.51	0.87	28.21	NA	54.08	0.51	191.70
19AL07 Spot 63	602.44	23107.31	1.86	18.88	2.71	0.06	2.90	0.01	1.02	0.35	56.03	0.57	61.46	1.73	278.68	62.18	56.03	0.57	20.10
19AL07 Spot 64	357.39	11498.68	0.87	20.95	2.09	0.05	2.69	0.01	0.97	0.36	55.20	0.54	53.94	1.41	NA	NA	55.20	0.54	NA
19AL07 Spot 65	436.06	14816.01	2.47	20.40	1.98	0.05	2.33	0.01	1.22	0.52	53.61	0.65	54.15	1.23	78.42	47.20	53.61	0.65	68.36
19AL07 Spot 66	633.51	65273.23	1.80	20.96	1.34	0.05	1.76	0.01	1.13	0.64	53.84	0.61	53.76	0.92	50.29	32.10	53.84	0.61	107.07
19AL07 Spot 67	566.64	4020.67	1.45	21.20	1.25	0.05	1.60	0.01	0.98	0.61	52.38	0.51	48.09	0.75	NA	NA	52.38	0.51	NA
19AL07 Spot 68	199.89	4175.21	0.79	22.17	2.29	0.05	3.11	0.01	1.13	0.36	54.64	0.61	47.94	1.46	NA	NA	54.64	0.61	NA
19AL07 Spot 69	281.03	3139.83	1.21	20.10	2.15	0.05	3.15	0.01	1.19	0.38	55.11	0.65	52.30	1.61	NA	NA	55.11	0.65	NA
19AL07 Spot 70	478.85	5779.14	2.12	19.10	1.81	0.06	2.28	0.01	1.04	0.45	55.60	0.57	58.20	1.29	166.47	47.49	55.60	0.57	33.40
19AL07 Spot 71	388.65	8838.30	2.28	21.18	1.89	0.05	2.53	0.01	1.07	0.42	54.85	0.58	52.63	1.29	NA	NA	54.85	0.58	NA
19AL07 Spot 72	128.68	4000.29	1.05	20.12	3.07	0.05	5.23	0.01	1.29	0.25	55.88	0.72	54.10	2.75	NA	NA	55.88	0.72	NA
19AL07 Spot 73	430.63	4390.38	1.52	20.90	2.03	0.05	2.35	0.01	0.95	0.41	53.88	0.51	50.52	1.16	NA	NA	53.88	0.51	NA
19AL07 Spot 74	241.73	8481.79	0.77	20.47	2.70	0.05	2.88	0.01	0.99	0.34	53.42	0.52	52.96	1.49	32.50	NA	53.42	0.52	164.34
19AL07 Spot 75	583.09	28067.58	1.85	20.63	1.26	0.06	1.65	0.01	0.99	0.60	54.56	0.54	55.01	0.88	74.88	31.55	54.56	0.54	72.86
19AL07 Spot 76	628.27	5634.17	1.61	21.36	1.30	0.05	2.31	0.01	1.24	0.54	52.57	0.65	48.90	1.10	NA	NA	52.57	0.65	NA
19AL07 Spot 77	722.85	37172.54	1.44	19.09	1.76	0.06	2.00	0.01	0.95	0.48	55.17	0.52	60.07	1.17	260.13	40.52	55.17	0.52	21.21
19AL07 Spot 78	706.46	25972.32	1.80	20.72	1.57	0.05	1.95	0.01	1.14	0.59	54.01	0.61	54.09	1.03	57.61	37.64	54.01	0.61	93.76
19AL07 Spot 79	634.99	12835.20	1.22	18.07	1.71	0.06	2.08	0.01	1.19	0.57	53.49	0.64	60.67	1.23	354.04	38.58	53.49	0.64	15.11
19AL07 Spot 80	423.45	4729.32	1.12	21.58	1.63	0.05	1.93	0.01	0.95	0.49	54.60	0.52	49.65	0.93	NA	NA	54.60	0.52	NA
19AL07 Spot 81	356.53	3766.26	1.11	20.94	1.91	0.05	2.67	0.01	0.96	0.36	54.81	0.52	50.64	1.32	NA	NA	54.81	0.52	NA
19AL07 Spot 82	583.06	14962.33	1.92	19.55	2.02	0.06	2.50	0.01	1.46	0.59	55.48	0.81	58.46	1.42	182.09	47.12	55.48	0.81	30.47
19AL07 Spot 83	254.37	5407.46	1.02	13.92	4.50	0.08	4.60	0.01	0.95	0.21	57.22	0.54	82.19	3.63	886.30	93.13	57.22	0.54	6.46
19AL07 Spot 84	557.99	8330.99	1.60	21.55	1.36	0.05	1.86	0.01	1.21	0.65	54.57	0.66	51.32	0.93	NA	NA	54.57	0.66	NA
19AL07 Spot 85	283.29	2254.46	0.90	20.18	1.94	0.05	3.02	0.01	1.03	0.34	54.45	0.56	49.35	1.46	NA	NA	54.45	0.56	NA
19AL07 Spot 86	720.40	11594.42	0.91	21.28	1.59	0.05	2.24	0.01	1.46	0.65	55.56	0.81	53.45	1.16	NA	NA	55.56	0.81	NA
19AL07 Spot 87	455.48	8635.83	1.78	20.64	2.15	0.05	2.34	0.01	0.86	0.37	54.98	0.47	54.05	1.23	13.32	NA	54.98	0.47	412.82
19AL07 Spot 88	315.68	4022.53	1.92	21.41	2.14	0.05	2.37	0.01	0.99	0.42	53.66	0.53	48.68	1.13	NA	NA	53.66	0.53	NA
19AL07 Spot 89	473.23	6445.86	1.06	20.80	2.03	0.05	2.26	0.01	1.00	0.44	54.07	0.54	52.10	1.15	NA	NA	54.07	0.54	NA
19AL07 Spot 90	635.19	25504.60	1.94	20.69	1.18	0.06	1.77	0.01	1.23	0.69	54.45	0.67	54.68	0.94	64.77	30.43	54.45	0.67	84.06
19AL07 Spot 91	299.62	2067.01	1.90	20.99	2.01	0.05	3.15	0.01	0.75	0.24	53.98	0.40	46.14	1.42	NA	NA	53.98	0.40	NA
19AL07 Spot 92	388.79	18642.79	1.37	19.96	1.78	0.06	2.17	0.01	1.25	0.57	56.58	0.70	58.63	1.24	142.95	41.72	56.58	0.70	39.58
19AL07 Spot 93	681.64	35203.08	2.15	21.64	1.12	0.05	1.56	0.01	1.08	0.69	53.76	0.58	51.95	0.79	NA	NA	53.76	0.58	NA
19AL07 Spot 94	295.19	6750.08	1.88	21.01	2.44	0.05	3.11	0.01	0.97	0.31	55.39	0.53	53.04	1.61	NA	NA	55.39	0.53	NA
19AL07 Spot 95	496.97	13855.89	1.96	19.94	1.82	0.06	2.15	0.01	1.10	0.51	55.76	0.61	57.59	1.20	134.09	43.41	55.76	0.61	41.59
19AL07 Spot 96	727.99	13117.35	2.10	20.84	1.30	0.05	1.86	0.01	1.18	0.64	53.52	0.63	52.93	0.96	26.27	NA	53.52	0.63	203.71
19AL07 Spot 97	628.96	15220.64	2.09	20.91	1.28	0.05	1.75	0.01	1.09	0.62	54.68	0.59	54.04	0.92	25.84	NA	54.68	0.59	211.59
19AL07 Spot 98	393.29	3694.13	0.90	21.85	1.61	0.05	5.21	0.01	1.08	0.21	53.55	0.57	47.29	2.41	NA	NA	53.55	0.57	NA
19AL07 Spot 99	666.91	9466.38	1.43	21.26	1.45	0.05	2.33	0.01	1.26	0.54	53.97	0.68	51.83	1.18	NA	NA	53.97	0.68	NA
19AL07 Spot 100	240.40	6523.97	0.80	20.32	2.14	0.06	2.34	0.01	0.92	0.39	55.88	0.51	55.29	1.26	29.92	NA	55.88	0.51	186.78

Table S2 (Continued). U/Pb igneous zircon geochronologic analyses by LA-ICP-MS

Analysis	U	206Pb	U/Th	206Pb*	± 1σ	207Pb*	± 1σ	206Pb*	± 1σ	error	206Pb*	± 1σ	207Pb*	± 1σ	206Pb*	± 1σ	Best Age	± 1σ	% conc
	(ppm)	204Pb		207Pb*	(%)	235U	(%)	238U	(%)	corr.	238U	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	
Sample 19AL08: (Lat/Long: 29.55096, 86.33735)–NAD 1983 coordinate system																			
19AL08 Spot 101	151.15	3218.09	1.17	19.48	2.92	0.06	5.91	0.01	1.45	0.25	58.63	0.85	57.75	3.32	21.54	NA	58.63	0.85	272.17
19AL08 Spot 102	455.75	8864.62	2.87	20.92	2.17	0.06	2.69	0.01	1.48	0.55	56.37	0.83	54.86	1.44	NA	NA	56.37	0.83	NA
19AL08 Spot 103	1084.55	49631.32	1.17	18.93	1.54	0.07	2.20	0.01	1.57	0.71	58.81	0.92	64.87	1.38	294.30	35.15	58.81	0.92	19.98
19AL08 Spot 104	548.21	5964.42	2.30	20.27	2.31	0.05	2.96	0.01	1.80	0.61	54.37	0.97	53.76	1.55	26.88	NA	54.37	0.97	202.23
19AL08 Spot 105	274.71	2350.66	1.21	7.85	12.99	0.16	13.25	0.01	2.26	0.17	60.95	1.37	149.43	18.42	1971.54	233.82	60.95	1.37	3.09
19AL08 Spot 106	416.03	54007.18	0.94	20.77	1.35	0.06	1.74	0.01	1.10	0.63	55.10	0.61	55.61	0.94	77.71	31.96	55.10	0.61	70.90
19AL08 Spot 107	445.87	5622.95	2.13	17.34	2.44	0.08	2.76	0.01	1.17	0.43	67.17	0.78	77.13	2.05	397.64	55.95	67.17	0.78	16.89
19AL08 Spot 108	1088.72	59323.83	1.42	18.72	1.98	0.07	2.10	0.01	0.71	0.34	61.56	0.44	68.47	1.39	317.08	44.96	61.56	0.44	19.42
19AL08 Spot 109	507.41	8549.04	2.92	20.29	2.22	0.06	2.87	0.01	1.11	0.39	56.33	0.62	56.37	1.58	57.80	NA	56.33	0.62	97.46
19AL08 Spot 110	526.67	15311.01	1.54	20.39	1.38	0.06	1.93	0.01	1.32	0.69	55.93	0.74	56.58	1.06	84.18	33.21	55.93	0.74	66.44
19AL08 Spot 111	367.94	12393.19	1.97	17.28	3.43	0.08	3.91	0.01	1.55	0.40	63.70	0.98	75.38	2.84	463.33	79.52	63.70	0.98	13.75
19AL08 Spot 112	1056.10	21721.34	2.38	20.74	1.12	0.06	1.93	0.01	1.57	0.81	63.83	0.99	63.69	1.19	58.33	26.87	63.83	0.99	109.43
19AL08 Spot 113	2152.19	7424.13	1.51	13.41	3.78	0.09	4.07	0.01	1.47	0.36	55.51	0.81	83.85	3.28	991.40	77.23	55.51	0.81	5.60
19AL08 Spot 114	630.63	47622.39	1.19	21.56	1.81	0.06	2.42	0.01	1.60	0.66	56.95	0.91	55.35	1.30	NA	NA	56.95	0.91	NA
19AL08 Spot 115	594.78	204304.64	1.60	20.95	1.55	0.06	1.99	0.01	1.25	0.63	56.39	0.70	56.66	1.10	68.22	36.81	56.39	0.70	82.65
19AL08 Spot 116	877.55	9619.82	1.18	20.18	1.27	0.06	2.12	0.01	1.70	0.80	55.10	0.93	55.86	1.15	88.67	30.16	55.10	0.93	62.14
19AL08 Spot 117	1071.39	102927.48	1.35	20.70	1.31	0.06	1.78	0.01	1.20	0.68	57.03	0.68	57.93	1.00	95.32	31.05	57.03	0.68	59.83
19AL08 Spot 118	1044.10	7897.20	2.56	15.33	2.44	0.09	3.01	0.01	1.77	0.59	63.47	1.12	83.87	2.42	712.03	51.83	63.47	1.12	8.91
19AL08 Spot 119	385.67	9622.13	2.86	20.62	1.62	0.06	2.26	0.01	1.13	0.50	59.12	0.67	58.57	1.29	36.28	NA	59.12	0.67	162.97
19AL08 Spot 121	754.48	30749.28	1.46	20.07	1.12	0.06	1.81	0.01	1.36	0.76	56.22	0.76	58.48	1.03	152.27	27.74	56.22	0.76	36.92
19AL08 Spot 122	399.57	11283.05	0.99	20.89	1.69	0.06	2.48	0.01	1.15	0.46	57.59	0.66	56.58	1.37	14.33	NA	57.59	0.66	401.96
19AL08 Spot 123	2034.84	14188.72	3.91	19.92	1.04	0.06	1.51	0.01	1.09	0.72	58.27	0.63	60.32	0.88	142.68	24.43	58.27	0.63	40.84
19AL08 Spot 124	1172.80	2902.30	1.11	9.83	1.49	0.14	1.68	0.01	0.77	0.46	67.98	0.52	133.94	2.10	1556.79	27.92	67.98	0.52	4.37
19AL08 Spot 125	209.25	1884.93	1.38	19.07	2.84	0.06	3.15	0.01	1.23	0.39	57.85	0.71	54.49	1.67	NA	NA	57.85	0.71	NA
19AL08 Spot 126	144.00	10830.12	0.77	10.96	10.91	0.11	11.02	0.01	1.55	0.14	59.02	0.91	109.29	11.42	1417.07	209.16	59.02	0.91	4.17
19AL08 Spot 127	504.62	174314.64	1.14	17.20	1.75	0.07	2.07	0.01	1.09	0.53	56.06	0.61	68.39	1.37	524.18	38.47	56.06	0.61	10.70
19AL08 Spot 128	908.49	9300.40	1.48	21.25	1.24	0.06	1.82	0.01	1.26	0.69	57.29	0.72	55.09	0.98	NA	NA	57.29	0.72	NA
19AL08 Spot 129	641.11	4524.33	1.94	14.59	3.48	0.08	3.79	0.01	1.19	0.31	58.38	0.69	79.72	2.91	777.91	75.72	58.38	0.69	7.50
19AL08 Spot 130	699.74	6405.46	1.80	16.26	1.91	0.08	2.46	0.01	0.93	0.38	64.61	0.60	79.99	1.89	567.79	49.61	64.61	0.60	11.38
19AL08 Spot 131	534.03	24258.61	2.02	19.20	1.67	0.06	2.26	0.01	1.52	0.67	55.14	0.84	59.95	1.32	256.63	38.46	55.14	0.84	21.49
19AL08 Spot 132	232.93	3045.74	1.01	20.45	2.25	0.05	2.95	0.01	1.55	0.53	53.79	0.83	50.25	1.44	NA	NA	53.79	0.83	NA
19AL08 Spot 133	210.84	9107.73	1.83	22.55	2.62	0.05	3.08	0.01	1.31	0.43	56.40	0.74	51.11	1.54	NA	NA	56.40	0.74	NA
19AL08 Spot 134	387.30	16648.02	2.02	20.63	2.24	0.06	2.62	0.01	1.35	0.52	55.56	0.75	55.94	1.42	71.98	53.27	55.56	0.75	77.19
19AL08 Spot 135	536.20	26461.02	2.59	20.97	1.62	0.06	1.97	0.01	1.12	0.57	55.68	0.62	55.53	1.07	49.17	38.91	55.68	0.62	113.22
19AL08 Spot 136	549.10	30140.00	1.12	21.12	1.67	0.06	2.21	0.01	1.45	0.66	55.00	0.79	54.49	1.17	32.02	NA	55.00	0.79	171.79
19AL08 Spot 137	3817.00	57074.83	0.47	21.13	1.00	0.05	1.58	0.01	1.23	0.78	52.41	0.64	52.20	0.81	42.90	23.85	52.41	0.64	122.16
19AL08 Spot 138	1885.90	32968.86	0.51	21.03	0.90	0.06	1.40	0.01	1.07	0.76	56.21	0.60	55.96	0.76	44.94	21.55	56.21	0.60	125.09
19AL08 Spot 139	354.67	4466.53	1.09	21.27	2.40	0.05	2.94	0.01	1.59	0.54	55.37	0.88	51.23	1.47	NA	NA	55.37	0.88	NA
19AL08 Spot 140	382.55	2509.58	0.58	10.62	4.00	0.11	4.12	0.01	1.00	0.24	58.92	0.59	107.52	4.21	1387.43	76.83	58.92	0.59	4.25
19AL08 Spot 141	821.95	17524.72	1.43	19.91	1.63	0.06	1.94	0.01	1.02	0.52	57.92	0.59	60.42	1.14	160.76	38.69	57.92	0.59	36.03
19AL08 Spot 142	1213.59	115592.94	0.98	20.63	0.96	0.07	1.36	0.01	0.96	0.71	67.26	0.64	68.44	0.90	110.05	22.62	67.26	0.64	61.12
19AL08 Spot 143	663.73	7364.04	1.77	14.58	3.40	0.08	4.10	0.01	1.75	0.43	58.50	1.02	81.45	3.21	820.53	77.48	58.50	1.02	7.13
19AL08 Spot 144	3914.50	44324.57	1.68	20.52	1.09	0.06	1.26	0.01	0.64	0.50	57.99	0.37	59.31	0.73	113.19	25.78	57.99	0.37	51.23
19AL08 Spot 145	532.01	11814.34	2.06	16.52	3.90	0.07	4.21	0.01	1.58	0.37	57.89	0.91	72.10	2.93	573.15	84.91	57.89	0.91	10.10
19AL08 Spot 146	461.35	27630.75	2.16	20.12	2.03	0.06	2.43	0.01	1.31	0.54	56.26	0.73	58.39	1.38	146.69	48.08	56.26	0.73	38.36
19AL08 Spot 147	518.15	23290.31	2.36	20.66	1.71	0.06	2.18	0.01	1.35	0.62	57.01	0.77	57.53	1.22	78.99	40.72	57.01	0.77	72.17
19AL08 Spot 148	271.75	10602.19	0.97	21.45	1.73	0.05	2.52	0.01	1.74	0.69	54.56	0.94	52.24	1.28	NA	NA	54.56	0.94	NA
19AL08 Spot 149	672.19	10618.67	1.73	20.85	1.54	0.06	2.26	0.01	1.61	0.71	55.33	0.88	54.49	1.20	18.04	NA	55.33	0.88	306.67
19AL08 Spot 150	501.68	7639.65	2.94	21.00	1.86	0.05	2.28	0.01	1.30	0.57	55.90	0.72	54.08	1.20	NA	NA	55.90	0.72	NA

Table S2 (Continued). U/Pb igneous zircon geochronologic analyses by LA-ICP-MS

Analysis	Isotope Ratios										Apparent Ages (Ma)								
	U (ppm)	206Pb 204Pb	U/Th	206Pb* 207Pb*	± 1σ (%)	207Pb* 235U	± 1σ (%)	206Pb* 238U	± 1σ (%)	error corr.	206Pb* 238U	± 1σ (Ma)	207Pb* 235U	± 1σ (Ma)	206Pb* 207Pb*	± 1σ (Ma)	**Best Age (Ma)**	**± 1σ (Ma)**	% conc
Sample 19AR04: (Lat/Long: 29.410081, 87.165103)--NAD 1983 coordinate system																			
19AR04 Spot 1	461.28	6512.79	0.68	20.72	1.67	0.05	2.48	0.01	0.98	0.40	50.98	0.50	49.33	1.20	NA	NA	50.98	0.50	NA
19AR04 Spot 2	606.03	18262.47	0.50	20.93	1.27	0.05	1.75	0.01	1.18	0.67	50.24	0.59	49.64	0.85	20.79	NA	50.24	0.59	241.71
19AR04 Spot 3	662.12	50902.31	0.54	19.63	1.69	0.05	1.98	0.01	1.02	0.52	50.47	0.51	53.66	1.03	198.72	39.36	50.47	0.51	25.40
19AR04 Spot 4	178.83	8131.03	1.05	21.35	2.74	0.05	3.03	0.01	1.20	0.40	51.01	0.61	48.34	1.43	NA	NA	51.01	0.61	NA
19AR04 Spot 5	307.36	2899.70	0.91	19.62	2.39	0.05	2.62	0.01	0.89	0.34	50.58	0.45	48.83	1.25	NA	NA	50.58	0.45	NA
19AR04 Spot 6	226.99	4936.24	1.23	21.09	2.47	0.05	3.62	0.01	0.97	0.27	50.57	0.49	47.34	1.67	NA	NA	50.57	0.49	NA
19AR04 Spot 7	436.38	8936.27	0.96	20.14	2.16	0.05	2.47	0.01	0.95	0.38	49.98	0.47	50.49	1.22	74.55	54.19	49.98	0.47	67.04
19AR04 Spot 8	437.74	44691.13	0.97	20.88	2.08	0.05	2.26	0.01	0.87	0.38	51.82	0.45	51.86	1.14	53.59	49.74	51.82	0.45	96.69
19AR04 Spot 9	221.97	5237.28	0.75	20.33	2.97	0.05	3.15	0.01	0.98	0.31	50.63	0.49	49.44	1.52	NA	NA	50.63	0.49	NA
19AR04 Spot 10	304.39	107016.12	0.71	21.38	2.24	0.05	2.47	0.01	1.05	0.42	51.80	0.54	50.84	1.22	6.05	NA	51.80	0.54	855.50
19AR04 Spot 11	691.05	14851.54	0.56	20.82	1.45	0.05	1.78	0.01	0.97	0.54	50.93	0.49	50.44	0.88	26.87	NA	50.93	0.49	189.57
19AR04 Spot 12	237.85	2691.07	0.72	21.49	2.90	0.04	3.43	0.01	0.93	0.27	50.24	0.46	43.51	1.46	NA	NA	50.24	0.46	NA
19AR04 Spot 13	426.48	75497.36	0.89	21.14	1.81	0.05	2.05	0.01	0.95	0.46	50.74	0.48	50.31	1.00	30.11	NA	50.74	0.48	168.53
19AR04 Spot 14	423.53	6768.75	0.67	21.66	2.11	0.05	2.42	0.01	1.10	0.45	51.27	0.56	47.53	1.13	NA	NA	51.27	0.56	NA
19AR04 Spot 15	357.75	12082.57	0.89	21.21	1.94	0.05	2.16	0.01	0.74	0.34	51.00	0.38	49.32	1.04	NA	NA	51.00	0.38	NA
19AR04 Spot 16	369.71	21609.33	0.92	21.59	2.01	0.05	2.21	0.01	0.92	0.42	50.57	0.46	48.64	1.05	NA	NA	50.57	0.46	NA
19AR04 Spot 17	268.05	8042.70	1.02	19.99	2.58	0.05	2.79	0.01	0.99	0.35	51.39	0.51	52.13	1.42	86.61	61.77	51.39	0.51	59.33
19AR04 Spot 18	351.26	14834.05	0.91	20.40	2.02	0.05	2.26	0.01	1.01	0.45	51.67	0.52	52.22	1.15	77.47	48.11	51.67	0.52	66.70
19AR04 Spot 19	426.22	4352.58	1.09	11.43	6.06	0.10	6.22	0.01	1.21	0.20	53.31	0.64	92.66	5.50	1280.03	118.90	53.31	0.64	4.16
19AR04 Spot 20	330.20	7867.78	1.15	20.83	2.27	0.05	2.69	0.01	0.97	0.36	50.37	0.49	48.99	1.29	NA	NA	50.37	0.49	NA
19AR04 Spot 21	322.48	6808.01	0.76	21.37	1.99	0.05	2.26	0.01	0.91	0.40	51.88	0.47	48.84	1.08	NA	NA	51.88	0.47	NA
19AR04 Spot 22	2525.41	8083.80	0.59	13.13	6.87	0.08	7.08	0.01	1.22	0.17	51.46	0.62	79.54	5.42	1034.19	141.12	51.46	0.62	4.98
19AR04 Spot 23	875.91	21595.09	0.47	21.78	1.41	0.05	1.73	0.01	0.99	0.57	51.70	0.51	49.34	0.83	NA	NA	51.70	0.51	NA
19AR04 Spot 25	372.09	16237.13	0.83	19.39	2.22	0.05	2.39	0.01	0.88	0.37	50.78	0.44	54.16	1.26	206.09	51.57	50.78	0.44	24.64
19AR04 Spot 26	127.06	11181.47	1.03	22.24	3.29	0.05	3.48	0.01	1.12	0.32	51.44	0.57	47.40	1.61	NA	NA	51.44	0.57	NA
19AR04 Spot 27	389.44	7973.50	0.94	20.98	1.67	0.05	2.12	0.01	1.07	0.50	50.00	0.53	48.33	1.00	NA	NA	50.00	0.53	NA
19AR04 Spot 28	363.52	12332.43	1.21	18.23	2.95	0.06	3.15	0.01	0.96	0.30	53.56	0.51	60.31	1.84	337.17	67.90	53.56	0.51	15.88
19AR04 Spot 29	204.30	3951.25	1.07	20.79	2.60	0.05	3.04	0.01	1.04	0.34	51.76	0.54	48.44	1.44	NA	NA	51.76	0.54	NA
19AR04 Spot 30	174.71	6923.56	1.30	21.40	3.13	0.05	4.16	0.01	1.29	0.31	50.32	0.65	47.40	1.92	NA	NA	50.32	0.65	NA
19AR04 Spot 31	336.87	4296.89	0.83	20.75	1.68	0.05	3.07	0.01	0.97	0.32	51.06	0.49	48.20	1.44	NA	NA	51.06	0.49	NA
19AR04 Spot 33	195.34	2355.48	1.44	18.88	3.16	0.05	5.67	0.01	1.40	0.25	52.05	0.72	51.26	2.83	14.60	NA	52.05	0.72	356.57
19AR04 Spot 34	234.71	11222.95	0.78	21.40	2.90	0.05	3.10	0.01	1.04	0.34	51.20	0.53	49.10	1.49	NA	NA	51.20	0.53	NA
19AR04 Spot 35	540.26	5293.89	1.21	19.81	1.48	0.05	1.82	0.01	1.06	0.58	51.24	0.54	51.53	0.92	65.03	35.40	51.24	0.54	78.79
19AR04 Spot 36	475.11	14476.31	0.81	21.27	1.74	0.05	2.06	0.01	0.98	0.48	51.21	0.50	49.65	1.00	NA	NA	51.21	0.50	NA
19AR04 Spot 37	440.57	2775.03	0.77	20.41	2.17	0.05	2.36	0.01	0.70	0.30	50.15	0.35	46.22	1.07	NA	NA	50.15	0.35	NA
19AR04 Spot 38	191.84	3620.44	0.89	21.64	2.65	0.04	2.89	0.01	1.03	0.36	49.72	0.51	44.25	1.25	NA	NA	49.72	0.51	NA
19AR04 Spot 39	410.24	20069.37	0.67	21.05	1.97	0.05	2.17	0.01	0.88	0.41	51.03	0.45	50.29	1.06	14.98	NA	51.03	0.45	340.70
19AR04 Spot 40	341.93	3961.75	1.00	20.71	2.43	0.05	3.55	0.01	0.87	0.25	49.89	0.43	46.90	1.63	NA	NA	49.89	0.43	NA
19AR04 Spot 41	215.93	2497.14	1.13	21.81	2.58	0.04	8.00	0.01	0.90	0.11	50.67	0.45	42.71	3.34	NA	NA	50.67	0.45	NA
19AR04 Spot 42	298.76	9875.23	0.76	21.65	2.70	0.05	3.34	0.01	1.03	0.31	49.63	0.51	46.83	1.53	NA	NA	49.63	0.51	NA
19AR04 Spot 43	344.87	15967.21	0.98	20.45	1.96	0.05	2.35	0.01	1.08	0.46	50.91	0.55	51.44	1.18	76.21	49.71	50.91	0.55	66.80
19AR04 Spot 44	297.49	6936.36	0.81	20.56	2.10	0.05	2.66	0.01	1.09	0.41	51.15	0.55	50.15	1.30	2.67	NA	51.15	0.55	1912.93
19AR04 Spot 45	307.92	3307.57	1.20	19.06	3.63	0.05	3.82	0.01	0.72	0.19	51.58	0.37	52.15	1.94	78.75	NA	51.58	0.37	65.49
19AR04 Spot 46	183.65	2956.49	1.36	20.96	2.83	0.05	3.16	0.01	1.07	0.34	49.69	0.53	44.84	1.38	NA	NA	49.69	0.53	NA
19AR04 Spot 47	414.96	4684.45	0.80	20.67	1.91	0.05	2.75	0.01	0.94	0.34	50.88	0.48	48.52	1.30	NA	NA	50.88	0.48	NA
19AR04 Spot 49	500.93	21545.10	0.59	20.62	1.62	0.05	1.90	0.01	0.99	0.52	49.80	0.49	50.18	0.93	68.19	38.73	49.80	0.49	73.04
19AR04 Spot 50	435.14	14813.36	0.58	19.14	2.18	0.06	2.42	0.01	1.02	0.42	50.91	0.52	54.87	1.29	231.30	50.68	50.91	0.52	22.01

Table S2 (Continued). U/Pb igneous zircon geochronologic analyses by LA-ICP-MS

Analysis	Isotope Ratios										Apparent Ages (Ma)								
	U (ppm)	206Pb 204Pb	U/Th	206Pb* 207Pb*	± 1σ (%)	207Pb* 235U	± 1σ (%)	206Pb* 238U	± 1σ (%)	error corr.	206Pb* 238U	± 1σ (Ma)	207Pb* 235U	± 1σ (Ma)	206Pb* 207Pb*	± 1σ (Ma)	**Best Age (Ma)**	**± 1σ (Ma)**	% conc
Sample 19AR07: (Lat/Long: 29.4663, 87.1517)--NAD 1983 coordinate system																			
19AR07 Spot 53	139.64	6008.27	1.02	20.22	2.78	0.05	3.33	0.01	1.04	0.31	50.92	0.53	50.57	1.64	33.77	NA	50.92	0.53	150.82
19AR07 Spot 54	169.52	9972.62	0.72	18.82	2.31	0.06	2.55	0.01	1.02	0.40	50.09	0.51	54.58	1.35	256.34	53.65	50.09	0.51	19.54
19AR07 Spot 55	108.76	3930.73	0.60	15.92	5.43	0.07	5.59	0.01	0.74	0.13	52.16	0.38	64.70	3.50	557.45	120.93	52.16	0.38	9.36
19AR07 Spot 56	116.38	3245.45	1.11	20.47	3.14	0.05	3.40	0.01	1.22	0.36	48.81	0.59	45.78	1.52	NA	NA	48.81	0.59	NA
19AR07 Spot 57	109.68	4069.61	0.79	20.78	2.94	0.05	3.58	0.01	1.04	0.29	51.24	0.53	48.22	1.69	NA	NA	51.24	0.53	NA
19AR07 Spot 58	159.92	11651.78	1.83	19.87	2.74	0.05	3.13	0.01	1.48	0.47	50.57	0.74	52.33	1.60	133.86	64.91	50.57	0.74	37.78
19AR07 Spot 59	759.56	40265.65	0.35	20.87	1.14	0.05	1.36	0.01	0.73	0.54	49.76	0.36	49.99	0.66	60.74	27.26	49.76	0.36	81.93
19AR07 Spot 61	457.99	138819.07	0.91	21.06	1.31	0.05	1.66	0.01	1.02	0.62	50.45	0.51	50.48	0.82	52.16	31.13	50.45	0.51	96.71
19AR07 Spot 62	179.35	23521.49	1.10	20.81	1.88	0.05	2.37	0.01	1.28	0.54	49.17	0.63	49.27	1.14	54.15	47.66	49.17	0.63	90.81
19AR07 Spot 63	109.33	38662.29	1.10	21.10	3.29	0.05	3.52	0.01	1.25	0.36	51.87	0.65	51.47	1.77	32.81	NA	51.87	0.65	158.07
19AR07 Spot 65	159.06	38160.11	0.64	20.50	2.29	0.05	2.49	0.01	0.98	0.39	51.34	0.50	52.43	1.27	102.74	54.22	51.34	0.50	49.97
19AR07 Spot 66	123.52	4734.26	1.20	20.74	2.45	0.05	2.88	0.01	1.29	0.45	50.06	0.64	47.68	1.34	NA	NA	50.06	0.64	NA
19AR07 Spot 67	187.81	36811.90	1.07	20.25	2.29	0.05	2.49	0.01	0.96	0.39	50.70	0.49	52.37	1.27	129.35	53.97	50.70	0.49	39.20
19AR07 Spot 68	187.50	45123.66	0.62	15.29	4.73	0.07	5.45	0.01	2.71	0.50	52.24	1.41	71.05	3.74	761.51	99.73	52.24	1.41	6.86
19AR07 Spot 69	171.63	4940.33	0.84	21.28	2.47	0.05	2.69	0.01	0.94	0.35	50.40	0.47	46.89	1.23	NA	NA	50.40	0.47	NA
19AR07 Spot 70	290.49	18939.33	0.47	20.50	1.76	0.05	2.02	0.01	0.99	0.49	49.48	0.49	50.13	0.99	81.33	41.71	49.48	0.49	60.84
19AR07 Spot 71	227.55	15400.89	0.95	22.11	1.74	0.05	2.03	0.01	0.99	0.49	50.81	0.50	47.54	0.94	NA	NA	50.81	0.50	NA
19AR07 Spot 72	127.85	14058.55	1.01	20.54	2.40	0.05	2.82	0.01	1.19	0.42	49.93	0.59	50.25	1.38	65.34	60.91	49.93	0.59	76.43
19AR07 Spot 73	172.49	3926.61	1.10	21.24	1.79	0.05	2.75	0.01	0.89	0.33	50.32	0.45	46.12	1.24	NA	NA	50.32	0.45	NA
19AR07 Spot 74	161.07	3869.62	1.00	21.49	2.50	0.05	2.71	0.01	0.85	0.31	51.34	0.43	46.40	1.23	NA	NA	51.34	0.43	NA
19AR07 Spot 75	164.77	6973.35	1.42	21.09	2.29	0.05	2.60	0.01	1.15	0.44	51.16	0.58	48.98	1.24	NA	NA	51.16	0.58	NA
19AR07 Spot 76	81.71	6696.84	1.13	20.74	3.68	0.05	4.00	0.01	1.41	0.35	49.78	0.70	48.46	1.89	NA	NA	49.78	0.70	NA
19AR07 Spot 77	126.41	20356.90	1.03	19.91	2.46	0.05	2.71	0.01	1.12	0.41	49.26	0.55	51.53	1.36	158.36	57.78	49.26	0.55	31.10
19AR07 Spot 78	128.53	7928.14	1.14	16.90	3.63	0.06	3.87	0.01	1.15	0.30	50.52	0.58	60.90	2.29	490.86	81.54	50.52	0.58	10.29
19AR07 Spot 79	668.46	13310.44	0.64	20.77	1.58	0.05	1.85	0.01	0.94	0.51	49.53	0.47	49.28	0.89	36.86	37.96	49.53	0.47	134.40
19AR07 Spot 80	142.11	8381.69	1.03	20.55	2.27	0.05	2.77	0.01	0.92	0.33	49.79	0.46	49.39	1.33	30.00	NA	49.79	0.46	165.97
19AR07 Spot 81	257.77	14819.41	0.84	21.65	1.69	0.05	2.06	0.01	1.17	0.57	49.92	0.58	47.76	0.96	NA	NA	49.92	0.58	NA
19AR07 Spot 82	396.61	9093.12	1.78	21.22	1.58	0.05	2.07	0.01	1.26	0.61	49.46	0.62	47.64	0.96	NA	NA	49.46	0.62	NA
19AR07 Spot 83	165.67	9065.72	1.03	21.11	2.32	0.05	2.89	0.01	1.06	0.37	49.21	0.52	47.65	1.34	NA	NA	49.21	0.52	NA
19AR07 Spot 84	177.93	551626.81	0.76	22.16	2.19	0.05	2.46	0.01	1.13	0.46	50.61	0.57	48.31	1.16	NA	NA	50.61	0.57	NA
19AR07 Spot 85	177.08	5201.75	0.68	21.33	2.48	0.05	3.09	0.01	1.04	0.34	49.71	0.51	46.40	1.40	NA	NA	49.71	0.51	NA
19AR07 Spot 86	104.95	3299.46	0.98	21.08	2.92	0.05	3.18	0.01	1.17	0.37	49.56	0.58	45.08	1.40	NA	NA	49.56	0.58	NA
19AR07 Spot 87	134.29	259900.40	0.98	19.98	3.20	0.05	3.36	0.01	1.03	0.31	49.85	0.51	52.58	1.72	178.63	74.58	49.85	0.51	27.91
19AR07 Spot 88	132.84	13076.96	0.77	21.70	2.74	0.05	2.86	0.01	0.79	0.28	49.23	0.39	46.82	1.31	NA	NA	49.23	0.39	NA
19AR07 Spot 89	115.90	30902.67	0.99	19.58	3.02	0.05	3.25	0.01	1.19	0.37	50.85	0.60	54.25	1.72	206.79	70.09	50.85	0.60	24.59
19AR07 Spot 90	88.06	58582.24	0.85	20.19	3.05	0.05	3.24	0.01	1.11	0.34	49.57	0.55	51.57	1.63	145.40	71.44	49.57	0.55	34.09
19AR07 Spot 91	194.08	9080.62	0.66	21.14	1.57	0.05	1.93	0.01	0.98	0.51	48.43	0.47	46.84	0.88	NA	NA	48.43	0.47	NA
19AR07 Spot 92	571.37	82720.14	0.72	20.74	1.52	0.05	2.01	0.01	1.31	0.65	50.45	0.66	51.19	1.00	86.15	36.11	50.45	0.66	58.56
19AR07 Spot 93	416.78	6884.82	0.61	21.20	1.60	0.05	1.90	0.01	1.01	0.53	48.43	0.49	46.16	0.86	NA	NA	48.43	0.49	NA
19AR07 Spot 94	107.35	25718.61	0.90	20.09	3.02	0.05	3.21	0.01	1.09	0.34	50.12	0.54	52.08	1.63	143.14	70.85	50.12	0.54	35.02
19AR07 Spot 96	129.74	5823.06	1.06	21.84	2.13	0.05	2.55	0.01	1.11	0.44	48.99	0.54	44.90	1.12	NA	NA	48.99	0.54	NA
19AR07 Spot 97	151.90	3647.60	0.61	21.39	2.23	0.04	2.73	0.01	0.95	0.35	48.85	0.46	44.20	1.18	NA	NA	48.85	0.46	NA
19AR07 Spot 98	120.30	4186.72	1.06	21.11	2.25	0.05	3.15	0.01	1.07	0.34	51.60	0.55	47.86	1.47	NA	NA	51.60	0.55	NA
19AR07 Spot 99	126.71	37850.69	0.78	21.32	2.72	0.05	2.88	0.01	0.94	0.33	49.51	0.46	48.72	1.37	9.88	NA	49.51	0.46	501.14
19AR07 Spot 100	108.42	5858.75	0.95	20.33	2.87	0.05	3.12	0.01	1.08	0.34	49.47	0.53	48.84	1.49	17.80	NA	49.47	0.53	277.90

Table S2 (Continued). U/Pb igneous zircon geochronologic analyses by LA-ICP-MS

Analysis	Isotope Ratios										Apparent Ages (Ma)								
	U	206Pb	U/Th	206Pb*	± 1σ	207Pb*	± 1σ	206Pb*	± 1σ	error	206Pb*	± 1σ	207Pb*	± 1σ	206Pb*	± 1σ	**Best Age**	**± 1σ**	% conc
	(ppm)	204Pb		207Pb*	(%)	235U	(%)	238U	(%)	corr.	238U	(Ma)	235U	(Ma)	207Pb*	(Ma)	**(Ma)**	**(Ma)**	
Sample 19AR08: (Lat/Long: 29.50104, 87.15913)--NAD 1983 coordinate system																			
19AR08 Spot 102	93.46	5766.51	1.15	17.36	3.16	0.06	3.64	0.01	1.40	0.38	53.10	0.74	61.55	2.17	403.86	75.26	53.10	0.74	13.15
19AR08 Spot 103	99.80	3063.71	1.38	20.21	3.42	0.05	6.59	0.01	1.46	0.22	50.49	0.74	47.76	3.07	NA	NA	50.49	0.74	NA
19AR08 Spot 104	251.81	17334.49	0.70	20.94	1.62	0.05	2.22	0.01	1.52	0.68	50.87	0.77	50.48	1.10	32.20	NA	50.87	0.77	157.99
19AR08 Spot 105	260.78	10128.17	0.57	13.73	4.34	0.08	4.55	0.01	1.31	0.29	52.35	0.68	78.03	3.42	958.84	89.10	52.35	0.68	5.46
19AR08 Spot 106	91.97	4779.56	0.83	23.41	2.99	0.04	4.66	0.01	1.56	0.34	50.57	0.79	42.54	1.94	NA	NA	50.57	0.79	NA
19AR08 Spot 107	179.14	8617.97	0.93	20.56	2.30	0.05	2.94	0.01	1.71	0.58	50.06	0.85	49.72	1.43	33.44	NA	50.06	0.85	149.69
19AR08 Spot 108	221.06	14130.68	0.98	10.01	11.48	0.11	11.76	0.01	2.59	0.22	53.47	1.38	108.80	12.14	1595.72	214.96	53.47	1.38	3.35
19AR08 Spot 109	161.05	21759.67	0.91	18.58	2.51	0.06	3.17	0.01	1.94	0.61	49.48	0.96	55.51	1.71	324.26	56.94	49.48	0.96	15.26
19AR08 Spot 110	159.04	44395.28	1.32	21.69	2.46	0.05	2.81	0.01	1.37	0.49	49.84	0.68	48.33	1.33	NA	NA	49.84	0.68	NA
19AR08 Spot 111	139.52	3934.26	1.13	18.87	2.23	0.05	2.69	0.01	1.37	0.51	52.00	0.71	54.12	1.42	149.19	54.31	52.00	0.71	34.85
19AR08 Spot 112	116.96	4865.71	1.13	20.54	2.72	0.05	3.24	0.01	1.44	0.44	50.51	0.72	48.86	1.55	NA	NA	50.51	0.72	NA
19AR08 Spot 114	129.34	4831.33	1.29	21.43	2.72	0.05	3.79	0.01	1.20	0.32	48.43	0.58	44.83	1.66	NA	NA	48.43	0.58	NA
19AR08 Spot 115	157.15	2454233.20	1.50	19.82	1.94	0.06	2.20	0.01	1.05	0.48	51.93	0.54	55.36	1.19	206.53	44.94	51.93	0.54	25.14
19AR08 Spot 117	176.35	7880.73	0.72	20.34	2.22	0.05	2.48	0.01	1.08	0.44	50.69	0.55	50.76	1.23	54.19	53.38	50.69	0.55	93.53
19AR08 Spot 118	158.27	3794.39	1.23	18.80	2.83	0.05	5.14	0.01	1.69	0.33	49.24	0.83	51.37	2.58	152.09	113.78	49.24	0.83	32.38
19AR08 Spot 119	214.22	7644.77	0.74	20.91	1.96	0.05	2.55	0.01	1.39	0.54	53.63	0.74	52.07	1.29	NA	NA	53.63	0.74	NA
19AR08 Spot 120	172.55	12878.72	1.22	21.20	1.95	0.05	2.67	0.01	1.79	0.67	50.43	0.90	49.16	1.28	NA	NA	50.43	0.90	NA
19AR08 Spot 121	177.98	6923.90	1.05	18.83	3.05	0.06	3.80	0.01	1.51	0.40	51.73	0.78	55.67	2.06	228.69	80.62	51.73	0.78	22.62
19AR08 Spot 122	112.09	10608.94	1.18	21.44	3.35	0.05	3.73	0.01	1.29	0.35	50.75	0.65	48.66	1.77	NA	NA	50.75	0.65	NA
19AR08 Spot 123	177.21	41956.74	0.83	21.13	2.08	0.05	2.47	0.01	1.34	0.54	50.10	0.67	49.83	1.20	36.61	NA	50.10	0.67	136.85
19AR08 Spot 124	121.36	3965.53	0.90	19.90	2.48	0.05	4.96	0.01	1.52	0.31	49.06	0.74	48.37	2.34	14.25	NA	49.06	0.74	344.33
19AR08 Spot 125	482.33	2215287.61	0.44	20.52	1.64	0.05	2.10	0.01	1.31	0.62	48.97	0.64	50.50	1.03	123.60	38.64	48.97	0.64	39.62
19AR08 Spot 126	151.76	3691.72	0.67	18.43	3.09	0.05	3.38	0.01	1.31	0.39	48.30	0.63	51.31	1.69	194.24	72.41	48.30	0.63	24.87
19AR08 Spot 127	111.58	3895.85	1.30	19.57	2.68	0.05	4.05	0.01	1.52	0.38	49.91	0.76	49.94	1.97	51.68	NA	49.91	0.76	96.57
19AR08 Spot 128	105.05	6418.75	0.99	20.10	2.81	0.05	3.36	0.01	1.73	0.52	49.15	0.85	49.32	1.62	57.79	NA	49.15	0.85	85.05
19AR08 Spot 129	57.63	7149.32	0.79	17.00	4.12	0.06	4.50	0.01	1.75	0.39	53.51	0.93	63.83	2.78	470.21	91.78	53.51	0.93	11.38
19AR08 Spot 130	129.32	6873.31	1.26	20.47	1.84	0.05	3.25	0.01	1.36	0.42	48.68	0.66	48.12	1.53	19.90	NA	48.68	0.66	244.69
19AR08 Spot 131	176.65	20138.66	0.70	21.38	2.41	0.05	2.87	0.01	1.54	0.54	50.26	0.77	48.96	1.37	NA	NA	50.26	0.77	NA
19AR08 Spot 132	80.00	3166.93	1.41	21.57	3.66	0.05	3.96	0.01	1.43	0.36	50.88	0.72	44.96	1.74	NA	NA	50.88	0.72	NA
19AR08 Spot 133	97.06	3469.71	0.76	16.68	3.64	0.06	3.88	0.01	1.31	0.34	49.09	0.64	57.66	2.18	429.84	81.49	49.09	0.64	11.42
19AR08 Spot 134	100.87	12870.17	0.83	20.75	2.63	0.05	2.90	0.01	1.23	0.42	50.56	0.62	50.32	1.43	38.71	NA	50.56	0.62	130.62
19AR08 Spot 136	131.01	17235.72	0.64	20.37	2.60	0.05	2.98	0.01	1.43	0.48	47.94	0.68	48.93	1.42	97.37	61.74	47.94	0.68	49.24
19AR08 Spot 137	109.78	4041.88	1.19	19.42	3.26	0.05	5.06	0.01	1.64	0.32	50.62	0.83	51.20	2.53	78.17	NA	50.62	0.83	64.76
19AR08 Spot 138	168.90	5743.03	1.06	20.93	2.34	0.05	2.76	0.01	1.40	0.51	52.21	0.73	49.92	1.34	NA	NA	52.21	0.73	NA
19AR08 Spot 140	368.11	32211.42	0.40	20.89	1.73	0.05	2.14	0.01	1.22	0.57	50.59	0.61	50.73	1.06	57.18	41.93	50.59	0.61	88.48
19AR08 Spot 141	264.48	37589.91	0.58	21.12	1.77	0.05	2.09	0.01	1.10	0.53	49.82	0.55	49.54	1.01	36.09	NA	49.82	0.55	138.06
19AR08 Spot 142	151.83	3010.68	0.87	21.86	2.34	0.04	2.70	0.01	1.33	0.49	49.61	0.66	43.01	1.14	NA	NA	49.61	0.66	NA
19AR08 Spot 143	117.83	4572.09	0.81	16.98	4.82	0.06	5.22	0.01	1.29	0.25	51.40	0.66	60.30	3.06	429.99	112.75	51.40	0.66	11.95
19AR08 Spot 145	91.94	5334.76	0.92	19.29	2.71	0.05	3.07	0.01	1.42	0.46	51.00	0.72	52.90	1.58	139.98	63.95	51.00	0.72	36.43
19AR08 Spot 146	121.64	14459.48	1.19	22.18	2.68	0.05	2.99	0.01	1.29	0.43	50.04	0.64	46.78	1.37	NA	NA	50.04	0.64	NA
19AR08 Spot 147	273.79	47028.67	7.14	21.43	2.10	0.05	2.55	0.01	1.45	0.57	48.08	0.70	47.25	1.18	5.67	NA	48.08	0.70	848.60
19AR08 Spot 148	145.36	3931.92	1.20	21.32	2.23	0.05	2.97	0.01	1.18	0.40	49.81	0.58	45.60	1.32	NA	NA	49.81	0.58	NA
19AR08 Spot 149	310.37	18813.28	0.90	20.79	2.01	0.05	2.34	0.01	1.18	0.50	50.65	0.59	50.75	1.16	55.10	48.35	50.65	0.59	91.93
19AR08 Spot 150	126.13	6897.10	1.04	19.32	3.25	0.05	3.43	0.01	1.03	0.30	51.04	0.52	53.50	1.79	164.96	76.39	51.04	0.52	30.94

Table S2 (Continued). U/Pb igneous zircon geochronologic analyses by LA-ICP-MS

Analysis	Isotope Ratios										Apparent Ages (Ma)								
	U (ppm)	206Pb 204Pb	U/Th	206Pb* 207Pb*	± 1σ (%)	207Pb* 235U	± 1σ (%)	206Pb* 238U	± 1σ (%)	error corr.	206Pb* 238U	± 1σ (Ma)	207Pb* 235U	± 1σ (Ma)	206Pb* 207Pb*	± 1σ (Ma)	**Best Age (Ma)**	**± 1σ (Ma)**	% conc
Sample 19AR10: (Lat/Long: 29.648425, 86.350452)--NAD 1983 coordinate system																			
19AR10 Spot 1	1813.80	30912.42	1.64	18.77	0.98	0.06	1.96	0.01	1.69	0.87	50.85	0.86	56.08	1.07	285.74	22.45	50.85	0.86	17.80
19AR10 Spot 2	237.72	11497.67	1.25	21.02	1.63	0.05	1.94	0.01	1.02	0.52	53.13	0.54	51.49	0.98	NA	NA	53.13	0.54	NA
19AR10 Spot 3	484.20	191953.65	5.06	13.96	1.18	0.31	1.73	0.03	1.26	0.73	205.52	2.55	277.80	4.20	941.44	24.19	205.52	2.55	21.83
19AR10 Spot 4	635.15	8286.62	1.46	13.84	7.17	0.09	7.29	0.01	1.33	0.18	57.39	0.76	83.44	5.84	912.42	147.75	57.39	0.76	6.29
19AR10 Spot 5	265.51	13117.27	1.38	20.02	1.68	0.05	2.03	0.01	1.12	0.55	52.70	0.59	53.82	1.07	103.96	40.13	52.70	0.59	50.69
19AR10 Spot 6	1558.68	127591.32	1.43	20.63	1.03	0.06	1.57	0.01	1.18	0.75	54.57	0.64	55.14	0.84	80.08	24.52	54.57	0.64	68.14
19AR10 Spot 7	266.75	32029.02	1.14	20.54	1.67	0.06	2.21	0.01	1.45	0.65	54.05	0.78	54.60	1.18	79.18	39.69	54.05	0.78	68.25
19AR10 Spot 8	455.94	13415.66	1.14	20.99	1.86	0.05	2.39	0.01	1.49	0.62	52.15	0.77	50.91	1.19	NA	NA	52.15	0.77	NA
19AR10 Spot 9	292.06	17726.00	1.36	21.06	1.60	0.05	1.80	0.01	0.71	0.39	52.28	0.37	51.17	0.90	-0.69	NA	52.28	0.37	-7539.92
19AR10 Spot 10	136.55	7124.74	1.18	21.81	2.18	0.05	2.57	0.01	1.08	0.42	52.51	0.57	48.29	1.21	NA	NA	52.51	0.57	NA
19AR10 Spot 11	351.98	64869.74	1.24	20.79	1.39	0.06	2.06	0.01	1.51	0.74	60.43	0.91	60.54	1.21	64.91	33.11	60.43	0.91	93.10
19AR10 Spot 12	345.10	33310.75	1.71	21.46	1.53	0.05	1.93	0.01	1.10	0.57	53.54	0.58	51.90	0.98	NA	NA	53.54	0.58	NA
19AR10 Spot 13	187.31	6957.27	1.36	21.01	1.88	0.05	2.08	0.01	0.83	0.40	53.27	0.44	50.90	1.03	NA	NA	53.27	0.44	NA
19AR10 Spot 14	146.15	31038.35	1.56	21.20	2.20	0.05	2.36	0.01	0.84	0.36	54.46	0.46	53.38	1.23	4.91	NA	54.46	0.46	1109.64
19AR10 Spot 15	146.52	46382.86	1.40	21.31	2.26	0.05	2.47	0.01	1.01	0.41	52.37	0.53	51.27	1.24	0.19	NA	52.37	0.53	26930.57
19AR10 Spot 16	190.99	6148.52	1.01	18.33	3.53	0.06	4.03	0.01	1.00	0.25	52.83	0.53	57.77	2.26	267.44	89.57	52.83	0.53	19.76
19AR10 Spot 17	220.17	257823.39	1.48	21.46	1.70	0.05	2.01	0.01	1.08	0.54	52.64	0.57	51.49	1.01	NA	NA	52.64	0.57	NA
19AR10 Spot 18	141.72	7110.46	1.03	15.49	6.07	0.07	6.28	0.01	1.05	0.17	53.45	0.56	69.60	4.22	667.28	132.67	53.45	0.56	8.01
19AR10 Spot 19	178.65	208250.51	1.53	21.09	1.97	0.06	2.24	0.01	1.07	0.48	54.90	0.59	54.56	1.19	39.64	NA	54.90	0.59	138.49
19AR10 Spot 20	469.73	116841.47	1.22	20.85	1.23	0.06	1.96	0.01	1.52	0.78	54.65	0.83	54.88	1.05	64.82	29.38	54.65	0.83	84.31
19AR10 Spot 21	222.92	22085.29	1.08	20.56	1.50	0.05	1.94	0.01	1.19	0.62	52.25	0.62	52.65	0.99	70.97	36.34	52.25	0.62	73.63
19AR10 Spot 22	275.26	88385.39	1.78	20.31	1.21	0.06	1.65	0.01	1.12	0.68	57.28	0.64	58.87	0.94	123.96	28.47	57.28	0.64	46.21
19AR10 Spot 23	227.22	22560.41	1.15	15.14	5.85	0.07	6.12	0.01	1.78	0.29	53.21	0.94	72.40	4.28	763.69	123.53	53.21	0.94	6.97
19AR10 Spot 24	574.42	140604.37	1.31	21.08	1.03	0.05	1.51	0.01	1.11	0.73	54.31	0.60	53.97	0.80	38.51	24.54	54.31	0.60	141.05
19AR10 Spot 25	771.68	67011.68	1.19	20.92	1.10	0.05	1.80	0.01	1.42	0.79	53.96	0.76	53.91	0.95	51.35	26.40	53.96	0.76	105.10
19AR10 Spot 26	129.43	22370.36	1.51	20.94	2.46	0.05	2.65	0.01	0.98	0.37	53.05	0.52	52.46	1.36	25.82	NA	53.05	0.52	205.48
19AR10 Spot 27	261.69	9418.13	1.28	20.59	1.37	0.05	1.78	0.01	1.14	0.64	54.08	0.61	53.35	0.93	20.77	NA	54.08	0.61	260.37
19AR10 Spot 28	120.99	5984.94	1.30	21.35	2.61	0.05	2.79	0.01	0.93	0.34	55.40	0.52	51.63	1.40	NA	NA	55.40	0.52	NA
19AR10 Spot 29	403.86	15271.39	1.04	21.10	1.25	0.05	1.88	0.01	1.31	0.70	52.98	0.69	51.66	0.95	NA	NA	52.98	0.69	NA
19AR10 Spot 30	136.92	477173.80	1.88	20.17	2.09	0.06	2.37	0.01	1.11	0.47	56.80	0.63	58.94	1.36	146.65	49.09	56.80	0.63	38.73
19AR10 Spot 31	2825.77	192315.76	15.54	20.76	0.53	0.05	0.99	0.01	0.84	0.85	52.32	0.44	52.87	0.51	77.44	12.57	52.32	0.44	67.56
19AR10 Spot 32	267.76	917250.57	1.49	20.68	2.26	0.05	2.68	0.01	1.45	0.54	52.99	0.76	53.80	1.40	90.02	53.52	52.99	0.76	58.87
19AR10 Spot 33	607.85	701610.99	0.59	20.95	1.30	0.05	1.74	0.01	1.15	0.66	52.46	0.60	52.59	0.89	58.39	30.96	52.46	0.60	89.85
19AR10 Spot 34	449.74	95343.84	0.64	21.00	1.53	0.05	1.81	0.01	0.96	0.53	52.79	0.51	52.65	0.93	46.37	36.51	52.79	0.51	113.83
19AR10 Spot 35	139.54	16112.58	1.58	21.41	2.97	0.05	3.15	0.01	0.95	0.30	53.38	0.50	51.40	1.58	NA	NA	53.38	0.50	NA
19AR10 Spot 36	490.98	47800.35	1.96	20.83	1.45	0.05	1.75	0.01	0.98	0.56	53.81	0.53	53.90	0.92	57.98	34.52	53.81	0.53	92.81
19AR10 Spot 37	697.31	190967.46	1.45	21.20	1.32	0.06	2.09	0.01	1.62	0.78	59.56	0.96	58.82	1.19	28.71	NA	59.56	0.96	207.47
19AR10 Spot 38	115.58	5349.69	1.31	20.79	2.90	0.05	3.75	0.01	0.95	0.25	53.02	0.50	50.58	1.85	NA	NA	53.02	0.50	NA
19AR10 Spot 39	929.91	72188.67	1.89	20.97	0.99	0.06	1.47	0.01	1.09	0.74	56.47	0.61	56.28	0.81	48.15	23.65	56.47	0.61	117.28
19AR10 Spot 40	118.51	8020.38	1.38	20.99	2.75	0.05	3.59	0.01	1.13	0.32	53.98	0.61	51.99	1.82	NA	NA	53.98	0.61	NA
19AR10 Spot 41	2363.22	228621.72	1.40	21.09	0.77	0.05	1.46	0.01	1.25	0.85	53.31	0.66	53.06	0.76	41.63	18.38	53.31	0.66	128.05
19AR10 Spot 42	113.18	66562.27	1.65	21.88	2.91	0.05	3.05	0.01	0.93	0.30	54.87	0.51	52.43	1.56	NA	NA	54.87	0.51	NA
19AR10 Spot 43	167.96	6334.63	1.33	20.63	2.15	0.05	2.42	0.01	1.05	0.44	52.90	0.55	51.31	1.21	NA	NA	52.90	0.55	NA
19AR10 Spot 44	192.54	4252.37	1.56	20.14	2.82	0.05	3.14	0.01	1.33	0.42	53.07	0.70	51.51	1.58	NA	NA	53.07	0.70	NA
19AR10 Spot 45	271.01	352452.52	1.52	17.49	1.85	0.07	2.19	0.01	1.17	0.54	55.16	0.64	65.80	1.39	472.21	40.92	55.16	0.64	11.68
19AR10 Spot 46	308.48	10106.78	0.95	19.75	1.64	0.05	2.38	0.01	1.05	0.44	52.37	0.55	54.13	1.25	132.53	50.20	52.37	0.55	39.52
19AR10 Spot 47	297.87	97022.40	1.37	20.59	1.77	0.06	2.23	0.01	1.35	0.61	53.82	0.72	54.77	1.19	96.55	41.91	53.82	0.72	55.74
19AR10 Spot 48	269.60	6133.78	1.49	21.40	1.53	0.05	1.81	0.01	0.94	0.52	54.02	0.50	50.41	0.89	NA	NA	54.02	0.50	NA
19AR10 Spot 49	292.22	12731.42	1.09	21.06	1.85	0.05	2.06	0.01	0.84	0.41	52.55	0.44	51.24	1.03	NA	NA	52.55	0.44	NA
19AR10 Spot 50	242.93	128847.89	1.34	21.08	2.26	0.05	2.51	0.01	1.09	0.43	52.80	0.57	52.56	1.29	41.81	NA	52.80	0.57	126.26

Table S2 (Continued). U/Pb igneous zircon geochronologic analyses by LA-ICP-MS

Analysis	Isotope Ratios										Apparent Ages (Ma)								
	U (ppm)	206Pb 204Pb	U/Th	206Pb* 207Pb*	± 1σ (%)	207Pb* 235U	± 1σ (%)	206Pb* 238U	± 1σ (%)	error corr.	206Pb* 238U	± 1σ (Ma)	207Pb* 235U	± 1σ (Ma)	206Pb* 207Pb*	± 1σ (Ma)	**Best Age (Ma)**	**± 1σ (Ma)**	% conc
Sample 19AR11: (Lat/Long: 29.64826, 86.352092)--NAD 1983 coordinate system																			
19AR11 Spot 54	175.33	5439.43	1.67	22.16	3.59	0.01	3.84	0.00	1.29	0.34	15.88	0.20	14.38	0.55	NA	NA	15.88	0.20	NA
19AR11 Spot 55	205.74	11491.69	2.43	20.86	2.46	0.02	2.76	0.00	1.26	0.45	23.15	0.29	22.99	0.63	6.84	NA	23.15	0.29	338.26
19AR11 Spot 56	451.61	5088.24	1.62	22.30	1.95	0.02	2.29	0.00	1.21	0.53	24.36	0.29	21.75	0.49	NA	NA	24.36	0.29	NA
19AR11 Spot 57	815.48	30790.37	1.27	19.37	2.91	0.03	3.08	0.00	0.89	0.29	24.30	0.22	26.42	0.80	223.27	68.17	24.30	0.22	10.88
19AR11 Spot 58	195.88	6128.44	1.34	22.52	3.00	0.01	4.21	0.00	1.36	0.32	15.97	0.22	14.32	0.60	NA	NA	15.97	0.22	NA
19AR11 Spot 59	187.74	4000.21	1.04	14.63	7.67	0.02	9.20	0.00	4.26	0.46	16.94	0.72	23.33	2.12	743.30	172.82	16.94	0.72	2.28
19AR11 Spot 60	179.10	7077.25	1.45	22.27	3.36	0.01	4.37	0.00	1.34	0.31	16.49	0.22	15.07	0.65	NA	NA	16.49	0.22	NA
19AR11 Spot 62	671.78	41468.68	0.76	21.17	1.07	0.04	1.50	0.01	1.05	0.70	43.76	0.46	43.26	0.63	15.85	NA	43.76	0.46	276.07
19AR11 Spot 64	220.95	17387.44	0.72	20.44	3.61	0.02	4.01	0.00	1.72	0.43	16.04	0.28	16.46	0.65	76.97	NA	16.04	0.28	20.85
19AR11 Spot 65	130.33	5238.16	1.78	18.66	4.37	0.02	5.36	0.00	1.39	0.26	16.36	0.23	17.71	0.94	204.97	120.09	16.36	0.23	7.98
19AR11 Spot 66	600.58	32447.75	1.72	19.66	2.14	0.03	2.54	0.00	1.37	0.54	24.65	0.34	26.37	0.66	185.45	49.85	24.65	0.34	13.29
19AR11 Spot 67	154.11	3312.28	1.20	19.20	3.35	0.02	3.90	0.00	1.76	0.45	15.80	0.28	16.03	0.62	50.36	NA	15.80	0.28	31.37
19AR11 Spot 69	483.44	14342.82	2.29	20.17	1.52	0.02	2.07	0.00	0.92	0.44	23.39	0.21	24.11	0.49	96.43	43.93	23.39	0.21	24.26
19AR11 Spot 71	677.39	8866.54	1.35	21.48	1.01	0.04	1.88	0.01	1.19	0.63	38.74	0.46	36.71	0.68	NA	NA	38.74	0.46	NA
19AR11 Spot 72	561.07	13812.72	1.92	21.35	1.35	0.04	1.68	0.01	0.98	0.59	38.38	0.38	37.09	0.61	NA	NA	38.38	0.38	NA
19AR11 Spot 73	211.40	11092.07	1.54	20.56	3.29	0.02	3.58	0.00	1.39	0.39	15.92	0.22	16.05	0.57	34.60	NA	15.92	0.22	46.02
19AR11 Spot 74	127.64	3719.47	1.02	13.55	9.54	0.02	9.86	0.00	2.10	0.21	16.26	0.34	24.12	2.35	900.19	199.11	16.26	0.34	1.81
19AR11 Spot 75	734.44	114576.76	1.73	21.19	1.45	0.04	1.89	0.01	1.21	0.64	39.44	0.48	39.15	0.73	21.42	NA	39.44	0.48	184.14
19AR11 Spot 76	464.99	8608.42	2.41	21.17	2.14	0.02	2.61	0.00	1.24	0.48	23.73	0.29	22.94	0.59	NA	NA	23.73	0.29	NA
19AR11 Spot 77	1205.61	23803.34	0.93	21.18	1.30	0.02	1.84	0.00	1.28	0.69	24.30	0.31	24.03	0.44	NA	NA	24.30	0.31	NA
19AR11 Spot 78	142.07	7502.25	1.34	19.65	4.33	0.02	4.66	0.00	1.72	0.37	16.17	0.28	16.85	0.78	114.43	102.28	16.17	0.28	14.13
19AR11 Spot 79	246.45	3028.68	1.17	19.78	3.69	0.02	4.29	0.00	2.13	0.50	16.20	0.34	15.76	0.67	NA	NA	16.20	0.34	NA
19AR11 Spot 80	1466.17	193736.31	2.48	21.23	1.25	0.04	1.65	0.01	1.07	0.65	37.89	0.41	37.60	0.61	19.59	NA	37.89	0.41	193.42
19AR11 Spot 81	295.03	6794.45	1.06	20.51	2.44	0.02	2.80	0.00	1.27	0.45	16.23	0.21	16.11	0.45	NA	NA	16.23	0.21	NA
19AR11 Spot 83	1562.01	153762.40	18.08	21.31	0.77	0.04	1.40	0.01	1.16	0.83	36.74	0.43	36.36	0.50	11.50	NA	36.74	0.43	319.46
19AR11 Spot 84	510.44	9897.69	2.10	21.15	1.46	0.02	1.81	0.00	1.06	0.58	24.56	0.26	23.90	0.43	NA	NA	24.56	0.26	NA
19AR11 Spot 85	743.27	40126.00	2.04	21.12	1.76	0.02	2.45	0.00	1.70	0.69	24.31	0.41	24.25	0.59	18.80	NA	24.31	0.41	129.28
19AR11 Spot 87	1836.05	38224.15	1.17	21.36	0.90	0.02	1.39	0.00	1.03	0.75	24.13	0.25	23.80	0.33	NA	NA	24.13	0.25	NA
19AR11 Spot 88	391.75	14380.08	3.23	20.45	2.12	0.02	2.55	0.00	1.31	0.51	23.61	0.31	24.02	0.61	64.96	52.07	23.61	0.31	36.35
19AR11 Spot 89	720.04	154332.51	0.89	20.49	2.15	0.02	2.63	0.00	1.52	0.58	15.81	0.24	16.41	0.43	105.10	50.81	15.81	0.24	15.04
19AR11 Spot 90	429.61	154678.46	4.33	20.46	2.37	0.02	2.90	0.00	1.66	0.57	21.39	0.36	22.19	0.64	109.58	56.03	21.39	0.36	19.52
19AR11 Spot 92	463.49	152308.75	1.60	21.64	2.49	0.02	2.79	0.00	1.26	0.45	23.21	0.29	22.75	0.63	NA	NA	23.21	0.29	NA
19AR11 Spot 93	535.52	130635.04	1.90	20.86	2.02	0.02	2.38	0.00	1.26	0.53	24.36	0.31	24.73	0.58	60.94	48.09	24.36	0.31	39.97
19AR11 Spot 94	700.27	13703.37	1.19	21.17	1.66	0.02	2.02	0.00	1.09	0.54	24.57	0.27	24.09	0.48	NA	NA	24.57	0.27	NA
19AR11 Spot 95	188.46	10537.49	1.39	20.34	2.92	0.02	3.28	0.00	1.48	0.45	16.45	0.24	16.74	0.55	57.55	NA	16.45	0.24	28.59
19AR11 Spot 97	311.28	5991.22	1.21	20.31	3.26	0.02	3.80	0.00	1.87	0.49	16.31	0.30	16.25	0.61	7.52	NA	16.31	0.30	216.80
19AR11 Spot 99	205.72	14749.63	1.34	19.48	3.95	0.02	4.16	0.00	1.28	0.31	16.21	0.21	17.37	0.72	181.56	92.21	16.21	0.21	8.93
19AR11 Spot 100	164.77	10634.02	1.38	20.60	4.18	0.02	4.59	0.00	1.83	0.40	16.39	0.30	16.47	0.75	27.87	NA	16.39	0.30	58.80

Table S2 (Continued). U/Pb igneous zircon geochronologic analyses by LA-ICP-MS																				
	Isotope Ratios											Apparent Ages (Ma)								
Analysis	U	206Pb	U/Th	206Pb*	± 1σ	207Pb*	± 1σ	206Pb*	± 1σ	error	206Pb*	± 1σ	207Pb*	± 1σ	206Pb*	± 1σ	Best Age	± 1σ	% conc
	(ppm)	204Pb		207Pb*	(%)	235U	(%)	238U	(%)	corr.	238U	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)	
Sample 19AR12: (Lat/Long: 29.647433, 86.356102)--NAD 1983 coordinate system																			
19AR12 Spot 101	136.88	6151.13	1.62	20.43	2.54	0.05	2.98	0.01	1.35	0.45	52.99	0.71	51.75	1.50	NA	NA	52.99	0.71	NA
19AR12 Spot 102	292.03	7575.47	1.97	21.24	1.54	0.05	2.46	0.01	1.89	0.77	52.37	0.99	49.61	1.19	NA	NA	52.37	0.99	NA
19AR12 Spot 103	384.76	35975.88	2.01	21.11	1.59	0.05	2.40	0.01	1.80	0.75	55.20	0.99	54.31	1.27	15.23	NA	55.20	0.99	362.51
19AR12 Spot 104	427.36	64490.60	1.69	20.71	1.61	0.06	2.31	0.01	1.65	0.71	58.11	0.95	58.40	1.31	70.28	38.41	58.11	0.95	82.69
19AR12 Spot 105	160.69	12632.45	1.15	20.99	2.56	0.05	3.43	0.01	2.20	0.64	53.59	1.18	52.20	1.74	NA	NA	53.59	1.18	NA
19AR12 Spot 106	647.21	111356.72	1.80	20.80	1.07	0.06	2.15	0.01	1.86	0.87	54.20	1.01	54.42	1.14	64.09	25.54	54.20	1.01	84.57
19AR12 Spot 107	228.88	7660.32	2.23	21.16	2.35	0.05	3.13	0.01	1.80	0.58	53.33	0.96	50.72	1.55	NA	NA	53.33	0.96	NA
19AR12 Spot 108	777.68	44505.84	1.20	21.35	1.29	0.05	2.12	0.01	1.68	0.79	53.77	0.90	52.43	1.08	NA	NA	53.77	0.90	NA
19AR12 Spot 109	1244.85	65634.72	1.76	20.62	1.22	0.06	1.80	0.01	1.32	0.73	54.08	0.71	54.65	0.96	79.82	29.29	54.08	0.71	67.75
19AR12 Spot 110	182.76	4749.12	2.00	21.90	1.97	0.05	2.49	0.01	1.49	0.60	54.55	0.81	48.70	1.18	NA	NA	54.55	0.81	NA
19AR12 Spot 111	223.47	27950.61	1.67	21.30	1.71	0.05	2.45	0.01	1.75	0.72	54.61	0.95	53.09	1.27	NA	NA	54.61	0.95	NA
19AR12 Spot 112	279.12	30277.25	1.33	21.81	1.80	0.05	2.20	0.01	1.27	0.58	53.25	0.67	50.67	1.09	NA	NA	53.25	0.67	NA
19AR12 Spot 113	479.67	184577.15	2.09	20.73	1.60	0.06	2.74	0.01	2.22	0.81	57.65	1.27	58.04	1.54	74.40	38.00	57.65	1.27	77.48
19AR12 Spot 114	201.08	42813.72	2.00	20.17	2.51	0.06	2.94	0.01	1.53	0.52	54.35	0.83	55.98	1.60	126.09	59.09	54.35	0.83	43.11
19AR12 Spot 115	788.37	53143.45	2.02	21.12	1.26	0.06	2.34	0.01	1.96	0.84	59.27	1.16	58.32	1.33	19.58	NA	59.27	1.16	302.67
19AR12 Spot 116	742.75	23215.01	2.06	20.63	1.36	0.06	2.17	0.01	1.55	0.72	57.93	0.90	57.94	1.22	58.62	36.10	57.93	0.90	98.81
19AR12 Spot 117	222.10	15053.55	1.23	21.21	2.28	0.05	2.85	0.01	1.66	0.58	54.71	0.90	52.96	1.47	NA	NA	54.71	0.90	NA
19AR12 Spot 118	215.42	10309.07	1.30	21.04	1.85	0.05	2.59	0.01	1.78	0.69	52.88	0.94	51.15	1.29	NA	NA	52.88	0.94	NA
19AR12 Spot 119	160.47	30099.52	0.88	21.36	2.21	0.05	2.69	0.01	1.52	0.57	54.04	0.82	52.52	1.38	NA	NA	54.04	0.82	NA
19AR12 Spot 120	97.82	3041.25	1.85	20.63	3.13	0.05	4.82	0.01	1.43	0.30	54.77	0.78	50.14	2.36	NA	NA	54.77	0.78	NA
19AR12 Spot 121	522.72	21311.71	1.16	18.98	2.84	0.06	3.21	0.01	1.50	0.47	54.22	0.81	58.98	1.84	256.49	65.38	54.22	0.81	21.14
19AR12 Spot 122	261.15	29623.16	1.96	21.18	1.51	0.05	2.03	0.01	1.33	0.65	52.83	0.70	51.80	1.03	4.54	NA	52.83	0.70	1164.70
19AR12 Spot 123	225.82	169166.37	1.67	20.65	2.00	0.06	2.48	0.01	1.47	0.59	55.19	0.81	55.88	1.35	85.44	47.51	55.19	0.81	64.60
19AR12 Spot 124	262.90	235598.01	2.29	21.51	1.80	0.06	2.32	0.01	1.47	0.63	57.73	0.84	56.15	1.27	NA	NA	57.73	0.84	NA
19AR12 Spot 125	196.57	5317.81	1.87	21.55	1.47	0.05	2.12	0.01	1.52	0.71	52.68	0.80	48.31	1.00	NA	NA	52.68	0.80	NA
19AR12 Spot 126	214.86	15103.72	1.97	20.29	2.18	0.06	2.71	0.01	1.58	0.58	55.27	0.87	55.96	1.47	85.67	52.20	55.27	0.87	64.51
19AR12 Spot 127	311.44	14938.63	2.04	21.01	1.41	0.06	2.40	0.01	1.94	0.81	56.82	1.10	55.52	1.30	-0.11	NA	56.82	1.10	-53449.84
19AR12 Spot 128	267.55	15908.01	1.59	21.17	1.51	0.06	2.52	0.01	1.97	0.78	59.52	1.17	57.73	1.42	NA	NA	59.52	1.17	NA
19AR12 Spot 129	153.00	12363.13	2.28	20.37	2.39	0.05	3.01	0.01	1.33	0.44	53.73	0.71	53.99	1.58	65.74	64.15	53.73	0.71	81.74
19AR12 Spot 130	318.58	150158.28	1.91	20.97	1.40	0.05	1.80	0.01	1.13	0.63	53.27	0.60	53.20	0.93	49.85	33.35	53.27	0.60	106.87
19AR12 Spot 131	968.29	37375.32	2.05	20.98	1.00	0.06	1.85	0.01	1.55	0.84	57.94	0.90	57.39	1.03	34.53	24.09	57.94	0.90	167.79
19AR12 Spot 132	106.86	155603.45	1.58	20.84	2.42	0.06	2.88	0.01	1.55	0.54	54.47	0.84	54.72	1.53	65.34	57.63	54.47	0.84	83.37
19AR12 Spot 133	188.61	11293.43	1.37	20.98	2.32	0.05	2.83	0.01	1.57	0.56	53.30	0.84	51.90	1.43	NA	NA	53.30	0.84	NA
19AR12 Spot 134	258.64	11608.63	1.89	21.64	2.00	0.05	2.59	0.01	1.58	0.61	54.30	0.85	51.25	1.29	NA	NA	54.30	0.85	NA
19AR12 Spot 135	169.11	4291.21	1.67	19.81	2.40	0.05	3.00	0.01	1.79	0.60	52.99	0.94	52.32	1.53	21.91	NA	52.99	0.94	241.84
19AR12 Spot 136	129.85	5047.70	1.68	20.19	2.74	0.05	4.52	0.01	1.73	0.38	53.52	0.92	52.36	2.31	-0.47	NA	53.52	0.92	-11364.25
19AR12 Spot 137	276.18	107936.73	1.64	20.42	1.98	0.06	2.67	0.01	1.80	0.67	53.66	0.96	54.93	1.43	110.70	46.67	53.66	0.96	48.48
19AR12 Spot 138	1212.95	171389.23	1.23	21.26	1.09	0.06	1.63	0.01	1.22	0.75	55.60	0.67	54.73	0.87	16.98	NA	55.60	0.67	327.42
19AR12 Spot 139	1705.56	135844.68	1.25	21.22	1.03	0.05	1.92	0.01	1.61	0.84	54.25	0.87	53.50	1.00	19.97	NA	54.25	0.87	271.61
19AR12 Spot 140	150.31	19076.37	1.82	20.48	1.89	0.05	2.34	0.01	1.37	0.58	52.87	0.72	53.30	1.21	72.59	45.04	52.87	0.72	72.84
19AR12 Spot 141	278.44	9229.94	1.62	21.06	1.43	0.05	1.97	0.01	1.32	0.67	53.65	0.71	51.64	0.99	NA	NA	53.65	0.71	NA
19AR12 Spot 142	838.88	31214.02	0.69	21.05	1.21	0.05	1.95	0.01	1.53	0.79	53.55	0.82	52.81	1.00	19.33	NA	53.55	0.82	277.01
19AR12 Spot 143	893.17	29159.47	2.61	21.26	1.53	0.06	2.15	0.01	1.51	0.70	56.45	0.85	55.02	1.15	NA	NA	56.45	0.85	NA
19AR12 Spot 144	789.72	28797.89	1.87	21.28	1.41	0.05	2.12	0.01	1.57	0.74	55.81	0.87	54.36	1.12	NA	NA	55.81	0.87	NA
19AR12 Spot 145	289.84	31500.50	1.57	20.76	2.01	0.05	2.78	0.01	1.91	0.69	53.61	1.02	53.61	1.45	53.49	48.11	53.61	1.02	100.23
19AR12 Spot 146	325.35	211791.16	1.33	21.16	1.37	0.05	2.04	0.01	1.51	0.74	54.66	0.82	54.06	1.07	27.55	NA	54.66	0.82	198.38
19AR12 Spot 147	205.65	21565.75	1.34	21.29	2.45	0.05	3.33	0.01	2.24	0.67	53.56	1.20	52.00	1.69	NA	NA	53.56	1.20	NA
19AR12 Spot 148	362.89	29657.52	1.96	21.27	1.91	0.06	2.82	0.01	2.08	0.74	57.41	1.19	55.94	1.54	NA	NA	57.41	1.19	NA
19AR12 Spot 149	334.16	34453.04	2.50	20.42	1.45	0.06	2.17	0.01	1.61	0.74	55.94	0.90	56.86	1.20	95.70	34.50	55.94	0.90	58.46
19AR12 Spot 150	195.28	21048.29	1.51	21.24	1.68	0.05	2.47	0.01	1.69	0.69	53.37	0.90	51.91	1.25	NA	NA	53.37	0.90	NA

Table S2 (Continued). U/Pb igneous zircon geochronologic analyses by LA-ICP-MS																					
	Isotope Ratios											Apparent Ages (Ma)									
Analysis	U	206Pb	U/Th	206Pb*	± 1σ	207Pb*	± 1σ	206Pb*	± 1σ	error		206Pb*	± 1σ	207Pb*	± 1σ	206Pb*	± 1σ	Best Age	± 1σ	% conc	
	(ppm)	204Pb		207Pb*	(%)	235U	(%)	238U	(%)	corr.		238U	(Ma)	235U	(Ma)	207Pb*	(Ma)	(Ma)	(Ma)		
Sample 19AR15: (Lat/Long: 29.720758, 86.166673)--NAD 1983 coordinate system																					
19AR15 Spot 101	212.12	25319.78	1.24	13.36	5.44	0.08	5.56	0.01	1.13	0.20		52.66	0.59	81.36	4.35	1035.18	110.05	52.66	0.59	5.09	
19AR15 Spot 102	324.66	8515.02	1.09	20.41	1.86	0.05	2.35	0.01	1.42	0.60		49.38	0.70	49.34	1.13	47.46	44.72	49.38	0.70	104.05	
19AR15 Spot 103	133.33	3795.40	1.10	20.74	2.41	0.05	2.84	0.01	1.48	0.52		48.98	0.72	45.96	1.27	NA	NA	48.98	0.72	NA	
19AR15 Spot 104	273.67	6028.41	0.92	21.30	2.33	0.05	2.75	0.01	1.42	0.52		50.01	0.71	47.09	1.26	NA	NA	50.01	0.71	NA	
19AR15 Spot 105	594.95	27157.42	1.38	21.82	1.66	0.05	2.10	0.01	1.18	0.56		50.28	0.59	48.16	0.99	NA	NA	50.28	0.59	NA	
19AR15 Spot 106	610.38	19414.71	1.50	21.15	1.53	0.05	2.27	0.01	1.67	0.74		49.28	0.82	48.48	1.08	9.31	NA	49.28	0.82	529.28	
19AR15 Spot 107	180.42	11736.37	1.11	20.59	2.13	0.05	2.38	0.01	0.99	0.42		51.07	0.50	51.03	1.18	49.44	NA	51.07	0.50	103.28	
19AR15 Spot 108	515.98	42673.66	1.74	21.19	1.27	0.05	2.06	0.01	1.62	0.79		49.94	0.81	49.47	1.00	26.71	NA	49.94	0.81	186.99	
19AR15 Spot 109	367.89	16467.50	1.07	21.57	2.16	0.05	2.64	0.01	1.50	0.57		49.09	0.73	47.27	1.22	NA	NA	49.09	0.73	NA	
19AR15 Spot 110	349.36	10856.94	1.36	21.63	2.39	0.05	2.65	0.01	1.14	0.43		50.60	0.57	48.07	1.25	NA	NA	50.60	0.57	NA	
19AR15 Spot 111	719.84	50804.10	1.52	20.76	1.43	0.05	1.97	0.01	1.34	0.68		49.90	0.67	50.56	0.97	82.29	34.12	49.90	0.67	60.64	
19AR15 Spot 112	332.26	19941.01	1.73	21.38	1.57	0.05	2.27	0.01	1.62	0.72		50.34	0.81	49.05	1.09	NA	NA	50.34	0.81	NA	
19AR15 Spot 113	538.00	174155.91	1.26	21.26	1.26	0.05	1.99	0.01	1.54	0.77		49.58	0.76	49.25	0.96	33.34	30.15	49.58	0.76	148.72	
19AR15 Spot 114	166.07	8861.96	0.82	19.84	2.25	0.05	3.05	0.01	1.14	0.37		48.31	0.55	49.79	1.48	121.85	66.57	48.31	0.55	39.65	
19AR15 Spot 115	424.72	57536.81	1.27	21.05	1.42	0.05	2.03	0.01	1.44	0.71		50.09	0.72	50.06	0.99	48.58	33.97	50.09	0.72	103.11	
19AR15 Spot 116	284.72	103280.15	1.20	21.42	2.22	0.05	2.50	0.01	1.15	0.46		51.42	0.59	50.62	1.23	12.67	NA	51.42	0.59	405.75	
19AR15 Spot 117	327.17	9075.36	1.36	21.65	1.53	0.05	1.95	0.01	1.21	0.62		49.91	0.60	47.09	0.90	NA	NA	49.91	0.60	NA	
19AR15 Spot 119	206.84	15290.24	0.87	21.03	2.48	0.05	2.91	0.01	1.50	0.52		48.62	0.73	47.91	1.36	12.13	NA	48.62	0.73	400.80	
19AR15 Spot 120	209.49	5826.54	2.07	14.47	3.66	0.07	4.07	0.01	1.39	0.34		50.72	0.70	70.72	2.78	813.43	80.06	50.72	0.70	6.24	
19AR15 Spot 121	384.40	131131.58	1.71	21.38	1.36	0.05	1.86	0.01	1.27	0.68		50.95	0.64	50.25	0.91	16.95	NA	50.95	0.64	300.55	
19AR15 Spot 122	179.75	19123.81	1.14	20.54	2.09	0.06	2.42	0.01	1.22	0.50		54.02	0.66	54.61	1.29	80.40	49.63	54.02	0.66	67.19	
19AR15 Spot 123	100.40	5711.83	0.80	20.12	3.40	0.05	3.72	0.01	1.47	0.40		48.80	0.72	48.66	1.77	41.76	NA	48.80	0.72	116.85	
19AR15 Spot 124	354.53	13580.24	1.35	20.75	1.53	0.05	2.37	0.01	1.65	0.70		49.53	0.81	49.35	1.14	40.68	40.69	49.53	0.81	121.76	
19AR15 Spot 125	578.03	91130.93	1.78	21.23	1.56	0.05	2.04	0.01	1.32	0.65		51.09	0.67	50.70	1.01	32.38	NA	51.09	0.67	157.77	
19AR15 Spot 126	403.33	88860.97	1.30	16.99	4.06	0.06	4.36	0.01	1.59	0.37		50.37	0.80	62.13	2.63	542.59	88.87	50.37	0.80	9.28	
19AR15 Spot 127	478.88	12066.80	3.34	20.71	1.21	0.05	1.67	0.01	1.14	0.68		51.17	0.58	50.89	0.83	38.14	29.17	51.17	0.58	134.16	
19AR15 Spot 128	954.07	65399.54	1.80	21.30	0.99	0.05	1.64	0.01	1.31	0.80		49.44	0.65	48.85	0.78	20.25	NA	49.44	0.65	244.19	
19AR15 Spot 129	1068.93	34481.19	2.60	20.85	1.24	0.05	1.82	0.01	1.34	0.73		50.36	0.67	50.60	0.90	62.04	29.54	50.36	0.67	81.18	
19AR15 Spot 130	125.85	13163.07	1.07	21.47	2.82	0.05	3.07	0.01	1.18	0.38		49.40	0.58	47.53	1.42	NA	NA	49.40	0.58	NA	
19AR15 Spot 131	99.97	11879.45	2.03	19.55	2.84	0.06	3.10	0.01	1.24	0.40		53.79	0.66	56.62	1.70	178.13	66.16	53.79	0.66	30.20	
19AR15 Spot 132	261.34	42315.55	1.33	20.88	2.07	0.05	2.37	0.01	1.10	0.47		50.61	0.56	50.86	1.17	62.48	49.90	50.61	0.56	81.00	
19AR15 Spot 133	267.35	8928.14	1.10	21.70	2.64	0.05	2.96	0.01	1.16	0.39		48.67	0.56	45.81	1.33	NA	NA	48.67	0.56	NA	
19AR15 Spot 134	369.26	31402.45	1.28	21.87	1.66	0.05	2.19	0.01	1.33	0.61		51.49	0.68	49.30	1.05	NA	NA	51.49	0.68	NA	
19AR15 Spot 135	397.96	24500.90	1.75	21.46	1.73	0.05	2.46	0.01	1.62	0.66		51.01	0.82	49.63	1.19	NA	NA	51.01	0.82	NA	
19AR15 Spot 136	73.45	17544.28	0.84	20.86	3.52	0.05	3.77	0.01	1.35	0.36		48.90	0.66	48.71	1.79	39.27	NA	48.90	0.66	124.50	
19AR15 Spot 137	193.21	37461.23	1.47	20.87	2.21	0.05	2.55	0.01	1.27	0.50		50.26	0.64	50.49	1.26	61.25	52.67	50.26	0.64	82.06	
19AR15 Spot 138	164.03	7018.80	1.22	21.63	2.01	0.05	2.55	0.01	1.43	0.56		49.79	0.71	46.53	1.16	NA	NA	49.79	0.71	NA	
19AR15 Spot 139	228.52	23295.65	0.98	21.56	2.41	0.05	2.85	0.01	1.53	0.54		48.96	0.74	47.41	1.32	NA	NA	48.96	0.74	NA	
19AR15 Spot 140	367.66	21240.12	1.41	21.25	1.92	0.05	2.33	0.01	1.30	0.56		50.45	0.65	49.46	1.12	1.86	NA	50.45	0.65	2718.06	
19AR15 Spot 141	594.28	518544.46	1.38	21.48	1.68	0.05	2.37	0.01	1.67	0.70		49.97	0.83	49.13	1.14	8.26	NA	49.97	0.83	605.22	
19AR15 Spot 142	304.89	436700.99	2.01	17.19	3.03	0.06	3.20	0.01	1.04	0.33		52.10	0.54	63.56	1.97	519.72	66.44	52.10	0.54	10.02	
19AR15 Spot 143	123.62	6753.02	0.87	21.75	3.01	0.05	3.41	0.01	1.59	0.46		49.89	0.79	46.21	1.54	NA	NA	49.89	0.79	NA	
19AR15 Spot 144	217.79	13238.07	1.22	21.58	1.79	0.05	2.40	0.01	1.54	0.64		49.59	0.76	47.42	1.11	NA	NA	49.59	0.76	NA	
19AR15 Spot 145	300.95	16197.67	1.52	21.49	1.85	0.05	2.47	0.01	1.29	0.52		49.35	0.64	47.62	1.15	NA	NA	49.35	0.64	NA	
19AR15 Spot 146	149.41	303975.65	0.87	12.56	7.54	0.09	7.69	0.01	1.50	0.19		51.47	0.77	85.04	6.27	1172.91	149.41	51.47	0.77	4.39	
19AR15 Spot 147	336.35	28532.01	1.55	21.20	1.68	0.05	2.33	0.01	1.61	0.69		50.03	0.80	49.30	1.12	14.19	NA	50.03	0.80	352.60	
19AR15 Spot 148	136.81	7872.51	0.94	20.50	2.80	0.05	3.19	0.01	1.47	0.46		49.98	0.73	49.52	1.54	27.51	NA	49.98	0.73	181.71	
19AR15 Spot 149	312.45	23655.09	1.54	20.43	1.75	0.05	2.12	0.01	1.02	0.48		50.25	0.51	51.25	1.06	98.21	44.08	50.25	0.51	51.16	
19AR15 Spot 150	146.88	6509.27	1.51	20.98	2.29	0.05	3.71	0.01	1.49	0.40		49.35	0.73	47.42	1.72	NA	NA	49.35	0.73	NA	

Table S2 (Continued). U/Pb igneous zircon geochronologic analyses by LA-ICP-MS

Analysis	Isotope Ratios										Apparent Ages (Ma)						Best Age	± 1σ	% conc
	U (ppm)	206Pb 204Pb	U/Th	206Pb* 207Pb*	± 1σ (%)	207Pb* 235U	± 1σ (%)	206Pb* 238U	± 1σ (%)	error corr.	206Pb* 238U	± 1σ (Ma)	207Pb* 235U	± 1σ (Ma)	206Pb* 207Pb*	± 1σ (Ma)	(Ma)	(Ma)	
Sample 19AR16: (Lat/Long: 29.735243, 86.290704)--NAD 1983 coordinate system																			
19AR16 Spot 51	1052.90	17726.24	0.36	21.13	1.07	0.05	1.51	0.01	1.06	0.70	48.77	0.52	47.64	0.70	NA	NA	48.77	0.52	NA
19AR16 Spot 52	159.47	5659.49	1.05	21.71	3.30	0.05	3.57	0.01	1.09	0.30	50.05	0.54	45.75	1.60	NA	NA	50.05	0.54	NA
19AR16 Spot 54	218.81	6669.50	1.12	21.01	2.22	0.05	2.48	0.01	1.00	0.40	56.61	0.56	53.80	1.30	NA	NA	56.61	0.56	NA
19AR16 Spot 55	307.58	4697.26	1.16	20.95	2.44	0.05	2.73	0.01	1.11	0.41	49.56	0.55	46.43	1.24	NA	NA	49.56	0.55	NA
19AR16 Spot 56	336.88	9168.51	1.09	20.95	2.18	0.05	2.44	0.01	1.06	0.44	49.18	0.52	47.64	1.13	NA	NA	49.18	0.52	NA
19AR16 Spot 59	128.07	5919.85	1.08	21.46	3.06	0.04	3.35	0.01	1.32	0.39	47.76	0.63	44.31	1.45	NA	NA	47.76	0.63	NA
19AR16 Spot 60	290.97	5973.51	1.17	20.63	2.30	0.05	2.74	0.01	1.09	0.40	50.48	0.55	48.77	1.30	NA	NA	50.48	0.55	NA
19AR16 Spot 62	252.49	11152.02	0.90	20.72	2.70	0.05	3.07	0.01	1.38	0.45	49.87	0.69	49.15	1.47	14.24	NA	49.87	0.69	350.08
19AR16 Spot 63	286.57	5872.63	0.53	7.61	14.76	0.15	14.90	0.01	1.83	0.12	55.68	1.02	144.04	20.00	2062.88	262.22	55.68	1.02	2.70
19AR16 Spot 64	218.78	3895.49	0.86	20.02	2.73	0.05	3.33	0.01	1.28	0.38	48.66	0.62	47.20	1.53	NA	NA	48.66	0.62	NA
19AR16 Spot 65	474.26	32420.06	0.70	21.05	1.87	0.05	2.09	0.01	0.92	0.44	49.01	0.45	48.45	0.99	20.67	NA	49.01	0.45	237.12
19AR16 Spot 68	482.41	9373.86	1.10	18.94	1.82	0.05	2.06	0.01	0.94	0.46	49.33	0.46	52.95	1.06	219.88	42.42	49.33	0.46	22.44
19AR16 Spot 69	179.26	9159.13	0.66	21.95	3.08	0.05	3.40	0.01	1.28	0.38	49.53	0.63	45.78	1.52	NA	NA	49.53	0.63	NA
19AR16 Spot 70	305.89	14936.32	1.22	20.84	2.07	0.05	2.32	0.01	1.00	0.43	48.71	0.48	48.07	1.09	16.42	NA	48.71	0.48	296.60
19AR16 Spot 71	368.18	183451.60	0.95	20.84	2.09	0.05	2.37	0.01	1.10	0.47	48.67	0.53	48.95	1.13	62.47	49.90	48.67	0.53	77.91
19AR16 Spot 72	243.73	11108.28	0.83	21.03	2.35	0.05	2.66	0.01	1.19	0.45	49.01	0.58	47.57	1.24	NA	NA	49.01	0.58	NA
19AR16 Spot 74	259.93	4442.79	1.13	20.91	1.91	0.05	2.13	0.01	0.91	0.43	49.41	0.45	46.21	0.96	NA	NA	49.41	0.45	NA
19AR16 Spot 75	236.53	12691.85	0.84	20.49	2.51	0.05	2.96	0.01	0.99	0.34	51.05	0.51	51.02	1.47	49.19	NA	51.05	0.51	103.80
19AR16 Spot 76	162.50	8812.68	0.84	19.72	3.78	0.05	3.96	0.01	1.16	0.29	49.68	0.57	51.09	1.97	117.51	89.31	49.68	0.57	42.28
19AR16 Spot 77	490.56	26893.29	3.18	21.30	2.03	0.06	2.54	0.01	1.53	0.60	57.41	0.87	55.76	1.38	NA	NA	57.41	0.87	NA
19AR16 Spot 78	720.55	11548.61	1.50	21.63	1.44	0.05	2.17	0.01	1.20	0.55	50.04	0.60	47.26	1.00	NA	NA	50.04	0.60	NA
19AR16 Spot 79	236.99	20105.53	0.97	22.05	2.46	0.05	2.72	0.01	1.16	0.42	48.86	0.56	45.82	1.22	NA	NA	48.86	0.56	NA
19AR16 Spot 80	226.90	22605.67	0.68	19.69	3.88	0.05	4.07	0.01	1.21	0.30	49.53	0.60	52.05	2.06	169.27	90.77	49.53	0.60	29.26
19AR16 Spot 81	123.21	6648.87	1.00	12.54	5.60	0.09	5.72	0.01	1.16	0.20	51.70	0.60	82.97	4.56	1113.06	111.93	51.70	0.60	4.64
19AR16 Spot 82	247.58	9127.55	1.16	20.50	2.72	0.05	3.11	0.01	1.28	0.41	49.16	0.62	48.73	1.48	27.66	NA	49.16	0.62	177.73
19AR16 Spot 83	165.65	6609.57	1.09	20.48	2.72	0.05	2.95	0.01	1.08	0.37	50.09	0.54	49.05	1.41	NA	NA	50.09	0.54	NA
19AR16 Spot 84	349.26	6844.06	0.71	19.38	2.78	0.05	3.42	0.01	1.31	0.38	50.15	0.65	52.05	1.74	140.35	74.29	50.15	0.65	35.73
19AR16 Spot 85	313.18	4585.87	0.89	20.43	2.33	0.05	2.70	0.01	1.37	0.51	48.66	0.66	46.84	1.24	NA	NA	48.66	0.66	NA
19AR16 Spot 86	433.28	6649.56	1.73	21.09	1.50	0.06	1.89	0.01	1.09	0.58	65.52	0.71	61.96	1.14	NA	NA	65.52	0.71	NA
19AR16 Spot 87	1402.25	36061.11	1.77	21.04	1.03	0.07	1.53	0.01	1.12	0.73	65.11	0.72	64.20	0.95	30.58	25.06	65.11	0.72	212.91
19AR16 Spot 88	258.92	9366.12	0.98	20.85	2.24	0.05	2.52	0.01	1.12	0.44	49.45	0.55	48.30	1.19	NA	NA	49.45	0.55	NA
19AR16 Spot 89	341.26	63220.75	0.77	22.15	2.42	0.05	2.61	0.01	0.99	0.38	49.41	0.49	46.78	1.19	NA	NA	49.41	0.49	NA
19AR16 Spot 90	355.54	11023.22	0.61	21.15	2.25	0.05	2.59	0.01	1.27	0.49	49.72	0.63	48.10	1.22	NA	NA	49.72	0.63	NA
19AR16 Spot 91	182.91	3168.73	0.53	22.07	2.76	0.04	3.28	0.01	1.36	0.41	48.55	0.66	41.67	1.34	NA	NA	48.55	0.66	NA
19AR16 Spot 93	201.09	5985.90	1.12	21.69	2.68	0.05	3.37	0.01	1.16	0.34	49.13	0.57	45.26	1.49	NA	NA	49.13	0.57	NA
19AR16 Spot 94	308.79	16069.24	0.85	21.23	1.81	0.05	2.12	0.01	1.10	0.52	49.60	0.55	48.30	1.00	NA	NA	49.60	0.55	NA
19AR16 Spot 95	226.20	4028.87	0.72	21.49	2.52	0.05	2.79	0.01	1.02	0.37	49.64	0.50	44.92	1.22	NA	NA	49.64	0.50	NA
19AR16 Spot 96	232.96	7112.42	0.85	21.44	2.18	0.05	2.43	0.01	1.03	0.43	49.05	0.50	46.14	1.10	NA	NA	49.05	0.50	NA
19AR16 Spot 98	1108.57	41904.76	0.90	21.10	1.02	0.05	1.62	0.01	1.22	0.75	51.18	0.62	50.73	0.80	29.28	25.81	51.18	0.62	174.81
19AR16 Spot 99	496.18	5060.61	0.33	15.78	4.99	0.07	5.17	0.01	1.33	0.26	50.84	0.68	64.35	3.22	600.93	108.15	50.84	0.68	8.46
19AR16 Spot 100	159.25	6033.62	0.60	20.11	3.53	0.05	3.95	0.01	1.66	0.42	49.06	0.81	48.88	1.89	40.22	NA	49.06	0.81	121.98

Table S2 (Continued). U/Pb igneous zircon geochronologic analyses by LA-ICP-MS

Analysis	Isotope Ratios										Apparent Ages (Ma)								
	U (ppm)	206Pb 204Pb	U/Th	206Pb* 207Pb*	± 1σ (%)	207Pb* 235U	± 1σ (%)	206Pb* 238U	± 1σ (%)	error corr.	206Pb* 238U	± 1σ (Ma)	207Pb* 235U	± 1σ (Ma)	206Pb* 207Pb*	± 1σ (Ma)	**Best Age (Ma)**	**± 1σ (Ma)**	% conc
Sample 19AR17: (Lat/Long: 29.729595, 86.308456)--NAD 1983 coordinate system																			
19AR17 Spot 101	173.36	9664.85	0.77	18.87	2.65	0.05	3.32	0.01	1.35	0.41	50.05	0.67	54.19	1.75	241.36	69.87	50.05	0.67	20.74
19AR17 Spot 102	141.37	26163.77	0.77	22.02	2.71	0.05	2.99	0.01	1.26	0.42	49.56	0.62	46.92	1.37	NA	NA	49.56	0.62	NA
19AR17 Spot 103	164.55	10629.91	1.21	22.66	2.84	0.05	3.21	0.01	1.33	0.41	49.86	0.66	45.02	1.42	NA	NA	49.86	0.66	NA
19AR17 Spot 104	201.01	3224.42	0.89	21.15	3.23	0.05	3.95	0.01	1.51	0.38	50.13	0.75	45.19	1.75	NA	NA	50.13	0.75	NA
19AR17 Spot 105	233.85	5422.42	0.95	20.63	2.96	0.05	3.33	0.01	1.30	0.39	49.86	0.65	48.13	1.57	NA	NA	49.86	0.65	NA
19AR17 Spot 106	186.21	8383.31	1.01	22.05	2.85	0.05	3.87	0.01	1.65	0.43	49.80	0.82	45.85	1.74	NA	NA	49.80	0.82	NA
19AR17 Spot 108	237.65	13062.48	1.02	20.10	2.57	0.06	3.03	0.01	1.58	0.52	56.04	0.88	57.30	1.69	110.21	61.11	56.04	0.88	50.85
19AR17 Spot 109	142.57	6162.33	1.22	22.09	2.92	0.05	4.21	0.01	1.10	0.26	51.81	0.57	46.90	1.93	NA	NA	51.81	0.57	NA
19AR17 Spot 110	216.37	17548.22	0.89	15.72	2.40	0.07	2.79	0.01	1.41	0.51	55.02	0.78	72.09	1.94	683.14	51.33	55.02	0.78	8.05
19AR17 Spot 112	349.11	20801.06	1.62	21.27	2.28	0.05	2.69	0.01	1.42	0.53	51.36	0.73	50.10	1.31	NA	NA	51.36	0.73	NA
19AR17 Spot 113	363.35	51324.95	0.92	21.19	2.33	0.05	2.90	0.01	1.74	0.60	52.12	0.90	51.46	1.46	20.95	NA	52.12	0.90	248.72
19AR17 Spot 114	209.47	5770.51	0.97	20.77	2.59	0.05	3.06	0.01	1.58	0.52	53.22	0.84	51.08	1.52	NA	NA	53.22	0.84	NA
19AR17 Spot 115	299.99	7158.92	1.69	20.18	2.13	0.07	2.75	0.01	1.42	0.52	71.71	1.01	71.11	1.89	51.03	NA	71.71	1.01	140.52
19AR17 Spot 116	562.39	112262.13	1.50	21.14	1.71	0.06	2.33	0.01	1.57	0.68	62.86	0.99	62.17	1.40	35.47	NA	62.86	0.99	177.21
19AR17 Spot 118	144.82	4540.89	1.03	23.02	2.92	0.04	3.26	0.01	1.33	0.41	49.81	0.66	42.31	1.35	NA	NA	49.81	0.66	NA
19AR17 Spot 119	224.09	60931.22	0.84	20.73	2.17	0.05	2.53	0.01	1.28	0.51	49.66	0.63	50.21	1.24	76.31	51.74	49.66	0.63	65.07
19AR17 Spot 120	294.28	76249.65	0.81	21.03	2.04	0.05	2.33	0.01	1.12	0.48	52.77	0.59	52.60	1.20	44.49	NA	52.77	0.59	118.63
19AR17 Spot 121	303.27	4434.37	0.67	11.86	2.10	0.09	2.56	0.01	1.45	0.56	51.89	0.75	87.06	2.13	1205.24	41.61	51.89	0.75	4.31
19AR17 Spot 122	184.59	3536.29	0.54	20.92	2.66	0.05	5.65	0.01	1.24	0.22	49.18	0.61	45.27	2.50	NA	NA	49.18	0.61	NA
19AR17 Spot 123	937.83	12983.17	1.47	21.10	1.38	0.05	1.80	0.01	1.15	0.64	53.83	0.62	52.39	0.92	NA	NA	53.83	0.62	NA
19AR17 Spot 124	705.25	10185.09	0.85	20.64	1.62	0.05	2.02	0.01	1.10	0.55	50.09	0.55	49.58	0.98	25.36	NA	50.09	0.55	197.49
19AR17 Spot 125	705.62	59674.70	1.21	21.31	1.75	0.05	2.29	0.01	1.48	0.65	55.26	0.81	54.25	1.21	9.72	NA	55.26	0.81	568.61
19AR17 Spot 126	113.24	3410.86	1.12	22.14	2.83	0.04	6.26	0.01	1.53	0.24	50.80	0.77	43.81	2.68	NA	NA	50.80	0.77	NA
19AR17 Spot 127	311.87	106372.77	0.62	20.69	2.17	0.05	2.38	0.01	0.99	0.41	49.47	0.49	50.22	1.17	86.43	51.48	49.47	0.49	57.23
19AR17 Spot 129	135.54	3617.96	1.10	21.12	2.83	0.05	3.60	0.01	1.25	0.35	49.97	0.62	45.62	1.61	NA	NA	49.97	0.62	NA
19AR17 Spot 130	237.09	3782.32	1.02	19.65	2.53	0.05	3.18	0.01	1.39	0.44	49.17	0.68	48.71	1.51	26.14	NA	49.17	0.68	188.14
19AR17 Spot 131	287.75	7239.10	0.69	16.04	5.91	0.06	6.16	0.01	1.66	0.27	50.12	0.83	63.30	3.78	595.33	128.66	50.12	0.83	8.42
19AR17 Spot 132	171.34	3703.08	1.22	19.24	2.84	0.05	4.42	0.01	1.55	0.35	49.00	0.76	49.55	2.14	76.09	NA	49.00	0.76	64.40
19AR17 Spot 133	468.39	17564.49	1.34	21.63	2.19	0.05	2.75	0.01	1.63	0.59	51.05	0.83	48.86	1.31	NA	NA	51.05	0.83	NA
19AR17 Spot 134	218.53	4375.95	0.65	20.96	2.21	0.05	2.52	0.01	1.17	0.46	49.79	0.58	46.57	1.15	NA	NA	49.79	0.58	NA
19AR17 Spot 135	164.39	3219.83	1.10	20.47	2.67	0.04	3.10	0.01	1.15	0.37	47.66	0.55	44.54	1.35	NA	NA	47.66	0.55	NA
19AR17 Spot 136	941.16	23900.91	1.75	21.02	1.56	0.05	2.06	0.01	1.23	0.60	50.44	0.62	49.89	1.00	23.49	NA	50.44	0.62	214.67
19AR17 Spot 137	261.29	36489.99	0.79	21.91	2.55	0.05	2.78	0.01	1.11	0.40	51.28	0.57	48.88	1.33	NA	NA	51.28	0.57	NA
19AR17 Spot 138	581.21	70134.79	0.63	9.62	10.40	0.12	10.49	0.01	1.39	0.13	53.68	0.74	113.67	11.28	1674.38	192.70	53.68	0.74	3.21
19AR17 Spot 140	288.72	10789.76	0.99	21.70	1.98	0.05	2.47	0.01	1.31	0.53	51.28	0.67	48.31	1.17	NA	NA	51.28	0.67	NA
19AR17 Spot 141	283.18	9610.75	0.70	21.26	2.04	0.05	2.44	0.01	1.25	0.51	49.27	0.61	47.22	1.13	NA	NA	49.27	0.61	NA
19AR17 Spot 142	259.65	7357.81	0.88	21.12	2.51	0.05	3.57	0.01	1.22	0.34	49.81	0.61	47.56	1.66	NA	NA	49.81	0.61	NA
19AR17 Spot 143	157.28	4575.02	0.70	21.38	3.00	0.05	3.44	0.01	1.28	0.37	49.74	0.63	45.65	1.53	NA	NA	49.74	0.63	NA
19AR17 Spot 144	143.86	3263.29	1.13	21.81	3.25	0.04	4.45	0.01	1.46	0.33	49.56	0.72	43.21	1.88	NA	NA	49.56	0.72	NA
19AR17 Spot 145	1240.09	57669.69	0.35	20.12	1.35	0.05	1.87	0.01	1.27	0.68	49.70	0.63	51.66	0.94	143.62	32.00	49.70	0.63	34.61
19AR17 Spot 146	146.62	3560.10	1.18	20.46	3.16	0.05	3.58	0.01	1.13	0.32	48.15	0.54	45.36	1.59	NA	NA	48.15	0.54	NA
19AR17 Spot 148	191.65	4792.31	1.00	19.71	3.24	0.05	4.45	0.01	1.21	0.27	50.72	0.61	50.79	2.20	54.12	NA	50.72	0.61	93.71
19AR17 Spot 149	284.92	19522.28	0.69	18.03	2.81	0.06	3.00	0.01	1.05	0.35	51.90	0.54	59.41	1.73	373.66	63.24	51.90	0.54	13.89
19AR17 Spot 150	330.00	16141.03	0.77	19.61	1.89	0.05	2.29	0.01	1.06	0.46	48.86	0.51	51.42	1.15	172.32	47.50	48.86	0.51	28.35

Table S2 (Continued). U/Pb igneous zircon geochronologic analyses by LA-ICP-MS

Analysis	Isotope Ratios										Apparent Ages (Ma)								
	U (ppm)	206Pb 204Pb	U/Th	206Pb* 207Pb*	± 1σ (%)	207Pb* 235U	± 1σ (%)	206Pb* 238U	± 1σ (%)	error corr.	206Pb* 238U	± 1σ (Ma)	207Pb* 235U	± 1σ (Ma)	206Pb* 207Pb*	± 1σ (Ma)	**Best Age (Ma)**	**± 1σ (Ma)**	% conc
Sample 19AR18: (Lat/Long: 29.721146, 86.304421)--NAD 1983 coordinate system																			
19AR18 Spot 1	331.36	7053.70	0.96	22.09	2.47	0.05	3.70	0.01	1.29	0.35	50.49	0.65	46.12	1.67	NA	NA	50.49	0.65	NA
19AR18 Spot 2	567.74	28532.99	2.18	19.46	1.05	0.17	1.69	0.02	1.32	0.78	155.81	2.03	159.76	2.49	218.76	24.37	155.81	2.03	71.22
19AR18 Spot 3	265.43	9451.73	0.88	22.00	2.72	0.05	2.94	0.01	1.04	0.35	49.14	0.51	45.65	1.31	NA	NA	49.14	0.51	NA
19AR18 Spot 4	463.04	82593.07	1.45	20.31	1.63	0.06	2.07	0.01	1.27	0.61	52.80	0.67	54.60	1.10	134.17	38.41	52.80	0.67	39.35
19AR18 Spot 5	170.30	10729.45	1.16	21.22	3.22	0.05	3.41	0.01	1.12	0.33	49.62	0.55	48.00	1.60	NA	NA	49.62	0.55	NA
19AR18 Spot 6	325.04	5850.93	0.92	21.08	2.43	0.05	3.89	0.01	1.12	0.29	48.03	0.53	45.59	1.73	NA	NA	48.03	0.53	NA
19AR18 Spot 7	242.02	27302.44	0.86	21.71	2.19	0.05	2.59	0.01	1.38	0.53	52.73	0.72	50.53	1.28	NA	NA	52.73	0.72	NA
19AR18 Spot 8	610.48	35009.15	1.36	20.73	1.65	0.05	2.10	0.01	1.28	0.61	50.22	0.64	50.53	1.04	65.40	39.66	50.22	0.64	76.79
19AR18 Spot 9	112.87	7564.72	1.01	20.30	3.85	0.05	4.13	0.01	1.50	0.36	50.27	0.75	50.05	2.02	39.94	NA	50.27	0.75	125.85
19AR18 Spot 10	213.22	9774.78	0.79	22.35	2.85	0.04	3.04	0.01	1.00	0.33	48.02	0.48	43.81	1.30	NA	NA	48.02	0.48	NA
19AR18 Spot 11	392.59	8439.10	1.11	21.24	2.16	0.05	2.92	0.01	1.27	0.43	49.68	0.63	47.50	1.36	NA	NA	49.68	0.63	NA
19AR18 Spot 12	337.07	91699.25	1.33	21.32	1.98	0.05	2.17	0.01	0.90	0.41	50.85	0.45	50.08	1.06	13.46	NA	50.85	0.45	377.77
19AR18 Spot 13	200.14	15084.68	1.16	20.47	2.83	0.05	3.08	0.01	1.21	0.39	49.63	0.60	50.07	1.50	71.05	67.32	49.63	0.60	69.86
19AR18 Spot 14	471.39	101096.03	0.66	20.83	1.71	0.05	2.06	0.01	1.14	0.55	49.32	0.56	49.75	1.00	70.46	40.73	49.32	0.56	69.99
19AR18 Spot 15	811.82	27222.91	1.48	20.92	1.56	0.06	1.91	0.01	1.10	0.58	58.50	0.64	58.04	1.08	39.45	37.36	58.50	0.64	148.29
19AR18 Spot 16	161.14	11994.79	1.01	19.90	3.78	0.05	4.07	0.01	1.41	0.35	50.18	0.71	51.80	2.06	127.43	89.89	50.18	0.71	39.38
19AR18 Spot 17	389.18	6147.76	0.82	20.94	1.88	0.05	3.39	0.01	0.94	0.28	49.98	0.47	47.80	1.58	NA	NA	49.98	0.47	NA
19AR18 Spot 18	326.55	6653.32	0.61	18.84	3.11	0.05	3.47	0.01	1.40	0.40	49.10	0.68	52.55	1.77	212.92	73.47	49.10	0.68	23.06
19AR18 Spot 19	269.21	8830.03	0.85	21.14	2.73	0.05	3.03	0.01	1.27	0.42	53.55	0.67	51.46	1.52	NA	NA	53.55	0.67	NA
19AR18 Spot 20	827.94	77707.60	1.11	20.80	1.53	0.05	1.89	0.01	1.11	0.59	48.62	0.54	49.08	0.90	71.93	36.37	48.62	0.54	67.59
19AR18 Spot 21	288.20	5835.08	0.77	21.85	1.84	0.05	2.11	0.01	1.02	0.48	49.09	0.50	44.83	0.92	NA	NA	49.09	0.50	NA
19AR18 Spot 22	203.52	8152.42	0.71	19.38	3.06	0.05	3.23	0.01	0.94	0.29	50.02	0.47	52.42	1.65	163.71	72.17	50.02	0.47	30.55
19AR18 Spot 23	182.04	3582.83	0.58	20.75	3.03	0.05	3.68	0.01	1.33	0.36	48.97	0.65	45.55	1.64	NA	NA	48.97	0.65	NA
19AR18 Spot 24	189.40	3979.48	1.05	17.12	6.14	0.06	6.41	0.01	1.42	0.22	51.58	0.73	59.22	3.69	380.12	140.71	51.58	0.73	13.57
19AR18 Spot 25	402.28	5362.02	0.96	20.84	1.56	0.05	1.91	0.01	1.07	0.56	49.90	0.53	47.59	0.89	NA	NA	49.90	0.53	NA
19AR18 Spot 26	249.06	34394.16	0.82	21.41	2.14	0.05	2.40	0.01	1.08	0.45	48.39	0.52	47.20	1.10	NA	NA	48.39	0.52	NA
19AR18 Spot 27	140.85	29240.13	0.97	20.74	3.52	0.05	3.77	0.01	1.35	0.36	49.80	0.67	50.01	1.84	60.03	NA	49.80	0.67	82.96
19AR18 Spot 28	181.60	3649.45	1.01	20.71	2.69	0.05	4.50	0.01	1.32	0.29	48.61	0.64	45.35	2.00	NA	NA	48.61	0.64	NA
19AR18 Spot 29	308.97	5512.14	0.80	21.52	2.30	0.05	2.68	0.01	1.19	0.44	49.55	0.59	45.76	1.20	NA	NA	49.55	0.59	NA
19AR18 Spot 30	112.93	4092.81	0.71	20.37	3.61	0.05	4.00	0.01	1.38	0.34	48.49	0.66	46.47	1.82	NA	NA	48.49	0.66	NA
19AR18 Spot 32	185.22	9805.52	0.97	21.35	2.14	0.05	2.46	0.01	1.20	0.49	49.64	0.59	47.36	1.14	NA	NA	49.64	0.59	NA
19AR18 Spot 33	252.75	59742.88	1.25	20.79	1.78	0.05	2.16	0.01	1.21	0.56	49.51	0.60	49.79	1.05	63.10	42.49	49.51	0.60	78.46
19AR18 Spot 34	157.91	5662.05	0.77	19.87	3.57	0.05	3.95	0.01	1.29	0.33	48.30	0.62	48.47	1.87	57.14	NA	48.30	0.62	84.53
19AR18 Spot 35	220.65	18858.52	1.91	20.48	2.51	0.07	2.88	0.01	1.25	0.43	66.08	0.82	66.27	1.85	73.25	61.75	66.08	0.82	90.21
19AR18 Spot 36	333.42	47913.82	0.99	21.21	2.07	0.05	2.46	0.01	1.34	0.54	53.25	0.71	52.37	1.26	12.45	NA	53.25	0.71	427.78
19AR18 Spot 37	199.74	3892.86	0.96	20.88	2.80	0.05	5.27	0.01	1.06	0.20	49.79	0.53	46.23	2.38	NA	NA	49.79	0.53	NA
19AR18 Spot 38	490.58	7688.29	2.01	21.87	1.57	0.05	2.03	0.01	0.99	0.49	54.52	0.54	50.23	1.00	NA	NA	54.52	0.54	NA
19AR18 Spot 39	567.77	13365.55	0.87	21.11	1.56	0.05	1.91	0.01	0.96	0.50	54.42	0.52	52.87	0.98	NA	NA	54.42	0.52	NA
19AR18 Spot 40	210.65	7210.52	0.78	21.12	2.74	0.05	3.22	0.01	1.22	0.38	49.01	0.60	46.75	1.47	NA	NA	49.01	0.60	NA
19AR18 Spot 41	277.92	29231.78	0.74	20.72	2.95	0.05	3.08	0.01	0.87	0.28	48.86	0.42	49.06	1.47	58.58	NA	48.86	0.42	83.41
19AR18 Spot 42	283.79	24035.07	0.77	20.54	2.21	0.05	2.75	0.01	1.64	0.59	50.86	0.83	51.34	1.38	74.11	52.70	50.86	0.83	68.62
19AR18 Spot 43	103.92	14459.87	0.88	21.54	4.20	0.05	4.45	0.01	1.46	0.33	50.18	0.73	47.92	2.08	NA	NA	50.18	0.73	NA
19AR18 Spot 45	152.68	6548.73	1.01	15.94	3.04	0.06	3.58	0.01	1.33	0.37	49.46	0.65	62.51	2.17	596.16	72.04	49.46	0.65	8.30
19AR18 Spot 46	170.05	6156.42	0.95	19.95	3.16	0.05	3.55	0.01	1.02	0.29	48.22	0.49	48.33	1.67	53.83	NA	48.22	0.49	89.58
19AR18 Spot 48	119.11	4334.56	0.62	20.27	3.26	0.05	5.17	0.01	1.49	0.29	50.20	0.74	48.41	2.44	NA	NA	50.20	0.74	NA
19AR18 Spot 49	214.89	8981.27	1.40	19.83	2.28	0.05	3.16	0.01	1.40	0.44	51.10	0.71	52.27	1.61	106.32	66.88	51.10	0.71	48.06
19AR18 Spot 50	636.56	31860.72	1.20	19.80	2.16	0.06	2.45	0.01	1.14	0.47	52.75	0.60	55.26	1.32	165.57	50.67	52.75	0.60	31.86

Table S2 (Continued). U/Pb igneous zircon geochronologic analyses by LA-ICP-MS

Analysis	Isotope Ratios										Apparent Ages (Ma)								
	U (ppm)	206Pb 204Pb	U/Th	206Pb* 207Pb*	± 1σ (%)	207Pb* 235U	± 1σ (%)	206Pb* 238U	± 1σ (%)	error corr.	206Pb* 238U	± 1σ (Ma)	207Pb* 235U	± 1σ (Ma)	206Pb* 207Pb*	± 1σ (Ma)	**Best Age (Ma)**	**± 1σ (Ma)**	% conc
Sample 19AR24: (Lat/Long: 30.161614, 86.323944)--NAD 1983 coordinate system																			
19AR24 Spot 51	139.68	4502.10	1.76	22.16	2.33	0.05	3.76	0.01	1.45	0.39	60.51	0.87	53.77	1.97	NA	NA	60.51	0.87	NA
19AR24 Spot 52	367.96	9232.78	2.60	20.42	1.74	0.06	2.65	0.01	1.66	0.63	58.74	0.97	58.91	1.52	65.83	49.07	58.74	0.97	89.24
19AR24 Spot 53	250.28	26365.82	2.06	20.93	1.74	0.06	2.30	0.01	1.45	0.63	59.01	0.85	58.92	1.32	55.62	42.64	59.01	0.85	106.09
19AR24 Spot 54	252.65	9404.09	1.47	21.61	2.18	0.05	2.72	0.01	1.54	0.57	57.22	0.88	54.21	1.43	NA	NA	57.22	0.88	NA
19AR24 Spot 55	276.14	21344.67	2.51	21.09	1.78	0.06	2.18	0.01	1.25	0.58	63.69	0.80	62.84	1.33	30.57	NA	63.69	0.80	208.35
19AR24 Spot 56	350.58	30663.07	1.65	21.25	1.71	0.06	2.03	0.01	0.97	0.48	58.02	0.56	57.20	1.13	23.09	NA	58.02	0.56	251.23
19AR24 Spot 57	653.21	32079.54	2.64	20.41	1.64	0.07	2.06	0.01	1.18	0.57	63.34	0.74	64.84	1.30	120.51	39.97	63.34	0.74	52.56
19AR24 Spot 58	411.12	30582.92	2.07	21.41	1.80	0.06	2.29	0.01	1.39	0.61	60.05	0.83	58.64	1.30	1.51	NA	60.05	0.83	3980.93
19AR24 Spot 59	268.79	20042.78	2.78	20.99	1.34	0.06	1.82	0.01	1.22	0.67	58.07	0.71	57.56	1.02	36.22	32.31	58.07	0.71	160.32
19AR24 Spot 60	320.00	108045.44	1.78	20.79	2.17	0.06	2.50	0.01	1.25	0.50	58.56	0.73	59.33	1.44	90.49	51.31	58.56	0.73	64.72
19AR24 Spot 61	335.24	26505.84	1.93	21.22	1.45	0.06	2.01	0.01	1.36	0.68	57.54	0.78	56.66	1.11	19.43	NA	57.54	0.78	296.20
19AR24 Spot 62	149.74	11460.05	2.45	15.26	4.91	0.21	6.15	0.02	3.68	0.60	153.11	5.57	195.43	10.93	743.00	104.07	153.11	5.57	20.61
19AR24 Spot 63	889.96	50042.16	1.66	19.35	1.32	0.07	1.93	0.01	1.40	0.73	63.04	0.88	68.13	1.27	250.49	30.52	63.04	0.88	25.17
19AR24 Spot 64	165.39	23972.82	2.07	19.78	2.23	0.06	2.65	0.01	1.43	0.54	58.56	0.83	61.67	1.59	184.08	52.09	58.56	0.83	31.81
19AR24 Spot 65	288.16	4341.05	1.36	21.03	2.04	0.06	2.56	0.01	1.54	0.60	58.45	0.90	54.60	1.36	NA	NA	58.45	0.90	NA
19AR24 Spot 66	170.46	17788.45	2.02	20.35	1.94	0.06	2.54	0.01	1.39	0.55	59.47	0.83	60.55	1.49	103.36	50.09	59.47	0.83	57.54
19AR24 Spot 67	281.53	28282.30	2.38	17.59	1.97	0.07	2.34	0.01	1.24	0.53	58.95	0.73	69.69	1.58	455.62	44.17	58.95	0.73	12.94
19AR24 Spot 68	277.12	55877.03	1.97	20.84	1.34	0.06	1.81	0.01	1.20	0.66	58.94	0.71	59.33	1.04	75.30	32.21	58.94	0.71	78.26
19AR24 Spot 69	249.05	19137.48	2.56	20.78	1.64	0.06	2.17	0.01	1.38	0.63	58.95	0.81	58.89	1.24	56.54	40.06	58.95	0.81	104.26
19AR24 Spot 70	171.87	5852.63	0.56	13.57	3.35	0.09	3.91	0.01	1.06	0.27	58.77	0.62	87.08	3.26	954.98	77.00	58.77	0.62	6.15
19AR24 Spot 71	405.33	38127.68	1.89	20.10	1.66	0.07	2.45	0.01	1.79	0.73	63.65	1.13	66.07	1.57	154.41	39.09	63.65	1.13	41.22
19AR24 Spot 72	340.17	11078.96	1.71	20.66	1.73	0.06	1.98	0.01	0.97	0.49	59.33	0.57	58.89	1.13	41.03	41.36	59.33	0.57	144.61
19AR24 Spot 73	327.30	11098.94	1.44	14.46	6.58	0.08	6.71	0.01	1.26	0.19	58.54	0.73	82.74	5.33	853.31	137.09	58.54	0.73	6.86
19AR24 Spot 74	204.90	22564.37	1.94	20.27	1.93	0.06	2.49	0.01	1.56	0.63	57.70	0.90	59.20	1.43	120.11	45.66	57.70	0.90	48.04
19AR24 Spot 75	186.40	10690.25	1.37	21.87	2.07	0.06	2.39	0.01	1.13	0.47	58.56	0.66	54.86	1.28	NA	NA	58.56	0.66	NA
19AR24 Spot 76	327.37	54546.91	1.81	21.13	1.81	0.06	2.10	0.01	1.06	0.51	58.95	0.62	58.49	1.19	39.60	NA	58.95	0.62	148.86
19AR24 Spot 77	507.33	38903.42	1.76	21.12	1.78	0.06	2.32	0.01	1.47	0.63	57.66	0.84	57.16	1.29	35.88	NA	57.66	0.84	160.70
19AR24 Spot 78	431.23	26254.94	1.55	21.10	1.73	0.06	2.15	0.01	1.25	0.58	61.54	0.77	60.73	1.27	28.72	NA	61.54	0.77	214.31
19AR24 Spot 79	561.94	69053.70	1.73	21.43	1.48	0.06	2.15	0.01	1.55	0.72	58.82	0.91	57.64	1.20	8.83	NA	58.82	0.91	666.02
19AR24 Spot 81	138.41	39241.51	1.27	21.78	3.08	0.06	3.31	0.01	1.23	0.37	59.43	0.73	57.05	1.84	NA	NA	59.43	0.73	NA
19AR24 Spot 82	1400.66	30129.15	2.06	20.83	1.06	0.06	1.66	0.01	1.28	0.77	56.00	0.71	56.12	0.91	61.10	25.26	56.00	0.71	91.66
19AR24 Spot 83	325.06	32595.83	2.16	20.56	1.82	0.06	2.10	0.01	1.04	0.50	59.11	0.61	59.96	1.22	94.00	43.04	59.11	0.61	62.89
19AR24 Spot 84	158.99	49876.76	1.52	20.42	2.25	0.06	2.61	0.01	1.31	0.50	59.39	0.77	60.86	1.54	118.72	53.11	59.39	0.77	50.03
19AR24 Spot 85	261.33	25180.86	2.35	21.14	1.61	0.06	2.27	0.01	1.46	0.65	58.67	0.85	57.78	1.27	21.05	NA	58.67	0.85	278.69
19AR24 Spot 86	188.87	46461.96	1.42	21.38	1.99	0.06	2.26	0.01	1.07	0.47	59.20	0.63	57.98	1.28	8.19	NA	59.20	0.63	722.77
19AR24 Spot 87	896.89	357737.95	2.06	20.12	1.90	0.06	2.45	0.01	1.55	0.63	57.70	0.89	60.37	1.44	167.72	44.39	57.70	0.89	34.40
19AR24 Spot 88	419.34	32507.24	2.29	20.98	1.51	0.06	2.12	0.01	1.45	0.68	59.76	0.86	59.48	1.22	48.13	36.98	59.76	0.86	124.15
19AR24 Spot 89	164.60	196882.70	2.46	19.29	2.29	0.07	2.88	0.01	1.73	0.60	63.16	1.09	68.64	1.91	264.33	52.67	63.16	1.09	23.89
19AR24 Spot 90	260.12	17226.93	2.54	21.74	2.08	0.06	2.33	0.01	1.04	0.45	58.09	0.60	55.38	1.25	NA	NA	58.09	0.60	NA
19AR24 Spot 91	145.21	10961.16	3.10	19.85	2.52	0.06	2.84	0.01	1.32	0.46	57.69	0.76	59.53	1.64	134.24	59.25	57.69	0.76	42.97
19AR24 Spot 92	292.61	13203.78	2.11	21.98	1.54	0.06	2.15	0.01	1.24	0.58	59.50	0.74	55.69	1.16	NA	NA	59.50	0.74	NA
19AR24 Spot 93	251.55	49058.54	1.23	21.24	1.66	0.06	2.12	0.01	1.31	0.62	57.67	0.75	56.85	1.17	22.69	NA	57.67	0.75	254.16
19AR24 Spot 94	168.55	10537.41	1.47	20.40	1.95	0.06	2.82	0.01	1.92	0.68	58.14	1.11	58.32	1.60	65.72	49.09	58.14	1.11	88.46
19AR24 Spot 95	370.55	14819.34	1.35	20.78	1.55	0.06	2.03	0.01	1.22	0.60	58.78	0.72	58.36	1.15	41.23	38.60	58.78	0.72	142.56
19AR24 Spot 96	229.00	68802.31	3.38	20.04	1.53	0.07	2.17	0.01	1.55	0.71	65.01	1.00	67.71	1.42	164.05	35.67	65.01	1.00	39.63
19AR24 Spot 97	310.15	378141.76	2.13	20.62	1.86	0.06	2.04	0.01	0.82	0.40	58.19	0.48	59.31	1.17	104.77	44.03	58.19	0.48	55.54
19AR24 Spot 98	349.20	7263.51	1.49	21.23	1.35	0.06	1.85	0.01	1.27	0.69	60.56	0.77	57.47	1.04	NA	NA	60.56	0.77	NA
19AR24 Spot 99	225.94	8491.97	2.11	21.08	1.64	0.06	2.33	0.01	1.25	0.54	59.45	0.74	57.19	1.30	NA	NA	59.45	0.74	NA
19AR24 Spot 100	335.23	13985.15	1.02	18.26	1.63	0.07	2.17	0.01	1.42	0.66	57.35	0.81	64.63	1.36	343.54	37.00	57.35	0.81	16.69

Table S2 (Continued). U/Pb igneous zircon geochronologic analyses by LA-ICP-MS

Analysis	Isotope Ratios										Apparent Ages (Ma)								
	U (ppm)	206Pb 204Pb	U/Th	206Pb* 207Pb*	± 1σ (%)	207Pb* 235U	± 1σ (%)	206Pb* 238U	± 1σ (%)	error corr.	206Pb* 238U	± 1σ (Ma)	207Pb* 235U	± 1σ (Ma)	206Pb* 207Pb*	± 1σ (Ma)	**Best Age (Ma)**	**± 1σ (Ma)**	% conc
Sample 19AR25: (Lat/Long: 29.958542, 86.467537)--NAD 1983 coordinate system																			
19AR25 Spot 2	862.24	5994.22	1.10	21.45	2.17	0.01	2.55	0.00	1.28	0.50	10.93	0.14	10.40	0.26	NA	NA	10.93	0.14	NA
19AR25 Spot 3	751.89	7220.35	1.04	19.52	3.10	0.01	3.47	0.00	1.53	0.44	10.71	0.16	11.36	0.39	150.16	73.05	10.71	0.16	7.13
19AR25 Spot 6	406.38	22246.45	0.68	23.82	3.45	0.01	3.77	0.00	1.51	0.40	10.54	0.16	9.37	0.35	NA	NA	10.54	0.16	NA
19AR25 Spot 10	750.77	6381.79	1.05	20.54	2.81	0.01	3.96	0.00	1.25	0.32	10.89	0.14	10.84	0.43	-0.54	NA	10.89	0.14	-1999.84
19AR25 Spot 11	414.39	9007.49	0.81	17.14	3.66	0.01	4.06	0.00	1.67	0.41	10.81	0.18	13.12	0.53	460.77	82.04	10.81	0.18	2.35
19AR25 Spot 12	2444.30	45127.48	0.52	21.12	1.49	0.01	1.84	0.00	1.07	0.58	10.70	0.11	10.78	0.20	28.81	NA	10.70	0.11	37.14
19AR25 Spot 13	625.62	11561.48	2.38	17.70	4.63	0.01	4.86	0.00	1.43	0.29	11.07	0.16	13.09	0.63	402.02	104.11	11.07	0.16	2.75
19AR25 Spot 14	780.51	146789.60	0.99	19.75	3.24	0.01	3.59	0.00	1.53	0.43	10.79	0.17	11.68	0.42	198.89	75.32	10.79	0.17	5.43
19AR25 Spot 15	1217.86	31342.56	1.53	20.86	2.27	0.01	2.66	0.00	1.39	0.52	11.11	0.15	11.30	0.30	51.38	NA	11.11	0.15	21.63
19AR25 Spot 16	296.61	3943.54	0.74	19.61	4.37	0.01	4.80	0.00	1.83	0.38	10.74	0.20	10.88	0.52	42.01	NA	10.74	0.20	25.56
19AR25 Spot 18	537.07	20588.12	0.99	21.21	2.59	0.01	3.01	0.00	1.33	0.44	11.01	0.15	10.97	0.33	0.88	NA	11.01	0.15	1249.48
19AR25 Spot 20	907.46	9162.50	1.34	21.41	2.72	0.01	3.52	0.00	1.33	0.38	10.71	0.14	10.36	0.36	NA	NA	10.71	0.14	NA
19AR25 Spot 21	867.54	6167.51	0.93	20.73	3.18	0.01	3.50	0.00	1.36	0.39	10.92	0.15	10.73	0.37	NA	NA	10.92	0.15	NA
19AR25 Spot 22	1655.58	28915.06	0.98	20.43	2.01	0.01	2.29	0.00	1.09	0.48	10.89	0.12	11.31	0.26	101.62	47.63	10.89	0.12	10.71
19AR25 Spot 23	1358.87	4055.28	1.10	8.32	16.43	0.03	17.20	0.00	4.90	0.28	11.83	0.58	29.37	4.98	1893.56	298.75	11.83	0.58	0.62
19AR25 Spot 25	827.49	5354.70	1.34	17.04	3.41	0.01	4.11	0.00	1.83	0.44	11.96	0.22	14.32	0.58	431.96	82.01	11.96	0.22	2.77
19AR25 Spot 27	1053.73	6583.56	0.67	21.38	2.56	0.01	3.13	0.00	1.31	0.42	10.57	0.14	10.09	0.31	NA	NA	10.57	0.14	NA
19AR25 Spot 28	679.29	47006.20	0.90	20.87	2.82	0.01	3.20	0.00	1.52	0.47	10.71	0.16	10.93	0.35	60.49	NA	10.71	0.16	17.70
19AR25 Spot 30	822.02	9526.20	1.65	21.30	2.75	0.01	3.33	0.00	1.64	0.49	10.80	0.18	10.52	0.35	NA	NA	10.80	0.18	NA
19AR25 Spot 31	546.70	123311.61	0.70	22.21	3.31	0.01	3.65	0.00	1.55	0.42	10.99	0.17	10.58	0.38	NA	NA	10.99	0.17	NA
19AR25 Spot 32	954.05	21072.42	1.42	20.98	2.15	0.01	2.54	0.00	1.22	0.48	10.95	0.13	11.02	0.28	27.30	NA	10.95	0.13	40.10
19AR25 Spot 33	897.33	5336.61	0.76	20.85	2.29	0.01	2.61	0.00	1.11	0.43	10.83	0.12	10.49	0.27	NA	NA	10.83	0.12	NA
19AR25 Spot 34	682.88	14828.91	0.85	23.05	3.47	0.01	3.79	0.00	1.49	0.39	10.84	0.16	9.85	0.37	NA	NA	10.84	0.16	NA
19AR25 Spot 35	619.16	3671.14	1.05	23.51	2.71	0.01	3.31	0.00	1.31	0.40	10.77	0.14	8.89	0.29	NA	NA	10.77	0.14	NA
19AR25 Spot 36	618.24	5459.59	0.72	21.17	3.73	0.01	4.19	0.00	1.77	0.42	10.72	0.19	10.22	0.43	NA	NA	10.72	0.19	NA
19AR25 Spot 37	1009.62	58171.50	0.97	21.97	2.47	0.01	2.83	0.00	1.38	0.49	10.76	0.15	10.42	0.29	NA	NA	10.76	0.15	NA
19AR25 Spot 38	611.52	11920.47	1.58	21.86	3.13	0.01	3.61	0.00	1.78	0.49	11.78	0.21	11.23	0.40	NA	NA	11.78	0.21	NA
19AR25 Spot 39	706.65	12923.88	1.25	21.13	3.11	0.01	3.37	0.00	1.29	0.38	11.02	0.14	10.90	0.37	NA	NA	11.02	0.14	NA
19AR25 Spot 41	383.77	656939.98	1.43	15.44	0.75	1.02	1.05	0.12	0.74	0.70	706.29	4.92	715.77	5.41	745.58	15.92	706.29	4.92	94.73
19AR25 Spot 43	587.83	9325.53	0.64	20.86	2.79	0.01	3.26	0.00	1.55	0.48	10.69	0.17	10.60	0.34	NA	NA	10.69	0.17	NA
19AR25 Spot 45	1093.28	6816.68	1.64	22.23	1.97	0.01	2.38	0.00	0.96	0.40	10.73	0.10	9.83	0.23	NA	NA	10.73	0.10	NA
19AR25 Spot 46	2077.96	41041.79	0.77	20.76	2.25	0.01	2.72	0.00	1.52	0.56	10.79	0.16	11.06	0.30	69.42	53.67	10.79	0.16	15.54
19AR25 Spot 48	442.96	7044.15	1.06	19.49	3.76	0.01	3.98	0.00	1.28	0.32	10.99	0.14	11.59	0.46	137.95	88.63	10.99	0.14	7.97
19AR25 Spot 49	897.85	106317.09	1.32	21.35	2.23	0.01	2.52	0.00	1.16	0.46	11.09	0.13	11.10	0.28	12.88	NA	11.09	0.13	86.10
19AR25 Spot 50	633.55	13191.07	0.89	23.09	3.08	0.01	3.38	0.00	1.38	0.41	10.80	0.15	9.77	0.33	NA	NA	10.80	0.15	NA

Table S2 (Continued). U/Pb igneous zircon geochronologic analyses by LA-ICP-MS

Analysis	Isotope Ratios										Apparent Ages (Ma)								
	U	206Pb	U/Th	206Pb*	± 1σ	207Pb*	± 1σ	206Pb*	± 1σ	error	206Pb*	± 1σ	207Pb*	± 1σ	206Pb*	± 1σ	**Best Age**	**± 1σ**	% conc
	(ppm)	204Pb		207Pb*	(%)	235U	(%)	238U	(%)	corr.	238U	(Ma)	235U	(Ma)	207Pb*	(Ma)	**(Ma)**	**(Ma)**	
Sample 19AR26: (Lat/Long: 29.96012, 86.4697)–NAD 1983 coordinate system																			
19AR26 Spot 52	211.46	25337.46	1.84	20.95	2.41	0.06	2.70	0.01	1.19	0.44	58.45	0.70	57.95	1.52	37.47	NA	58.45	0.70	155.97
19AR26 Spot 53	1198.98	7186.93	0.35	20.73	2.23	0.01	2.73	0.00	1.40	0.51	11.04	0.15	10.94	0.30	NA	NA	11.04	0.15	NA
19AR26 Spot 54	1729.01	8658.56	0.50	21.80	1.67	0.01	2.84	0.00	1.22	0.43	11.17	0.14	10.58	0.30	NA	NA	11.17	0.14	NA
19AR26 Spot 55	2357.38	22106.19	0.40	22.10	1.47	0.01	2.11	0.00	1.46	0.69	11.03	0.16	10.55	0.22	NA	NA	11.03	0.16	NA
19AR26 Spot 56	456.61	41746.17	1.87	20.26	1.98	0.06	2.27	0.01	1.06	0.46	53.57	0.56	55.26	1.22	129.54	47.30	53.57	0.56	41.35
19AR26 Spot 57	2197.43	20963.21	0.38	21.61	2.04	0.01	2.52	0.00	1.47	0.58	11.32	0.17	11.06	0.28	NA	NA	11.32	0.17	NA
19AR26 Spot 58	379.88	8273.17	0.58	18.61	4.31	0.01	4.72	0.00	1.90	0.40	11.43	0.22	12.72	0.60	263.89	99.19	11.43	0.22	4.33
19AR26 Spot 59	753.71	56889.94	0.45	19.75	3.24	0.01	3.55	0.00	1.44	0.41	10.86	0.16	11.72	0.41	192.24	75.45	10.86	0.16	5.65
19AR26 Spot 60	836.35	6450.79	0.45	21.78	3.29	0.01	4.40	0.00	1.25	0.28	11.04	0.14	10.33	0.45	NA	NA	11.04	0.14	NA
19AR26 Spot 61	1384.79	5462.95	2.94	21.04	2.03	0.01	3.22	0.00	1.20	0.37	11.15	0.13	10.70	0.34	NA	NA	11.15	0.13	NA
19AR26 Spot 63	941.46	5961.12	0.36	21.68	1.81	0.01	2.43	0.00	1.40	0.58	11.16	0.16	10.45	0.25	NA	NA	11.16	0.16	NA
19AR26 Spot 64	3630.07	6894.04	0.27	22.10	1.45	0.01	2.52	0.00	2.06	0.82	10.98	0.23	10.14	0.25	NA	NA	10.98	0.23	NA
19AR26 Spot 65	3113.05	45846.04	0.23	21.06	1.48	0.01	1.80	0.00	1.02	0.57	11.03	0.11	11.15	0.20	37.19	35.47	11.03	0.11	29.65
19AR26 Spot 66	4821.85	75472.38	1.92	21.02	1.31	0.01	1.81	0.00	1.25	0.69	11.43	0.14	11.61	0.21	48.23	31.35	11.43	0.14	23.70
19AR26 Spot 67	5551.34	15583.21	1.78	21.41	1.18	0.01	1.66	0.00	1.17	0.70	11.04	0.13	10.83	0.18	NA	NA	11.04	0.13	NA
19AR26 Spot 68	1118.83	10371.38	0.43	20.68	2.04	0.01	2.56	0.00	1.49	0.58	10.81	0.16	10.88	0.28	25.69	NA	10.81	0.16	42.09
19AR26 Spot 70	2494.11	17612.31	0.30	21.31	1.35	0.01	1.97	0.00	1.24	0.63	11.04	0.14	10.91	0.21	NA	NA	11.04	0.14	NA
19AR26 Spot 71	914.67	6481.00	1.59	20.72	2.39	0.01	3.86	0.00	1.72	0.45	11.19	0.19	11.03	0.42	NA	NA	11.19	0.19	NA
19AR26 Spot 72	587.57	6021.88	0.44	20.65	3.35	0.01	3.96	0.00	2.02	0.51	10.99	0.22	10.82	0.43	NA	NA	10.99	0.22	NA
19AR26 Spot 73	2736.75	11950.10	0.30	21.16	1.64	0.01	2.13	0.00	1.25	0.59	11.17	0.14	11.02	0.23	NA	NA	11.17	0.14	NA
19AR26 Spot 74	1779.95	18437.88	0.49	20.69	1.73	0.01	2.37	0.00	1.38	0.58	11.44	0.16	11.64	0.27	54.76	45.85	11.44	0.16	20.88
19AR26 Spot 75	593.50	13741.25	0.57	19.22	3.48	0.01	3.75	0.00	1.40	0.37	10.92	0.15	11.92	0.44	217.87	80.56	10.92	0.15	5.01
19AR26 Spot 76	1938.25	16561.47	2.46	20.96	2.10	0.01	2.69	0.00	1.63	0.61	11.08	0.18	11.11	0.30	18.22	NA	11.08	0.18	60.79
19AR26 Spot 77	2564.26	80298.38	1.99	21.11	1.03	0.05	1.80	0.01	1.47	0.82	52.69	0.77	52.34	0.92	36.11	24.80	52.69	0.77	145.90
19AR26 Spot 78	250.64	13379.57	1.68	21.57	1.81	0.05	2.24	0.01	1.31	0.59	54.40	0.71	51.85	1.13	NA	NA	54.40	0.71	NA
19AR26 Spot 79	574.21	3876.45	0.65	20.63	3.35	0.01	5.81	0.00	2.02	0.35	10.98	0.22	10.50	0.61	NA	NA	10.98	0.22	NA
19AR26 Spot 80	1466.82	8505.95	1.17	20.50	1.99	0.01	2.83	0.00	1.30	0.46	10.90	0.14	10.99	0.31	29.77	NA	10.90	0.14	36.62
19AR26 Spot 81	1947.74	150515.41	0.76	21.41	1.08	0.05	1.71	0.01	1.33	0.77	51.64	0.68	50.62	0.85	2.48	NA	51.64	0.68	2082.87
19AR26 Spot 83	1940.91	55941.30	1.18	21.15	1.64	0.01	2.14	0.00	1.37	0.64	11.40	0.16	11.45	0.24	23.31	NA	11.40	0.16	48.90
19AR26 Spot 84	2315.19	17880.07	0.24	16.57	2.04	0.01	2.40	0.00	1.04	0.44	11.09	0.12	14.09	0.34	562.22	46.97	11.09	0.12	1.97
19AR26 Spot 85	660.61	6044.07	0.45	21.32	2.98	0.01	3.94	0.00	1.50	0.38	11.14	0.17	10.59	0.42	NA	NA	11.14	0.17	NA
19AR26 Spot 87	1747.38	14398.78	0.56	21.61	1.89	0.01	2.34	0.00	1.36	0.58	11.09	0.15	10.72	0.25	NA	NA	11.09	0.15	NA
19AR26 Spot 88	1040.23	75191.65	2.01	21.46	1.26	0.05	2.00	0.01	1.55	0.77	55.49	0.85	54.03	1.05	NA	NA	55.49	0.85	NA
19AR26 Spot 89	3743.92	6557.62	0.29	6.07	20.28	0.05	20.54	0.00	3.16	0.15	13.27	0.42	45.36	9.11	2464.02	346.73	13.27	0.42	0.54
19AR26 Spot 90	1128.48	86425.28	0.44	22.22	2.01	0.01	2.63	0.00	1.70	0.65	11.07	0.19	10.60	0.28	NA	NA	11.07	0.19	NA
19AR26 Spot 91	2451.69	7525.49	4.82	13.18	4.80	0.02	4.99	0.00	1.36	0.27	12.82	0.17	20.16	1.00	1015.52	97.34	12.82	0.17	1.26
19AR26 Spot 92	690.23	27808.39	0.45	21.45	2.82	0.01	3.26	0.00	1.61	0.49	11.05	0.18	10.89	0.35	NA	NA	11.05	0.18	NA
19AR26 Spot 93	1081.61	12831.75	0.43	21.47	2.47	0.01	2.84	0.00	1.34	0.47	11.05	0.15	10.73	0.30	NA	NA	11.05	0.15	NA
19AR26 Spot 94	784.09	9613.54	0.40	21.03	2.00	0.01	2.69	0.00	1.70	0.63	10.88	0.18	10.70	0.29	NA	NA	10.88	0.18	NA
19AR26 Spot 95	1795.19	36220.68	0.28	21.30	1.54	0.01	2.02	0.00	1.31	0.65	10.88	0.14	10.83	0.22	NA	NA	10.88	0.14	NA
19AR26 Spot 96	894.23	26951.58	0.49	20.20	2.67	0.01	3.16	0.00	1.69	0.53	11.08	0.19	11.58	0.36	116.73	63.16	11.08	0.19	9.49
19AR26 Spot 97	778.09	4011.88	0.41	14.47	5.89	0.02	6.07	0.00	1.37	0.23	11.11	0.15	15.50	0.93	764.11	124.64	11.11	0.15	1.45
19AR26 Spot 98	982.82	27261.83	0.43	22.06	2.70	0.01	3.00	0.00	1.32	0.44	10.92	0.14	10.45	0.31	NA	NA	10.92	0.14	NA
19AR26 Spot 99	1518.73	6455.05	1.22	21.96	2.52	0.01	3.28	0.00	1.75	0.53	11.07	0.19	10.22	0.33	NA	NA	11.07	0.19	NA

Table S2 (Continued). U/Pb igneous zircon geochronologic analyses by LA-ICP-MS

Analysis	Isotope Ratios										Apparent Ages (Ma)								
	U (ppm)	206Pb 204Pb	U/Th	206Pb* 207Pb*	± 1σ (%)	207Pb* 235U	± 1σ (%)	206Pb* 238U	± 1σ (%)	error corr.	206Pb* 238U	± 1σ (Ma)	207Pb* 235U	± 1σ (Ma)	206Pb* 207Pb*	± 1σ (Ma)	**Best Age (Ma)**	**± 1σ (Ma)**	% conc
Sample 19AR27: (Lat/Long: 29.9827, 86.45224)–NAD 1983 coordinate system																			
19AR27 Spot 102	196.84	12535.93	3.49	21.35	2.76	0.05	3.58	0.01	1.88	0.53	55.65	1.04	53.30	1.86	NA	NA	55.65	1.04	NA
19AR27 Spot 103	250.63	22656.66	1.68	20.70	2.42	0.05	3.13	0.01	1.98	0.63	54.01	1.06	53.95	1.64	51.38	NA	54.01	1.06	105.11
19AR27 Spot 104	179.90	175974.03	1.33	19.96	2.47	0.06	2.85	0.01	1.42	0.50	54.16	0.76	56.72	1.57	166.46	57.68	54.16	0.76	32.54
19AR27 Spot 105	291.10	60813.46	1.55	21.59	2.82	0.05	3.88	0.01	2.67	0.69	55.53	1.48	53.66	2.03	NA	NA	55.53	1.48	NA
19AR27 Spot 107	496.63	21255.94	1.55	20.95	1.86	0.05	2.75	0.01	1.89	0.69	54.41	1.02	53.61	1.44	18.21	NA	54.41	1.02	298.75
19AR27 Spot 108	342.49	330168.92	2.62	21.19	2.06	0.06	2.96	0.01	2.13	0.72	57.93	1.23	57.18	1.64	25.57	NA	57.93	1.23	226.59
19AR27 Spot 109	186.49	9430.32	1.62	20.95	2.26	0.06	2.92	0.01	1.80	0.62	58.67	1.05	56.67	1.61	NA	NA	58.67	1.05	NA
19AR27 Spot 110	321.03	2813001.34	2.11	21.59	2.07	0.06	2.77	0.01	1.85	0.67	63.95	1.17	61.84	1.66	NA	NA	63.95	1.17	NA
19AR27 Spot 111	465.85	20351.69	2.89	21.68	1.81	0.05	2.67	0.01	1.95	0.73	53.98	1.05	51.36	1.34	NA	NA	53.98	1.05	NA
19AR27 Spot 112	177.79	20526.79	2.27	19.60	3.07	0.06	3.93	0.01	2.42	0.62	57.12	1.38	59.99	2.29	176.04	72.12	57.12	1.38	32.45
19AR27 Spot 113	888.89	30118.16	2.34	20.56	1.49	0.06	2.14	0.01	1.53	0.71	59.99	0.91	60.28	1.25	72.11	35.67	59.99	0.91	83.19
19AR27 Spot 114	4833.01	100345.30	0.89	19.85	1.13	0.06	2.46	0.01	2.18	0.89	52.70	1.15	55.36	1.32	171.90	26.33	52.70	1.15	30.66
19AR27 Spot 115	277.53	101352.47	2.25	21.45	2.42	0.05	3.16	0.01	2.03	0.64	55.22	1.12	53.72	1.65	NA	NA	55.22	1.12	NA
19AR27 Spot 116	252.79	6345.66	1.12	16.15	4.51	0.07	4.83	0.01	1.71	0.35	56.10	0.96	69.53	3.24	559.98	98.40	56.10	0.96	10.02
19AR27 Spot 117	256.64	309040.15	1.75	21.77	1.85	0.05	2.60	0.01	1.82	0.70	54.70	0.99	52.60	1.33	NA	NA	54.70	0.99	NA
19AR27 Spot 118	592.70	212201.78	6.85	16.55	1.09	0.67	2.04	0.08	1.72	0.85	507.70	8.42	522.00	8.32	585.07	23.57	507.70	8.42	86.78
19AR27 Spot 119	431.86	90930.52	1.24	20.73	2.20	0.06	2.86	0.01	1.83	0.64	56.36	1.03	56.66	1.58	69.30	52.34	56.36	1.03	81.33
19AR27 Spot 120	662.48	61722.88	2.75	21.30	1.83	0.06	3.03	0.01	2.41	0.80	55.60	1.33	54.37	1.60	0.66	NA	55.60	1.33	8375.80
19AR27 Spot 121	1236.74	48744.76	0.58	20.98	1.54	0.06	2.72	0.01	2.24	0.82	60.00	1.34	59.40	1.57	35.25	NA	60.00	1.34	170.21
19AR27 Spot 122	160.74	16019.34	2.40	20.51	2.54	0.06	3.24	0.01	1.87	0.58	55.72	1.04	55.77	1.76	57.94	NA	55.72	1.04	96.16
19AR27 Spot 124	151.06	6384.84	2.46	20.31	3.04	0.06	4.03	0.01	1.93	0.48	57.37	1.10	56.32	2.21	12.13	NA	57.37	1.10	472.81
19AR27 Spot 125	688.40	71689.75	2.83	20.66	1.74	0.06	2.75	0.01	2.13	0.77	56.74	1.20	57.15	1.53	74.39	41.27	56.74	1.20	76.27
19AR27 Spot 126	131.42	20910.62	2.15	21.04	3.24	0.06	3.87	0.01	2.12	0.55	59.12	1.25	57.84	2.18	5.18	NA	59.12	1.25	1140.92
19AR27 Spot 127	780.40	14658.94	3.12	20.89	1.46	0.06	2.34	0.01	1.82	0.78	57.20	1.04	56.03	1.27	6.34	NA	57.20	1.04	902.65
19AR27 Spot 128	733.55	26157.33	2.56	20.14	2.13	0.06	2.68	0.01	1.63	0.61	56.70	0.92	58.12	1.52	117.06	50.26	56.70	0.92	48.44
19AR27 Spot 129	122.64	4584.38	2.04	21.25	3.07	0.05	3.41	0.01	1.41	0.41	54.21	0.76	49.81	1.66	NA	NA	54.21	0.76	NA
19AR27 Spot 130	1214.92	67143.20	0.81	20.77	1.76	0.05	2.46	0.01	1.72	0.70	53.93	0.92	54.08	1.30	60.76	42.00	53.93	0.92	88.76
19AR27 Spot 131	387.26	9629.29	1.12	19.62	1.66	0.06	2.78	0.01	1.60	0.58	53.68	0.86	55.47	1.50	133.70	53.37	53.68	0.86	40.15
19AR27 Spot 132	1053.13	78309.79	2.31	20.70	1.67	0.06	2.41	0.01	1.73	0.72	57.84	1.00	58.12	1.36	69.44	39.79	57.84	1.00	83.30
19AR27 Spot 133	590.03	122364.77	2.25	20.65	1.57	0.07	2.58	0.01	2.05	0.79	65.59	1.34	65.95	1.65	79.05	37.40	65.59	1.34	82.96
19AR27 Spot 134	975.76	36505.21	1.86	20.91	1.60	0.06	2.39	0.01	1.76	0.74	56.74	0.99	56.23	1.31	34.53	NA	56.74	0.99	164.30
19AR27 Spot 135	339.32	19054.94	2.94	13.43	6.12	0.09	6.51	0.01	2.16	0.33	57.96	1.25	87.90	5.48	1003.19	124.81	57.96	1.25	5.78
19AR27 Spot 136	443.60	94513.74	2.60	15.71	2.73	0.08	3.30	0.01	1.85	0.56	56.75	1.05	74.67	2.38	694.43	58.28	56.75	1.05	8.17
19AR27 Spot 137	483.25	35208.21	1.45	21.09	1.72	0.06	2.31	0.01	1.53	0.66	55.27	0.84	54.39	1.23	15.65	NA	55.27	0.84	353.08
19AR27 Spot 138	270.01	53320.81	1.96	20.40	2.63	0.06	3.05	0.01	1.54	0.51	58.78	0.90	59.85	1.77	102.58	62.09	58.78	0.90	57.30
19AR27 Spot 139	399.88	64634.40	0.85	20.94	2.14	0.05	2.50	0.01	1.30	0.52	52.91	0.68	52.67	1.29	41.97	NA	52.91	0.68	126.07
19AR27 Spot 140	495.96	9614.84	2.62	21.19	1.66	0.05	2.40	0.01	1.53	0.64	55.31	0.84	52.90	1.23	NA	NA	55.31	0.84	NA
19AR27 Spot 141	150.95	26272.64	2.12	20.24	2.58	0.06	3.01	0.01	1.54	0.51	56.46	0.87	57.66	1.68	107.50	60.93	56.46	0.87	52.52
19AR27 Spot 142	182.20	6517.87	1.27	20.36	2.13	0.05	2.93	0.01	1.77	0.60	54.65	0.97	53.62	1.53	7.79	NA	54.65	0.97	701.72
19AR27 Spot 143	529.94	36553.41	2.15	21.50	1.72	0.05	2.45	0.01	1.70	0.69	56.21	0.95	54.26	1.30	NA	NA	56.21	0.95	NA
19AR27 Spot 144	423.20	25450.91	1.48	21.53	1.61	0.05	2.04	0.01	1.22	0.60	56.31	0.69	54.08	1.07	NA	NA	56.31	0.69	NA
19AR27 Spot 145	175.65	4018.81	1.19	19.84	2.74	0.06	3.21	0.01	1.62	0.50	58.46	0.94	57.13	1.79	1.76	NA	58.46	0.94	3330.76
19AR27 Spot 146	810.61	20951.61	0.75	20.92	1.01	0.05	1.74	0.01	1.42	0.81	53.87	0.76	53.11	0.90	19.09	NA	53.87	0.76	282.13
19AR27 Spot 147	127.53	21906.23	1.44	14.78	6.60	0.08	6.78	0.01	1.54	0.23	57.18	0.88	79.18	5.16	806.98	138.26	57.18	0.88	7.09
19AR27 Spot 148	285.73	134790.08	1.76	21.02	2.51	0.06	3.30	0.01	2.13	0.65	57.58	1.22	57.13	1.83	38.15	NA	57.58	1.22	150.93
19AR27 Spot 149	461.47	119384.35	1.68	20.82	1.45	0.06	2.25	0.01	1.72	0.77	56.08	0.96	56.18	1.23	60.70	34.45	56.08	0.96	92.39
19AR27 Spot 150	268.29	10422.66	1.73	20.96	2.55	0.05	3.22	0.01	1.94	0.60	55.64	1.07	53.95	1.69	NA	NA	55.64	1.07	NA

Table S2 (Continued). U/Pb igneous zircon geochronologic analyses by LA-ICP-MS

Analysis	Isotope Ratios										Apparent Ages (Ma)								
	U (ppm)	206Pb / 204Pb	U/Th	206Pb* / 207Pb*	± 1σ (%)	207Pb* / 235U	± 1σ (%)	206Pb* / 238U	± 1σ (%)	error corr.	206Pb* / 238U	± 1σ (Ma)	207Pb* / 235U	± 1σ (Ma)	206Pb* / 207Pb*	± 1σ (Ma)	**Best Age (Ma)**	**± 1σ (Ma)**	% conc
Sample 19KS34: (Lat/Long: 30.428588, 86.469721)–NAD 1983 coordinate system																			
19KS34 Spot 1	175.86	44221.85	2.47	20.87	1.43	0.16	1.75	0.02	1.00	0.57	151.23	1.49	147.06	2.39	80.22	34.00	151.23	1.49	188.53
19KS34 Spot 2	592.47	106763.93	2.38	20.18	0.94	0.16	1.69	0.02	1.40	0.83	152.28	2.10	153.35	2.40	169.86	22.04	152.28	2.10	89.65
19KS34 Spot 3	295.08	23265.76	2.17	20.33	1.17	0.16	1.55	0.02	1.00	0.64	151.88	1.50	150.43	2.17	127.71	27.90	151.88	1.50	118.93
19KS34 Spot 5	1098.20	183256.24	2.59	20.22	0.67	0.16	1.17	0.02	0.95	0.82	149.79	1.41	150.81	1.63	166.94	15.70	149.79	1.41	89.73
19KS34 Spot 6	870.86	355997.69	2.60	20.34	0.98	0.16	1.59	0.02	1.24	0.78	154.11	1.89	154.26	2.27	156.61	23.05	154.11	1.89	98.40
19KS34 Spot 7	727.73	37678.92	2.55	19.41	1.16	0.18	2.00	0.03	1.63	0.82	162.65	2.62	168.33	3.11	248.93	26.61	162.65	2.62	65.34
19KS34 Spot 8	245.59	94430.15	2.42	20.46	1.25	0.16	1.71	0.02	1.16	0.68	151.18	1.74	150.27	2.39	135.92	29.45	151.18	1.74	111.23
19KS34 Spot 9	731.18	179605.70	1.34	20.02	0.90	0.16	1.63	0.02	1.36	0.83	148.42	2.00	150.96	2.29	190.97	20.91	148.42	2.00	77.72
19KS34 Spot 10	772.83	499981.48	3.05	20.36	0.90	0.16	1.70	0.02	1.44	0.85	152.42	2.17	152.51	2.40	153.84	21.06	152.42	2.17	99.08
19KS34 Spot 11	840.19	127628.49	1.35	20.50	1.04	0.16	1.70	0.02	1.34	0.79	150.39	2.00	149.51	2.36	135.53	24.36	150.39	2.00	110.97
19KS34 Spot 12	338.70	203125.90	2.14	20.36	1.26	0.17	1.84	0.02	1.34	0.73	156.24	2.06	156.06	2.66	153.29	29.51	156.24	2.06	101.92
19KS34 Spot 13	600.08	90030.08	2.28	20.27	0.98	0.17	1.39	0.02	0.99	0.71	154.96	1.51	155.22	2.00	159.13	22.97	154.96	1.51	97.38
19KS34 Spot 14	419.39	26540.28	1.80	20.22	1.13	0.16	1.53	0.02	1.02	0.67	155.35	1.57	154.80	2.19	146.41	26.62	155.35	1.57	106.11
19KS34 Spot 15	516.32	60349.11	2.83	20.52	0.89	0.17	2.04	0.02	1.83	0.90	157.69	2.85	155.79	2.95	127.00	21.30	157.69	2.85	124.16
19KS34 Spot 16	1734.04	109122.94	2.85	20.39	0.80	0.15	1.64	0.02	1.42	0.87	146.23	2.06	146.25	2.23	146.54	18.88	146.23	2.06	99.79
19KS34 Spot 17	1114.38	95173.38	1.15	20.45	0.74	0.16	1.88	0.02	1.73	0.92	147.54	2.52	146.98	2.57	137.93	17.50	147.54	2.52	106.97
19KS34 Spot 18	1080.84	210803.89	1.32	20.28	0.90	0.16	1.58	0.02	1.30	0.82	151.25	1.95	151.89	2.23	161.88	20.93	151.25	1.95	93.43
19KS34 Spot 19	276.72	167410.41	2.07	20.46	1.33	0.18	2.10	0.03	1.63	0.78	171.21	2.76	169.13	3.28	140.15	31.11	171.21	2.76	122.16
19KS34 Spot 20	744.38	63707.13	1.65	20.11	0.89	0.16	1.62	0.02	1.35	0.83	151.16	2.02	152.56	2.30	174.35	20.96	151.16	2.02	86.70
19KS34 Spot 21	398.87	117682.67	1.45	20.59	1.02	0.16	1.58	0.02	1.20	0.76	149.92	1.78	148.28	2.18	122.20	24.11	149.92	1.78	122.68
19KS34 Spot 22	260.67	581623.95	6.07	15.47	1.28	0.35	1.68	0.04	1.09	0.65	248.96	2.66	305.38	4.43	762.24	26.93	248.96	2.66	32.66
19KS34 Spot 23	261.35	19249.91	1.79	20.85	0.93	0.16	1.45	0.03	1.11	0.76	159.29	1.74	153.23	2.06	60.40	22.34	159.29	1.74	263.71
19KS34 Spot 24	1467.61	142680.12	4.27	20.04	0.99	0.16	2.26	0.02	2.03	0.90	145.22	2.92	147.65	3.11	186.79	23.05	145.22	2.92	77.74
19KS34 Spot 25	363.31	12124.46	2.58	15.88	2.08	0.21	2.59	0.02	1.54	0.60	158.74	2.42	195.64	4.60	667.71	44.49	158.74	2.42	23.77
19KS34 Spot 26	1420.74	1486616.99	1.50	20.40	0.81	0.16	1.66	0.02	1.45	0.87	148.88	2.13	149.05	2.30	151.72	18.86	148.88	2.13	98.13
19KS34 Spot 27	332.33	56801.15	2.17	20.32	1.12	0.17	1.74	0.02	1.33	0.76	156.76	2.05	156.25	2.52	148.45	26.31	156.76	2.05	105.60
19KS34 Spot 28	910.91	77405.23	2.49	20.19	0.84	0.16	1.53	0.02	1.28	0.84	150.82	1.91	151.79	2.16	166.81	19.69	150.82	1.91	90.42
19KS34 Spot 29	254.84	17387.05	1.95	17.55	2.69	0.19	2.99	0.02	1.11	0.37	153.66	1.69	174.05	4.79	460.87	61.63	153.66	1.69	33.34
19KS34 Spot 30	607.56	214679.56	2.27	20.27	0.70	0.16	1.40	0.02	1.21	0.87	151.41	1.82	152.06	1.98	162.14	16.37	151.41	1.82	93.39
19KS34 Spot 31	712.44	71295.21	2.28	20.49	0.98	0.16	1.69	0.02	1.38	0.82	153.59	2.09	152.06	2.39	128.31	23.04	153.59	2.09	119.71
19KS34 Spot 32	275.91	69700.10	2.51	20.20	1.44	0.17	1.81	0.02	1.10	0.61	155.19	1.69	155.55	2.62	161.15	33.74	155.19	1.69	96.30
19KS34 Spot 33	1430.81	224001.01	2.22	20.15	0.74	0.16	1.65	0.02	1.47	0.89	148.32	2.15	149.85	2.29	174.16	17.31	148.32	2.15	85.16
19KS34 Spot 34	400.09	45213.41	1.99	20.60	0.97	0.16	1.57	0.02	1.24	0.79	153.95	1.88	151.29	2.21	109.71	22.84	153.95	1.88	140.32
19KS34 Spot 35	762.95	331879.74	3.25	20.25	0.96	0.16	1.78	0.02	1.50	0.84	152.47	2.26	153.18	2.53	164.15	22.37	152.47	2.26	92.89
19KS34 Spot 36	673.46	155516.89	1.55	20.43	0.76	0.16	1.43	0.02	1.21	0.85	150.79	1.80	150.25	1.99	141.71	17.77	150.79	1.80	106.41
19KS34 Spot 37	427.26	64879.38	1.83	20.76	0.90	0.16	1.81	0.02	1.57	0.86	152.73	2.36	149.39	2.52	96.60	21.58	152.73	2.36	158.11
19KS34 Spot 38	391.51	156487.08	2.35	20.55	1.09	0.17	2.13	0.03	1.83	0.86	160.20	2.90	158.14	3.12	127.48	25.63	160.20	2.90	125.66
19KS34 Spot 39	746.49	313243.99	2.58	20.14	1.34	0.16	2.09	0.02	1.60	0.77	153.33	2.42	154.79	3.00	177.32	31.31	153.33	2.42	86.47
19KS34 Spot 40	165.23	16459.92	2.65	19.99	1.62	0.16	2.04	0.02	1.23	0.60	149.03	1.81	149.35	2.84	154.31	38.20	149.03	1.81	96.58
19KS34 Spot 41	720.91	1448645.07	2.64	20.22	0.77	0.16	1.43	0.02	1.21	0.84	153.50	1.84	154.47	2.06	169.38	17.94	153.50	1.84	90.62
19KS34 Spot 42	700.88	440137.96	1.14	20.02	0.99	0.16	1.54	0.02	1.19	0.77	152.10	1.78	154.49	2.21	191.25	23.03	152.10	1.78	79.53
19KS34 Spot 43	1300.20	60915.51	0.73	19.82	0.72	0.16	1.50	0.02	1.32	0.88	147.99	1.93	151.44	2.12	205.86	16.74	147.99	1.93	71.89
19KS34 Spot 44	547.53	169837.77	2.67	20.22	1.08	0.16	1.74	0.02	1.36	0.78	152.80	2.06	153.60	2.48	165.91	25.31	152.80	2.06	92.10
19KS34 Spot 45	611.95	196968.34	1.67	20.36	1.21	0.17	2.08	0.03	1.70	0.81	162.40	2.72	161.65	3.11	150.68	28.33	162.40	2.72	107.78
19KS34 Spot 46	549.69	51204.67	3.07	20.52	0.93	0.16	1.78	0.02	1.51	0.85	152.74	2.28	150.82	2.49	120.72	22.05	152.74	2.28	126.52
19KS34 Spot 47	772.64	286039.15	2.84	20.29	0.92	0.16	1.49	0.02	1.17	0.79	150.96	1.75	151.44	2.10	158.92	21.62	150.96	1.75	94.99
19KS34 Spot 48	1446.11	190591.01	1.93	20.38	0.69	0.15	1.60	0.02	1.44	0.90	145.23	2.07	145.38	2.16	147.84	16.18	145.23	2.07	98.23
19KS34 Spot 49	830.47	73910.42	1.06	20.45	0.83	0.16	1.65	0.02	1.42	0.86	151.40	2.12	150.32	2.30	133.44	19.76	151.40	2.12	113.46
19KS34 Spot 50	1370.37	239342.80	1.75	20.31	0.64	0.16	1.82	0.02	1.71	0.94	150.50	2.54	150.88	2.56	156.74	15.00	150.50	2.54	96.02

Table S3. Zircon (U-Th)/He Thermochronology Results

Sample Name	Latitude (°N)	Longitude (°E)	Elevation (m)	Rs (um)	eU (ppm)	U (ppm)	Th (ppm)	4He nmol/g	Ft (238 U)	corr. date (Ma)	1s ± date (Ma)
22A479_19AL05_Zr1	29.542410	86.345830	5507	53.41	1104.81	1002.34	436.01	63.67	0.77	20.82	0.27
22A480_19AL05_Zr2	29.542410	86.345830	5507	45.94	287.31	247.77	168.28	23.18	0.74	21.22	0.27
22A481_19AL05_Zr3	29.542410	86.345830	5507	51.59	424.91	387.85	157.68	28.97	0.77	22.75	0.30
22A482_19AL05_Zr4	29.542410	86.345830	5507	39.37	289.02	248.59	172.03	16.80	0.70	18.09	0.23
22A483_19AL05_Zr5	29.542410	86.345830	5507	53.95	150.80	128.72	93.98	9.73	0.78	16.64	0.21
20A779_19AL06_Zr1	29.548790	86.345700	5855	65.55	739.23	669.94	294.85	45.64	0.81	133.17	2.10
20A780_19AL06_Zr2	29.548790	86.345700	5855	59.93	749.78	664.85	361.37	43.60	0.80	23.44	0.36
20A781_19AL06_Zr3	29.548790	86.345700	5855	53.75	923.29	685.61	1011.40	10.63	0.77	6.11	0.09
20A782_19AL06_Zr4	29.548790	86.345700	5855	60.50	1334.05	1218.87	490.13	88.76	0.80	19.70	0.25
20A783_19AL06_Zr5	29.548790	86.345700	5855	52.83	1653.85	1443.57	894.78	136.11	0.77	25.01	0.32
20A784_19AL07_Zr1	29.552930	86.344300	5786	54.14	512.44	441.20	303.15	42.17	0.78	22.75	0.29
20A785_19AL07_Zr2	29.552930	86.344300	5786	59.70	503.78	431.83	306.15	36.90	0.80	21.03	0.26
20A786_19AL07_Zr3	29.552930	86.344300	5786	60.60	748.21	645.30	437.93	53.07	0.80	19.95	0.25
20A787_19AL07_Zr4	29.552930	86.344300	5786	53.49	2268.39	1930.14	1439.33	155.34	0.77	21.18	0.26
20A788_19AL07_Zr5	29.552930	86.344300	5786	55.79	786.71	690.52	409.34	44.89	0.78	17.06	0.21
20A790_19AL08_Zr1	29.550960	86.337350	5610	55.94	417.04	362.39	232.52	29.08	0.78	18.64	0.24
20A791_19AL08_Zr2	29.550960	86.337350	5610	54.35	958.80	850.69	460.08	29.97	0.78	12.86	0.17
20A792_19AL08_Zr3	29.550960	86.337350	5610	60.15	944.65	835.07	466.30	72.66	0.80	23.94	0.31
20A793_19AL08_Zr4	29.550960	86.337350	5610	55.63	760.18	665.89	401.25	38.38	0.78	15.25	0.19
20A794_19AL08_Zr5	29.550960	86.337350	5610	59.82	619.21	540.36	335.54	35.36	0.80	18.78	0.24
22A484_19AL09_Zr1	29.529430	86.313648	5002	45.62	679.33	616.26	268.37	47.20	0.74	26.08	0.35
22A485_19AL09_Zr2	29.529430	86.313648	5002	40.50	644.85	554.14	385.99	55.30	0.71	31.26	0.40
22A486_19AL09_Zr3	29.529430	86.313648	5002	42.97	593.73	550.57	183.67	23.14	0.72	12.00	0.17
22A487_19AL09_Zr4	29.529430	86.313648	5002	41.79	204.27	175.31	123.21	24.63	0.72	38.71	0.51
22A488_19AL09_Zr5	29.529430	86.313648	5002	41.73	724.00	646.49	329.81	52.21	0.72	22.46	0.29
22A489_19AL10_Zr1	29.550810	86.211040	5058	58.86	237.03	200.67	154.72	13.39	0.79	15.56	0.19
22A490_19AL10_Zr2	29.550810	86.211040	5058	58.59	555.56	521.75	143.89	27.17	0.79	17.03	0.23
22A491_19AL10_Zr3	29.550810	86.211040	5058	56.68	340.52	310.51	127.71	20.29	0.79	18.65	0.24
22A492_19AL10_Zr4	29.550810	86.211040	5058	53.99	208.52	170.96	159.83	35.57	0.78	38.88	0.46
22A493_19AL10_Zr5	29.550810	86.211040	5058	58.44	133.30	115.53	75.62	8.22	0.79	16.29	0.20
22A495_19AL11_Zr1	29.546330	86.219750	4963	47.47	276.94	225.42	219.20	17.33	0.75	19.12	0.23
22A496_19AL11_Zr2	29.546330	86.219750	4963	52.26	109.85	101.39	36.03	8.72	0.77	23.82	0.32
22A497_19AL11_Zr3	29.546330	86.219750	4963	49.27	499.73	465.37	146.21	38.88	0.76	22.96	0.30
22A498_19AL11_Zr4	29.546330	86.219750	4963	52.58	308.02	269.84	162.48	22.10	0.77	24.84	0.32
22A499_19AL11_Zr5	29.546330	86.219750	4963	59.19	231.92	207.17	105.32	16.38	0.79	20.41	0.39
22A500_19AL12_Zr1	30.079375	86.301463	5011	42.03	590.67	497.29	397.38	88.66	0.72	47.84	0.59
22A501_19AL12_Zr2	30.079375	86.301463	5011	39.43	827.79	728.50	422.50	102.83	0.70	37.25	0.48
22A502_19AL12_Zr3	30.079375	86.301463	5011	49.46	191.72	166.33	108.05	29.25	0.76	42.44	0.54
22A502A_19AL12_Zr4	30.079375	86.301463	5011	51.90	400.57	330.42	298.52	32.90	0.77	40.61	0.51
22A503_19AL12_Zr5	30.079375	86.301463	5011	44.58	214.89	186.69	119.99	24.80	0.73	39.20	0.49
22A504_19AL13_Zr1	30.079922	86.300655	5052	61.58	135.07	113.49	91.83	21.58	0.80	39.99	0.68
22A505_19AL13_Zr2	30.079922	86.300655	5052	59.11	251.40	215.27	153.77	28.20	0.79	34.17	0.59
22A506_19AL13_Zr3	30.079922	86.300655	5052	48.27	669.86	594.59	320.29	137.38	0.75	54.50	0.96
22A507_19AL13_Zr4	30.079922	86.300655	5052	43.47	2171.73	1877.56	1251.81	366.31	0.73	53.97	0.68
22A508_19AL13_Zr5	30.079922	86.300655	5052	39.34	288.23	239.33	208.11	35.77	0.70	37.18	0.46
22A509_19AL14_Zr1	30.113070	86.334080	5161	53.56	382.01	331.63	214.39	69.65	0.77	51.04	0.64
22A510_19AL14_Zr2	30.113070	86.334080	5161	49.12	954.69	759.83	829.17	192.49	0.76	60.07	0.70
22A511_19AL14_Zr3	30.113070	86.334080	5161	46.64	194.59	166.61	119.05	29.21	0.74	45.52	0.72
22A512_19AL14_Zr4	30.113070	86.334080	5161	52.43	781.19	688.20	395.70	116.97	0.77	45.53	0.70
22A513_19AL14_Zr5	30.113070	86.334080	5161	59.36	1969.14	1796.74	733.62	485.31	0.79	67.84	0.90

Table S3 (Continued). Zircon (U-Th)/He Thermochronology Results											
Sample Name	Latitude (°N)	Longitude (°E)	Elevation (m)	Rs (um)	eU (ppm)	U (ppm)	Th (ppm)	4He nmol/g	Ft (238 U)	corr. date (Ma)	1s ± date (Ma)
22A731_19AL15_Zr1	29.545693	86.667312	4675	46.00	517.78	460.52	243.66	46.21	0.74	25.61	0.36
22A732_19AL15_Zr2	29.545693	86.667312	4675	50.52	518.23	445.44	309.77	60.87	0.76	29.88	0.45
22A733_19AL15_Zr3	29.545693	86.667312	4675	44.36	440.74	392.60	204.87	46.26	0.73	28.79	0.44
22A734_19AL15_Zr4	29.545693	86.667312	4675	48.41	511.92	447.50	274.12	2588.79	0.75	1318.26	21.73
22A735_19AL15_Zr5	29.545693	86.667312	4675	42.31	556.40	484.27	306.95	57.94	0.72	28.87	0.42
22A736_19AL18_Zr1	29.640538	86.699153	5036	68.98	270.40	219.09	218.33	27.99	0.82	28.84	0.34
22A737_19AL18_Zr2	29.640538	86.699153	5036	57.47	243.69	197.12	198.14	32.20	0.79	35.17	0.41
22A738_19AL18_Zr3	29.640538	86.699153	5036	50.89	213.97	176.86	157.94	21.11	0.76	27.27	0.42
22A740_19AL18_Zr4	29.640538	86.699153	5036	57.05	242.62	201.99	172.91	16.25	0.79	22.05	0.27
22A741_19AL18_Zr5	29.640538	86.699153	5036	48.74	223.78	184.38	167.66	19.68	0.75	28.18	0.34
22A742_19AL20_Zr1	29.808505	86.918758	5006	88.61	239.21	189.28	212.44	44.35	0.86	46.09	0.53
22A743_19AL20_Zr2	29.808505	86.918758	5006	93.49	207.85	167.09	173.45	29.74	0.87	43.27	0.52
22A744_19AL20_Zr3	29.808505	86.918758	5006	90.34	211.13	169.27	178.14	33.51	0.86	43.03	0.51
22A745_19AL20_Zr4	29.808505	86.918758	5006	81.39	152.07	121.52	130.01	27.72	0.85	43.61	0.51
22A746_19AL20_Zr5	29.808505	86.918758	5006	73.23	219.16	173.96	192.32	44.34	0.83	47.39	0.57
21B026_19AR01_Zr1	29.510315	87.033703	4817	64.25	515.12	371.78	609.96	41.22	0.81	23.33	0.26
21B027_19AR01_Zr2	29.510315	87.033703	4817	53.58	327.69	273.54	230.41	18.50	0.77	16.84	0.21
21B028_19AR01_Zr3	29.510315	87.033703	4817	55.06	189.86	148.05	177.89	7.59	0.78	11.77	0.14
21B029_19AR01_Zr4	29.510315	87.033703	4817	51.44	221.52	181.30	171.15	21.69	0.77	27.26	0.34
21B030_19AR01_Zr5	29.510315	87.033703	4817	49.60	691.43	549.78	602.79	23.13	0.76	11.95	0.15
21B031_19AR02_Zr1	29.498585	87.031647	5171	65.45	383.99	322.35	262.29	34.12	0.81	21.46	0.27
21B032_19AR02_Zr2	29.498585	87.031647	5171	56.98	285.46	229.17	239.53	11.37	0.79	12.01	0.15
21B033_19AR02_Zr3	29.498585	87.031647	5171	51.08	290.67	234.38	239.52	17.81	0.76	17.16	0.21
21B034_19AR02_Zr4	29.498585	87.031647	5171	52.60	424.47	341.22	354.24	22.80	0.77	15.65	0.19
21B035_19AR02_Zr5	29.498585	87.031647	5171	47.33	383.42	320.16	269.16	12.22	0.75	12.65	0.16
21B037_19AR03_Zr1	29.485400	87.028210	5318	54.94	254.92	205.73	209.33	17.22	0.78	19.70	0.25
21B038_19AR03_Zr2	29.485400	87.028210	5318	59.27	206.01	168.18	160.97	9.19	0.79	13.37	0.17
21B039_19AR03_Zr3	29.485400	87.028210	5318	56.99	329.20	261.15	289.57	28.03	0.79	23.30	0.30
21B040_19AR03_Zr4	29.485400	87.028210	5318	57.19	196.98	161.59	150.59	15.23	0.79	20.93	0.27
21B041_19AR03_Zr5	29.485400	87.028210	5318	47.74	216.92	175.15	177.73	22.82	0.75	23.36	0.31
20A795_19AR04_Zr1	29.410081	87.165103	4379	59.30	358.63	268.19	384.88	13.19	0.79	na	3812.66
20A796_19AR04_Zr2	29.410081	87.165103	4379	60.69	146.11	114.52	134.41	7.89	0.80	15.93	0.19
20A797_19AR04_Zr3	29.410081	87.165103	4379	62.04	535.21	414.20	514.95	47.52	0.80	25.83	0.35
20A798_19AR04_Zr4	29.410081	87.165103	4379	65.28	177.10	133.63	185.00	10.47	0.81	16.05	0.22
20A799_19AR04_Zr5	29.410081	87.165103	4379	69.14	285.29	224.33	259.42	18.22	0.82	17.16	0.24
21B042_19AR05_Zr1	29.423917	87.163843	4410	64.04	227.46	183.82	185.70	23.51	0.81	28.20	0.36
21B043_19AR05_Zr2	29.423917	87.163843	4410	67.60	236.93	184.25	224.16	24.10	0.82	26.81	0.33
21B044_19AR05_Zr3	29.423917	87.163843	4410	62.64	256.30	204.74	219.43	32.44	0.80	34.71	0.43
21B045_19AR05_Zr4	29.423917	87.163843	4410	58.52	276.35	227.09	209.61	26.38	0.79	27.53	0.35
21B046_19AR05_Zr5	29.423917	87.163843	4410	58.19	223.66	178.65	191.55	17.74	0.79	22.68	0.29
21B158_19AR06_Zr1	29.434158	87.158032	4442	81.77	180.66	148.01	138.94	26.64	0.85	34.94	0.43
21B159_19AR06_Zr2	29.434158	87.158032	4442	70.14	252.34	206.17	196.46	23.14	0.82	25.03	0.36
21B160_19AR06_Zr3	29.434158	87.158032	4442	78.23	249.08	207.14	178.46	22.36	0.84	24.42	0.31
21B161_19AR06_Zr4	29.434158	87.158032	4442	78.76	277.22	220.87	239.76	18.34	0.84	22.68	0.28
21B162_19AR06_Zr5	29.434158	87.158032	4442	56.68	274.21	226.08	204.83	15.24	0.79	17.29	0.21
20A805_19AR07_Zr1	29.466300	87.151700	4546	67.66	212.43	173.88	164.06	17.15	0.82	20.63	0.25
20A806_19AR07_Zr2	29.466300	87.151700	4546	67.68	208.38	171.50	156.92	16.42	0.82	19.16	0.23
20A951_19AR07_Zr3	29.466300	87.151700	4546	60.60	191.96	159.09	139.90	33.72	0.80	24.01	0.29
20A952_19AR07_Zr4	29.466300	87.151700	4546	53.49	210.94	169.56	176.05	26.86	0.77	19.98	0.23
20A953_19AR07_Zr5	29.466300	87.151700	4546	55.79	171.32	139.19	136.69	20.39	0.78	17.87	0.21

Table S3 (Continued). Zircon (U-Th)/He Thermochronology Results											
Sample Name	Latitude (°N)	Longitude (°E)	Elevation (m)	Rs (um)	eU (ppm)	U (ppm)	Th (ppm)	4He nmol/g	Ft (238 U)	corr. date (Ma)	1s ± date (Ma)
20A954_19AR08_Zr1	29.501040	87.159130	4722	55.94	279.80	234.92	190.98	30.32	0.78	19.44	0.23
20A955_19AR08_Zr2	29.501040	87.159130	4722	54.35	441.96	346.63	405.67	70.51	0.78	20.74	0.24
20A956_19AR08_Zr3	29.501040	87.159130	4722	60.15	150.89	119.04	135.54	9.42	0.80	15.88	0.18
20A957_19AR08_Zr4	29.501040	87.159130	4722	55.63	307.55	250.17	244.18	28.40	0.78	20.68	0.24
20A958_19AR08_Zr5	29.501040	87.159130	4722	59.82	299.12	261.16	161.52	93.47	0.80	21.76	0.27
21B163_19AR09_Zr1	29.562388	86.330188	5374	62.49	424.75	348.21	325.66	19.41	0.80	14.02	0.17
21B164_19AR09_Zr2	29.562388	86.330188	5374	49.99	1411.53	1286.24	533.17	63.18	0.76	14.74	0.20
21B165_19AR09_Zr3	29.562388	86.330188	5374	60.60	360.40	295.23	277.34	21.64	0.80	17.19	0.21
21B166_19AR09_Zr4	29.562388	86.330188	5374	70.07	322.79	264.01	250.13	18.82	0.82	14.52	0.24
21B167_19AR09_Zr5	29.562388	86.330188	5374	58.08	495.84	420.48	320.68	23.80	0.79	13.75	0.23
20A959_19AR10_Zr1	29.648425	86.350452	5367	66.65	1140.91	1058.92	348.93	102.92	0.82	17.61	0.23
20A960_19AR10_Zr2	29.648425	86.350452	5367	65.82	1118.93	1019.92	421.35	66.11	0.81	16.41	0.21
20A961_19AR10_Zr3	29.648425	86.350452	5367	52.65	658.31	607.23	217.37	39.61	0.77	18.09	0.24
20A963_19AR10_Zr4	29.648425	86.350452	5367	60.50	991.67	914.97	326.41	62.45	0.80	16.37	0.22
20A964_19AR10_Zr5	29.648425	86.350452	5367	74.95	738.08	659.94	332.52	66.72	0.84	18.43	0.24
20A965_19AR11_Zr1	29.648260	86.352092	5424	54.50	186.87	153.22	143.21	9.50	0.78	13.98	0.17
20A966_19AR11_Zr2	29.648260	86.352092	5424	64.71	2247.25	2061.06	792.29	122.85	0.81	15.18	0.20
20A967_19AR11_Zr3	29.648260	86.352092	5424	56.19	1124.24	981.81	606.08	67.07	0.78	15.96	0.20
20A968_19AR11_Zr4	29.648260	86.352092	5424	65.02	1371.45	1305.48	280.76	63.01	0.81	15.11	0.20
20A969_19AR11_Zr5	29.648260	86.352092	5424	63.07	726.76	654.45	307.69	40.55	0.81	14.09	0.18
20A970_19AR12_Zr1	29.647433	86.356102	5524	57.66	745.90	657.18	377.55	58.27	0.79	20.00	0.25
20A971_19AR12_Zr2	29.647433	86.356102	5524	61.49	1372.96	1282.30	385.78	75.20	0.80	14.32	0.19
20A972_19AR12_Zr3	29.647433	86.356102	5524	62.08	918.22	816.78	431.67	50.25	0.80	15.64	0.20
20A973_19AR12_Zr4	29.647433	86.356102	5524	60.28	1320.79	1195.89	531.51	69.79	0.80	14.70	0.19
20A974_19AR12_Zr5	29.647433	86.356102	5524	58.38	914.48	816.26	417.99	44.45	0.79	14.53	0.19
21B168_19AR13_Zr1	29.667639	86.206924	5000	104.49	964.64	724.24	1022.98	66.16	0.88	19.18	0.31
21B169_19AR13_Zr2	29.667639	86.206924	5000	108.36	385.10	304.26	343.99	19.05	0.88	17.71	0.24
21B170_19AR13_Zr3	29.667639	86.206924	5000	87.35	585.54	485.73	424.72	46.47	0.86	18.31	0.24
21B172_19AR13_Zr4	29.667639	86.206924	5000	101.59	781.96	583.50	844.48	67.87	0.88	19.59	0.23
21B173_19AR13_Zr5	29.667639	86.206924	5000	108.39	575.24	441.23	570.28	32.82	0.88	19.91	0.24
21B174_19AR14_Zr1	29.706723	86.181639	5324	62.08	368.21	296.46	305.32	41.10	0.80	30.76	0.38
21B175_19AR14_Zr2	29.706723	86.181639	5324	66.69	506.23	440.62	279.19	26.62	0.82	15.56	0.20
21B176_19AR14_Zr3	29.706723	86.181639	5324	64.97	228.19	184.42	186.22	10.27	0.81	16.65	0.20
21B177_19AR14_Zr4	29.706723	86.181639	5324	67.99	915.33	822.50	395.01	51.51	0.82	15.01	0.20
21B178_19AR14_Zr5	29.706723	86.181639	5324	54.83	840.73	722.71	502.20	69.49	0.78	22.85	0.30
21B179_19AR15_Zr1	29.720758	86.166673	5536	66.07	415.52	343.44	306.70	27.83	0.81	16.80	0.21
21B180_19AR15_Zr2	29.720758	86.166673	5536	67.15	404.98	331.15	314.18	22.64	0.82	15.48	0.19
21B181_19AR15_Zr3	29.720758	86.166673	5536	62.59	503.74	423.17	342.85	30.09	0.80	17.31	0.22
21B182_19AR15_Zr4	29.720758	86.166673	5536	62.88	579.02	498.37	343.18	35.93	0.81	16.27	0.21
21B183_19AR15_Zr5	29.720758	86.166673	5536	65.34	622.71	532.70	383.06	32.87	0.81	13.89	0.18
20A975_19AR16_Zr1	29.735243	86.290704	4957	66.50	749.39	650.06	422.66	44.95	0.82	16.38	0.21
20A976_19AR16_Zr2	29.735243	86.290704	4957	56.29	706.43	554.35	647.14	65.19	0.78	25.72	0.30
20A977_19AR16_Zr3	29.735243	86.290704	4957	65.28	491.81	262.89	974.12	26.35	0.81	13.57	0.14
20A978_19AR16_Zr4	29.735243	86.290704	4957	68.29	197.65	152.09	193.88	17.81	0.82	22.12	0.26
20A979_19AR16_Zr5	29.735243	86.290704	4957	62.49	725.72	630.33	405.95	43.34	0.80	16.05	0.20
20A980_19AR17_Zr1	29.729595	86.308456	5212	68.15	567.59	501.53	281.13	8.27	0.82	22.16	0.28
20A981_19AR17_Zr2	29.729595	86.308456	5212	68.03	1222.09	1051.01	727.98	84.03	0.82	21.04	0.27
20A982_19AR17_Zr3	29.729595	86.308456	5212	56.91	314.94	251.03	271.95	25.89	0.79	20.97	0.25
20BO64_19AR17_Zr4	29.729595	86.308456	5212	61.58	235.77	205.62	128.27	15.90	0.80	20.59	0.26
20BO65_19AR17_Zr5	29.729595	86.308456	5212	62.60	163.56	120.69	182.44	15.09	0.80	24.60	0.27

Table S3 (Continued). Zircon (U-Th)/He Thermochronology Results											
Sample Name	Latitude (°N)	Longitude (°E)	Elevation (m)	Rs (um)	eU (ppm)	U (ppm)	Th (ppm)	4He nmol/g	Ft (238 U)	corr. date (Ma)	1s ± date (Ma)
20B066_19AR18_Zr1	29.721146	86.304421	5109	63.81	469.80	379.62	383.72	43.75	0.81	22.42	0.26
20B067_19AR18_Zr2	29.721146	86.304421	5109	62.99	1157.39	1076.33	344.91	89.94	0.81	20.30	0.27
20B068_19AR18_Zr3	29.721146	86.304421	5109	70.99	952.11	872.26	339.79	67.58	0.83	15.68	0.20
20B069_19AR18_Zr4	29.721146	86.304421	5109	62.98	375.62	316.26	252.62	28.39	0.81	20.51	0.25
20B070_19AR18_Zr5	29.721146	86.304421	5109	64.49	618.46	571.61	199.35	42.06	0.81	17.89	0.23
21A606_AR21_19AR19_Zr1	29.913056	86.467470	5489	55.02	97.70	77.05	87.87	16.07	0.78	46.76	0.55
21A607_AR21_19AR19_Zr2	29.913056	86.467470	5489	62.72	922.92	802.21	513.64	212.74	0.81	65.91	0.82
21A608_AR21_19AR19_Zr3	29.913056	86.467470	5489	60.71	86.00	69.15	71.68	14.86	0.80	47.65	0.62
21A609_AR21_19AR19_Zr4	29.913056	86.467470	5489	59.10	437.57	379.95	245.18	81.62	0.79	59.93	0.74
21A610_AR21_19AR19_Zr5	29.913056	86.467470	5489	61.38	548.39	464.74	355.95	102.22	0.80	48.03	0.62
21A611_AR21_19AR20_Zr1	29.898924	86.459042	5282	55.21	1373.94	1202.07	731.37	11.77	0.79	56.46	0.75
21A612_AR21_19AR20_Zr2	29.898924	86.459042	5282	52.12	295.24	240.06	234.81	12.67	0.74	134.02	1.95
21A654_AR21_19AR20_Zr3	29.898924	86.459042	5282	58.66	103.70	84.25	82.74	174.19	0.76	35.38	0.47
21A655_AR21_19AR20_Zr4	29.898924	86.459042	5282	46.95	129.40	98.23	132.61	286.53	0.78	30.80	0.38
21A656_AR21_19AR20_Zr5	29.898924	86.459042	5282	49.33	893.75	777.62	494.18	133.41	0.77	59.29	0.80
21A657_AR21_19AR21_Zr1	29.590239	86.269258	4776	51.16	492.28	387.13	447.43	70.04	0.76	38.74	0.49
21A658_AR21_19AR21_Zr2	29.590239	86.269258	4776	50.70	332.12	267.25	276.04	27.24	0.76	22.57	0.29
21A659_AR21_19AR21_Zr3	29.590239	86.269258	4776	49.71	777.10	638.92	587.99	61.89	0.76	24.62	0.32
21A660_AR21_19AR21_Zr4	29.590239	86.269258	4776	47.11	1163.15	966.38	837.33	107.99	0.75	28.04	0.35
21A661_AR21_19AR21_Zr5	29.590239	86.269258	4776	48.24	754.98	615.18	594.88	70.56	0.75	26.21	0.33
21A590_AR21_19AR22_Zr1	30.162284	86.355441	5043	79.47	1342.49	1056.69	1216.19	20.92	0.84	4.12	0.05
21A591_AR21_19AR22_Zr2	30.162284	86.355441	5043	67.25	2085.25	1778.33	1306.03	45.30	0.82	5.74	0.07
21A592_AR21_19AR22_Zr3	30.162284	86.355441	5043	76.08	3887.12	3584.46	1287.92	57.56	0.84	4.68	0.06
21A593_AR21_19AR22_Zr4	30.162284	86.355441	5043	65.75	3228.14	2782.00	1898.44	51.99	0.81	4.16	0.05
21A594_AR21_19AR22_Zr5	30.162284	86.355441	5043	57.90	2016.49	1822.94	823.59	37.55	0.79	4.90	0.07
21A595_AR21_19AR23_Zr1	30.162600	86.340210	5217	53.15	192.38	160.62	135.16	16.73	0.77	23.69	0.30
21A596_AR21_19AR23_Zr2	30.162600	86.340210	5217	51.51	2623.63	2370.31	1077.96	163.43	0.77	20.85	0.28
21A597_AR21_19AR23_Zr3	30.162600	86.340210	5217	53.98	5550.39	5037.08	2184.28	417.99	0.78	28.11	0.36
21A598_AR21_19AR23_Zr4	30.162600	86.340210	5217	57.28	155.68	138.24	74.22	13.85	0.79	22.25	0.28
21A599_AR21_19AR23_Zr5	30.162600	86.340210	5217	51.15	343.67	289.00	232.65	35.89	0.76	27.90	0.33
21A600_AR21_19AR24_Zr1	30.161614	86.323944	5275	60.03	1552.84	1379.26	738.61	41.47	0.80	7.27	0.09
21A602_AR21_19AR24_Zr2	30.161614	86.323944	5275	57.59	1326.13	1216.76	465.41	35.80	0.79	8.58	0.12
21A603_AR21_19AR24_Zr3	30.161614	86.323944	5275	53.50	632.83	556.21	326.06	26.76	0.77	10.85	0.14
21A604_AR21_19AR24_Zr4	30.161614	86.323944	5275	50.37	677.42	611.70	279.65	26.74	0.76	10.92	0.14
21A605_AR21_19AR24_Zr5	30.161614	86.323944	5275	54.72	825.07	709.99	489.71	19.75	0.78	7.28	0.09
20B071_19AR25_Zr1	29.958542	86.467537	5615	62.60	808.47	680.32	545.31	25.60	0.80	7.81	0.09
20B072_19AR25_Zr2	29.958542	86.467537	5615	51.92	1746.93	1503.10	1037.55	53.84	0.77	7.73	0.10
20B073_19AR25_Zr3	29.958542	86.467537	5615	59.73	836.45	687.92	632.04	28.81	0.80	8.60	0.10
20B074_19AR25_Zr4	29.958542	86.467537	5615	55.50	738.45	591.88	623.69	24.76	0.78	8.50	0.10
20B075_19AR25_Zr5	29.958542	86.467537	5615	62.32	769.17	628.06	600.45	28.00	0.80	7.93	0.09
20A800_19AR26_Zr1	29.960120	86.469700	5539	62.60	3614.47	2187.07	6074.06	125.82	0.80	8.56	0.11
20A801_19AR26_Zr2	29.960120	86.469700	5539	61.36	1645.27	1272.37	1586.79	36.38	0.80	7.58	0.09
20A802_19AR26_Zr3	29.960120	86.469700	5539	63.48	402.17	354.45	203.08	25.21	0.81	37.01	0.48
20A803_19AR26_Zr4	29.960120	86.469700	5539	56.37	284.43	230.20	230.76	8.93	0.78	8.69	0.11
20A804_19AR26_Zr5	29.960120	86.469700	5539	52.85	1523.20	1263.07	1106.95	39.80	0.77	7.69	0.09
20B076_19AR27_Zr1	29.982700	86.452240	5369	61.74	798.97	710.05	378.36	22.23	0.80	7.96	0.10
20B077_19AR27_Zr2	29.982700	86.452240	5369	58.68	372.59	330.68	178.33	12.69	0.79	9.05	0.11
20B078_19AR27_Zr3	29.982700	86.452240	5369	56.52	546.88	459.28	372.77	23.76	0.79	10.62	0.13
20B079_19AR27_Zr4	29.982700	86.452240	5369	60.15	551.02	499.42	219.60	19.38	0.80	8.81	0.11
20B080_19AR27_Zr5	29.982700	86.452240	5369	56.97	1316.82	1177.71	591.97	34.59	0.79	7.71	0.10

Table S3 (Continued). Zircon (U-Th)/He Thermochronology Results											
Sample Name	Latitude (°N)	Longitude (°E)	Elevation (m)	Rs (um)	eU (ppm)	U (ppm)	Th (ppm)	4He nmol/g	Ft (238 U)	corr. date (Ma)	1s ± date (Ma)
22A134_19GR01_Zr1	29.634465	87.065858	4949	58.80	265.14	214.07	217.31	24.54	0.79	21.28	0.25
22A135_19GR01_Zr2	29.634465	87.065858	4949	69.73	269.32	215.28	229.99	21.13	0.82	20.31	0.24
22A136_19GR01_Zr3	29.634465	87.065858	4949	60.85	263.77	204.63	251.66	18.23	0.80	19.92	0.23
22A137_19GRO1_Zr4	29.634465	87.065858	4949	56.83	176.12	140.38	152.07	13.65	0.79	19.98	0.24
22A138_19GRO1_Zr5	29.634465	87.065858	4949	74.43	238.13	188.34	211.86	23.53	0.83	27.39	0.32
22A139_19GRO2_Zr1	29.634643	87.073496	5329	73.32	229.76	188.34	176.25	20.97	0.83	23.06	0.28
22A140_19GR02_Zr2	29.634643	87.073496	5329	77.04	202.94	164.95	161.67	15.53	0.84	18.33	0.21
22A141_19GR02_Zr3	29.634643	87.073496	5329	76.95	218.72	178.21	172.38	14.77	0.84	16.70	0.19
22A142_19GR02_Zr4	29.634643	87.073496	5329	67.23	240.87	200.14	173.33	21.25	0.82	20.08	0.24
22A143_19GR02_Zr5	29.634643	87.073496	5329	77.38	195.50	162.09	142.15	17.39	0.84	23.58	0.29
22A144_19GR03_Zr1	29.636049	87.078411	5405	53.96	264.01	213.77	213.78	21.89	0.78	22.22	0.26
22A145_19GR03_Zr2	29.636049	87.078411	5405	47.06	451.93	356.77	404.93	30.73	0.75	19.23	0.24
22A146_19GR03_Zr3	29.636049	87.078411	5405	47.78	281.39	228.51	225.03	16.39	0.75	15.89	0.19
22A148_19GR03_Zr4	29.636049	87.078411	5405	57.57	205.11	166.82	162.94	20.91	0.79	20.43	0.24
22A149_19GR03_Zr5	29.636049	87.078411	5405	56.94	253.12	204.65	206.29	16.67	0.79	20.91	0.25
22A150_19GR05_Zr1	29.653570	87.072730	5003	56.75	636.67	556.42	341.50	38.08	0.79	14.49	0.18
22A151_19GR05_Zr2	29.653570	87.072730	5003	54.18	1399.40	1228.99	725.14	99.46	0.78	16.57	0.21
22A152_19GR05_Zr3	29.653570	87.072730	5003	49.74	1959.34	1767.01	818.45	113.49	0.76	15.74	0.20
22A153_19GR05_Zr4	29.653570	87.072730	5003	52.58	1044.48	964.17	341.73	60.54	0.77	15.55	0.20
22A154_19GR05_Zr5	29.653570	87.072730	5003	61.17	1238.35	1138.61	424.45	86.50	0.80	15.90	0.22
22A155_19GR06_Zr1	29.650390	87.078930	5308	49.73	274.93	219.93	234.08	20.91	0.76	23.07	0.30
22A156_19GR06_Zr2	29.650390	87.078930	5308	50.32	161.43	132.38	123.63	10.76	0.76	19.09	0.23
22A157_19GR06_Zr3	29.650390	87.078930	5308	54.19	232.55	189.83	181.82	17.58	0.78	23.43	0.28
22A158_19GR06_Zr4	29.650390	87.078930	5308	51.41	390.27	286.97	439.55	31.71	0.77	22.31	0.30
22A159_19GR06_Zr5	29.650390	87.078930	5308	67.38	225.75	183.96	177.82	11.27	0.82	16.59	0.20
22A160_19GR07_Zr1	29.646140	87.083400	5595	70.38	216.22	175.35	173.89	12.54	0.83	17.54	0.20
22A161_19GR07_Zr2	29.646140	87.083400	5595	69.48	202.92	168.42	146.82	16.52	0.82	20.19	0.25
22A162_19GR07_Zr3	29.646140	87.083400	5595	60.58	237.65	196.02	177.11	18.41	0.80	18.79	0.22
22A163_19GR07_Zr4	29.646140	87.083400	5595	59.85	292.34	243.21	209.05	16.59	0.80	17.59	0.21
22A164_19GR07_Zr5	29.646140	87.083400	5595	47.93	205.64	165.87	169.22	14.80	0.75	18.59	0.22
21A574_AR21_19KS32_Zr1	30.423606	86.487434	4963	69.56	484.19	418.86	278.03	71.79	0.82	40.04	0.50
21A575_AR21_19KS32_Zr2	30.423606	86.487434	4963	63.47	981.21	870.71	470.21	169.05	0.81	50.56	0.64
21A576_AR21_19KS32_Zr3	30.423606	86.487434	4963	64.06	747.71	666.63	344.99	139.62	0.81	50.74	0.64
21A577_AR21_19KS32_Zr4	30.423606	86.487434	4963	57.97	682.58	593.85	377.60	122.32	0.79	52.47	0.65
21A578_AR21_19KS32_Zr5	30.423606	86.487434	4963	60.50	973.28	841.75	559.71	190.12	0.80	55.14	0.69
21A579_AR21_19KS33_Zr1	30.427349	86.477097	5307	66.13	1061.63	951.01	470.70	242.31	0.81	63.67	0.81
21A580_AR21_19KS33_Zr2	30.427349	86.477097	5307	69.00	808.00	714.50	397.88	168.58	0.82	56.33	0.71
21A581_AR21_19KS33_Zr3	30.427349	86.477097	5307	56.90	793.41	692.84	427.96	184.11	0.79	60.00	0.77
21A582_AR21_19KS33_Zr4	30.427349	86.477097	5307	89.28	956.97	853.65	439.64	223.05	0.86	59.41	0.76
21A583_AR21_19KS33_Zr5	30.427349	86.477097	5307	70.89	869.44	751.07	503.68	195.28	0.83	57.22	0.72
21A584_AR21_19KS34_Zr1	30.428588	86.469721	5452	73.66	1142.35	1019.39	523.21	208.66	0.83	52.83	0.69
21A585_AR21_19KS34_Zr2	30.428588	86.469721	5452	56.44	1080.16	962.69	499.87	197.12	0.78	53.27	0.69
21A586_AR21_19KS34_Zr3	30.428588	86.469721	5452	66.61	1189.29	1035.54	654.27	268.62	0.82	59.45	0.75
21A588_AR21_19KS34_Zr4	30.428588	86.469721	5452	69.68	1215.08	1089.80	533.13	200.04	0.82	53.09	0.68
21A589_AR21_19KS34_Zr5	30.428588	86.469721	5452	58.28	1159.90	1021.47	589.09	196.80	0.79	51.43	0.66

Tangra Yumco Rift - data for IDW plot			
dist IYS (km)	Longitude (°E)	Latitude (°N)	IDW Age (Ma)
1	86.31723138	29.54252639	15.20554256
2	86.31867598	29.55284371	15.28102016
3	86.32012059	29.56316102	14.89366245
4	86.3215652	29.57347833	14.58555412
5	86.32300981	29.58379564	14.76357651
6	86.32445441	29.59411295	14.90480232
7	86.32589902	29.60443026	15.07393265
8	86.32734363	29.61474758	15.30504227
9	86.32878823	29.62506489	15.56320858
10	86.33023284	29.6353822	15.84788036
11	86.33167745	29.64569951	16.0824585
12	86.33312205	29.65601682	16.18561935
13	86.33456666	29.66633413	16.10551453
14	86.33601127	29.67665145	16.02862549
15	86.33745587	29.68696876	15.99390411
16	86.33890048	29.69728607	15.9703064
17	86.34034509	29.70760338	15.96060371
18	86.3417897	29.71792069	15.94835854
19	86.3432343	29.728238	15.9618187
20	86.34467891	29.73855532	15.97371292
21	86.34612352	29.74887263	15.99444866
22	86.34756812	29.75918994	16.01004219
23	86.34901273	29.76950725	16.0255928
24	86.35045734	29.77982456	15.56683731
25	86.35190194	29.79014187	15.25494385
26	86.35334655	29.80045919	15.03032494
27	86.35479116	29.8107765	14.76407433
28	86.35623576	29.82109381	14.44913387
29	86.35768037	29.83141112	14.14716053
30	86.35912498	29.84172843	13.76739693
31	86.36056959	29.85204574	13.36015606
32	86.36201419	29.86236306	12.99859715
33	86.3634588	29.87268037	12.65665913
34	86.36490341	29.88299768	11.94231415
35	86.36634801	29.89331499	11.54499912
36	86.36779262	29.9036323	10.66906071
37	86.36923723	29.91394961	10.36798763
38	86.37068183	29.92426693	10.16287422
39	86.37212644	29.93458424	9.933423996
40	86.37357105	29.94490155	9.739822388
41	86.37501565	29.95521886	9.639507294
42	86.37646026	29.96553617	9.512231827
43	86.37790487	29.97585348	9.468317986
44	86.37934947	29.9861708	9.394778252
45	86.38079408	29.99648811	9.411762238
46	86.38223869	30.00680542	9.372403145
47	86.3836833	30.01712273	9.401972771
48	86.3851279	30.02744004	9.372060776
49	86.38657251	30.03775735	9.367026329
50	86.38801712	30.04807467	9.324325562

Tangra Yumco Rift - data for IDW plot (continued)			
dist IYS (km)	Longitude (°E)	Latitude (°N)	IDW Age (Ma)
51	86.38946172	30.05839198	9.261943817
52	86.39090633	30.06870929	9.188922882
53	86.39235094	30.0790266	9.070631981
54	86.39379554	30.08934391	8.921917915
55	86.39524015	30.09966122	8.740722656
56	86.39668476	30.10997854	8.518283844
57	86.39812936	30.12029585	8.300806999
58	86.39957397	30.13061316	8.050033569
59	86.40101858	30.14093047	7.869047642
60	86.40246319	30.15124778	7.785471439
61	86.40390779	30.16156509	7.712820053
62	86.4053524	30.17188241	7.800501823
63	86.40679701	30.18219972	7.879427433
64	86.40824161	30.19251703	8.033330917
65	86.40968622	30.20283434	8.10680294
66	86.41113083	30.21315165	8.238845825
67	86.41257543	30.22346896	8.368473053
68	86.41402004	30.23378628	8.508794785
69	86.41546465	30.24410359	8.633741379
70	86.41690925	30.2544209	8.73514843
71	86.41835386	30.26473821	8.837797165
72	86.41979847	30.27505552	8.923951149
73	86.42124308	30.28537283	9.009944916
74	86.42268768	30.29569015	9.084227562
75	86.42413229	30.30600746	9.157958984
76	86.4255769	30.31632477	9.223144531
77	86.4270215	30.32664208	9.287675858
78	86.42846611	30.33695939	9.345788002
79	86.42991072	30.3472767	9.403222084
80	86.43135532	30.35759402	9.457577705
81	86.43279993	30.36791133	9.507491112
82	86.43424454	30.37822864	9.545062065
83	86.43568914	30.38854595	9.591252327
84	86.43713375	30.39886326	9.6367836
85	86.43857836	30.40918057	9.679328918
86	86.44002297	30.41949789	9.721128464
87	86.44146757	30.4298152	9.760450363
88	86.44291218	30.44013251	9.798901558
89	86.44435679	30.45044982	9.835716248
90	86.44580139	30.46076713	9.870605469
91	86.447246	30.47108444	9.904363632
92	86.44869061	30.48140176	9.936526299
93	86.45013521	30.49171907	9.967303276
94	86.45157982	30.50203638	9.996823311
95	86.45302443	30.51235369	10.02464962
96	86.45446903	30.522671	10.05162811
97	86.45591364	30.53298831	10.07654285
98	86.45735825	30.54330563	10.09509659
99	86.45880286	30.55362294	10.11750317
100	86.46024746	30.56394025	10.13834572

Tangra Yumco Rift - data for IDW plot (continued)			
dist IYS (km)	Longitude (°E)	Latitude (°N)	IDW Age (Ma)
101	86.46169207	30.57425756	10.16005135
102	86.46313668	30.58457487	10.17831707
103	86.46458128	30.59489218	10.19878101
104	86.46602589	30.6052095	10.21483231
105	86.4674705	30.61552681	10.23511124
106	86.4689151	30.62584412	10.24935341
107	86.47035971	30.63616143	10.27103043
108	86.47180432	30.64647874	10.28348064
109	86.47324892	30.65679605	10.29231834
110	86.47469353	30.66711337	10.31681061
111	86.47613814	30.67743068	10.31320381
112	86.47758275	30.68774799	10.33110809
113	86.47902735	30.6980653	10.25316811
114	86.48047196	30.70838261	10.17713165
115	86.48191657	30.71869992	9.642644882
116	86.48336117	30.72901724	8.724476814
117	86.48480578	30.73933455	8.518141747
118	86.48625039	30.74965186	8.989893913
119	86.48769499	30.75996917	9.351471901
120	86.4891396	30.77028648	9.55917263
121	86.49058421	30.78060379	9.703438759
122	86.49202881	30.79092111	9.786641121
123	86.49347342	30.80123842	9.855834007
124	86.49491803	30.81155573	9.898461342
125	86.49636264	30.82187304	9.938437462
126	86.49780724	30.83219035	9.964500427
127	86.49925185	30.84250766	9.990852356
128	86.50069646	30.85282498	10.00893497
129	86.50214106	30.86314229	10.02488708
130	86.50358567	30.8734596	10.03781509
131	86.50503028	30.88377691	10.0507822
132	86.50647488	30.89409422	10.06477833
133	86.50791949	30.90441153	10.07556629
134	86.5093641	30.91472885	10.08731461
135	86.5108087	30.92504616	10.09671974
136	86.51225331	30.93536347	10.10697174
137	86.51369792	30.94568078	10.11545467
138	86.51514253	30.95599809	10.12365818
139	86.51658713	30.9663154	10.13250637
140	86.51803174	30.97663272	10.14014626
141	86.51947635	30.98695003	10.14833736
142	86.52092095	30.99726734	10.15555668
143	86.52236556	31.00758465	10.16324425
144	86.52381017	31.01790196	10.1701355
145	86.52525477	31.02821927	10.17742538
146	86.52669938	31.03853659	10.18405056
147	86.52814399	31.0488539	10.18884945
148	86.52958859	31.05917121	10.19571877
149	86.5310332	31.06948852	10.20206547
150	86.53247781	31.07980583	10.20867157
151	86.53392242	31.09012314	10.21482563
152	86.53414772	31.09173227	10.21642971

North + South Lunggar Rift - data for IDW plot			
dist IYS (km)	Longitude (°E)	Latitude (°N)	IDW Age (Ma)
1	83.40127307	30.4809764	8.072335243
2	83.40253099	30.4914295	8.075943947
3	83.4037889	30.50188259	8.078351974
4	83.40504681	30.51233568	8.082262993
5	83.40630472	30.52278877	8.086373329
6	83.40756264	30.53324186	8.089839935
7	83.40882055	30.54369495	8.094360352
8	83.41007846	30.55414805	8.098187447
9	83.41133638	30.56460114	8.103182793
10	83.41259429	30.57505423	8.107430458
11	83.4138522	30.58550732	8.112978935
12	83.41511012	30.59596041	8.118865013
13	83.41636803	30.60641351	8.123921394
14	83.41762594	30.6168666	8.130521774
15	83.41888385	30.62731969	8.136227608
16	83.42014177	30.63777278	8.143681526
17	83.42139968	30.64822587	8.151664734
18	83.42265759	30.65867896	8.158658981
19	83.42391551	30.66913206	8.166239738
20	83.42517342	30.67958515	8.17420578
21	83.42643133	30.69003824	8.18461132
22	83.42768925	30.70049133	8.195894241
23	83.42894716	30.71094442	8.206056595
24	83.43020507	30.72139751	8.219321251
25	83.43146298	30.73185061	8.231438637
26	83.4327209	30.7423037	8.247275352
27	83.43397881	30.75275679	8.264781952
28	83.43523672	30.76320988	8.281256676
29	83.43649464	30.77366297	8.302790642
30	83.43775255	30.78411607	8.323552132
31	83.43901046	30.79456916	8.350769043
32	83.44026838	30.80502225	8.381887436
33	83.44152629	30.81547534	8.413525581
34	83.4427842	30.82592843	8.455273628
35	83.44404211	30.83638152	8.49024868
36	83.44530003	30.84683462	8.547689438
37	83.44655794	30.85728771	8.618593216
38	83.44781585	30.8677408	8.714668274
39	83.44907377	30.87819389	8.833132744
40	83.45033168	30.88864698	8.996729851
41	83.45158959	30.89910008	9.277324677
42	83.45284751	30.90955317	9.810049057
43	83.45410542	30.92000626	9.258556366
44	83.45536333	30.93045935	8.851764679
45	83.45662124	30.94091244	8.172851563
46	83.45787916	30.95136553	7.55602932
47	83.45913707	30.96181863	7.102750301
48	83.46039498	30.97227172	7.002426624
49	83.4616529	30.98272481	7.02081871
50	83.46291081	30.9931779	6.919816971

North + South Lunggar Rift - data for IDW plot (continued)			
dist IYS (km)	Longitude (°E)	Latitude (°N)	IDW Age (Ma)
51	83.46416872	31.00363099	6.517771244
52	83.46542664	31.01408409	6.150841713
53	83.46668455	31.02453718	5.605199814
54	83.46794246	31.03499027	5.444464684
55	83.46920037	31.04544336	5.152607918
56	83.47045829	31.05589645	5.069313526
57	83.4717162	31.06634954	4.924839973
58	83.47297411	31.07680264	4.842535019
59	83.47423203	31.08725573	4.856452465
60	83.47548994	31.09770882	4.80203104
61	83.47674785	31.10816191	4.778106213
62	83.47800577	31.118615	4.701274395
63	83.47926368	31.1290681	4.680101871
64	83.48052159	31.13952119	4.684148788
65	83.4817795	31.14997428	4.694835663
66	83.48303742	31.16042737	4.739466667
67	83.48429533	31.17088046	4.764976978
68	83.48555324	31.18133355	4.76798296
69	83.48681116	31.19178665	4.763077259
70	83.48806907	31.20223974	4.721805573
71	83.48932698	31.21269283	4.687702656
72	83.4905849	31.22314592	4.599205971
73	83.49184281	31.23359901	4.566991806
74	83.49310072	31.24405211	4.534482479
75	83.49435863	31.2545052	4.498691082
76	83.49561655	31.26495829	4.462845325
77	83.49687446	31.27541138	4.341534138
78	83.49813237	31.28586447	4.019319534
79	83.49939029	31.29631756	3.966225863
80	83.5006482	31.30677066	3.799100876
81	83.50190611	31.31722375	3.776564121
82	83.50316403	31.32767684	3.825717688
83	83.50442194	31.33812993	3.82157588
84	83.50567985	31.34858302	3.826191664
85	83.50693776	31.35903611	3.822963715
86	83.50819568	31.36948921	3.85010004
87	83.50945359	31.3799423	3.86874795
88	83.5107115	31.39039539	3.953817844
89	83.51196942	31.40084848	4.09756422
90	83.51322733	31.41130157	4.323982239
91	83.51448524	31.42175467	4.565349102
92	83.51574316	31.43220776	4.442575932
93	83.51700107	31.44266085	3.971517563
94	83.51825898	31.45311394	3.630546808
95	83.51951689	31.46356703	3.370006561
96	83.52077481	31.47402012	3.186725855
97	83.52203272	31.48447322	3.187409401
98	83.52329063	31.49492631	3.339655399
99	83.52454855	31.5053794	3.547423601
100	83.52580646	31.51583249	3.866266727

North + South Lunggar Rift - data for IDW plot (continued)			
dist IYS (km)	Longitude (°E)	Latitude (°N)	IDW Age (Ma)
101	83.52706437	31.52628558	4.314351082
102	83.52832229	31.53673868	4.703399181
103	83.5295802	31.54719177	3.73480463
104	83.53083811	31.55764486	3.152592421
105	83.53209602	31.56809795	3.133322716
106	83.53335394	31.57855104	2.779170036
107	83.53461185	31.58900413	3.121886015
108	83.53586976	31.59945723	3.260592699
109	83.53712768	31.60991032	3.494796753
110	83.53838559	31.62036341	3.62291646
111	83.5396435	31.6308165	3.79882431
112	83.54090142	31.64126959	3.905653954
113	83.54215933	31.65172269	3.94656539
114	83.54341724	31.66217578	3.972410202
115	83.54467515	31.67262887	3.965087652
116	83.54593307	31.68308196	3.961261749
117	83.54719098	31.69353505	4.02796793
118	83.54844889	31.70398814	4.017512321
119	83.54970681	31.71444124	4.011580467
120	83.55096472	31.72489433	4.001374722
121	83.55222263	31.73534742	3.99510479
122	83.55348055	31.74580051	3.986335278
123	83.55473846	31.7562536	3.978494167
124	83.55599637	31.7667067	3.973367691
125	83.55725428	31.77715979	3.966826439
126	83.5585122	31.78761288	3.962408066
127	83.55977011	31.79806597	3.95694232
128	83.56102802	31.80851906	3.952000141
129	83.56228594	31.81897215	3.948554516
130	83.56354385	31.82942525	3.944366693
131	83.56480176	31.83987834	3.941391945
132	83.56605968	31.85033143	3.937810659
133	83.56731759	31.86078452	3.934519768
134	83.5685755	31.87123761	3.932603598
135	83.56983341	31.88169071	3.929713488
136	83.57109133	31.8921438	3.927599669
137	83.57234924	31.90259689	3.925073385
138	83.57360715	31.91304998	3.922722578
139	83.57486507	31.92350307	3.920981407
140	83.57612298	31.93395616	3.918902397
141	83.57738089	31.94440926	3.9173491
142	83.57863881	31.95486235	3.915498734
143	83.57989672	31.96531544	3.913759947
144	83.58115463	31.97576853	3.912449121
145	83.58241254	31.98622162	3.910887003
146	83.58367046	31.99667471	3.909702063
147	83.58492837	32.00712781	3.908291817
148	83.58618628	32.0175809	3.906956434
149	83.5874442	32.02803399	3.905936718
150	83.58870211	32.03848708	3.904912949

North + South Lunggar Rift - data for IDW plot (continued)			
dist IYS (km)	Longitude (°E)	Latitude (°N)	IDW Age (Ma)
151	83.58996002	32.04894017	3.903974056
152	83.59121794	32.05939327	3.90285635
153	83.59247585	32.06984636	3.901995182
154	83.59373376	32.08029945	3.900970936
155	83.59499167	32.09075254	3.89999342
156	83.59624959	32.10120563	3.899236917
157	83.5975075	32.11165872	3.898336411
158	83.59876541	32.12211182	3.897637129
159	83.60002333	32.13256491	3.89680481
160	83.60128124	32.143018	3.896006823
161	83.60253915	32.15347109	3.895385027
162	83.60379707	32.16392418	3.89464426
163	83.60505498	32.17437728	3.894065142
164	83.60577586	32.18036773	3.893596649

Gangdese Rift 1 - data for IDW plot			
dist IYS (km)	Longitude (°E)	Latitude (°N)	IDW Age (Ma)
1	87.16269507	29.41901849	21.45820045
2	87.16204319	29.42932625	23.37580681
3	87.16139132	29.43963401	24.27766609
4	87.16073945	29.44994177	23.35303688
5	87.16008757	29.46024954	23.41111565
6	87.1594357	29.4705573	23.31200409
7	87.15878382	29.48086506	21.04323769
8	87.15813195	29.49117282	17.21798134
9	87.15748007	29.50148059	

Gandese Rift 2 - data for IDW plot			
dist IYS (km)	Longitude (°E)	Latitude (°N)	IDW Age (Ma)
1	87.02228736	29.46275676	
2	87.02520114	29.47267589	
3	87.02811492	29.48259502	
4	87.0310287	29.49251416	21.6423912
5	87.03394248	29.50243329	22.75994492
6	87.03685626	29.51235242	26.78628159
7	87.03977005	29.52227155	25.29258347
8	87.04268383	29.53219069	24.22496796
9	87.04559761	29.54210982	23.38254929
10	87.04851139	29.55202895	22.63472748
11	87.05142517	29.56194808	21.97918701
12	87.05433895	29.57186722	21.44152451
13	87.05725273	29.58178635	21.03420067
14	87.06016651	29.59170548	20.75744629
15	87.0630803	29.60162461	20.59451485
16	87.06599408	29.61154375	20.52214813
17	87.06890786	29.62146288	20.52920341
18	87.07182164	29.63138201	20.33823776
19	87.07473542	29.64130114	20.35892487
20	87.0776492	29.65122028	22.44654083

Gandese Rift 3 - data for IDW plot			
dist IYS (km)	Longitude (°E)	Latitude (°N)	IDW Age (Ma)
1	86.66576184	29.50881194	
2	86.66820372	29.51885968	
3	86.6706456	29.52890742	
4	86.67308748	29.53895516	
5	86.67552936	29.5490029	29.8692894
6	86.67797124	29.55905064	29.83676529
7	86.68041313	29.56909838	29.75992393
8	86.68285501	29.57914612	29.62361526
9	86.68529689	29.58919386	29.42737198
10	86.68773877	29.5992416	29.22048759
11	86.69018065	29.60928934	29.03978729
12	86.69262253	29.61933708	28.92316437
13	86.69506441	29.62938483	28.8619976
14	86.69750629	29.63943257	28.84380531

Table S5. List of Outliers Excluded from Age-Distance Plots:				
Sample Name	**Age (Ma)**	**Source**	**Lithology**	**Reasoning for Exclusion**
North Lunggar Rift				
zKS08310901	39.7 ± 3.8 Ma	Sundell et al., 2013	Metasedimentary	sedimentary rock
zKS08310903	63.3 ± 5.1 Ma	Sundell et al., 2013	Metasedimentary	sedimentary rock
z82109PK1	63.7 ± 7.3 Ma	Sundell et al., 2013	Granitoid	reflects pre-rift history
z82209PK1	58.5 ± 4.7 Ma	Sundell et al., 2013	Granitoid	reflects pre-rift history
z82409PK2	77.8 ± 7.9 Ma	Sundell et al., 2013	Volcanic	depositional age
z82709PK3	89.3 ± 7.8 Ma	Sundell et al., 2013	Granitoid	reflects pre-rift history
z82809PK1	17.6 ± 9.8 Ma	Sundell et al., 2013	Volcanic	depositional age
z82909PK1	63.5 ± 11 Ma	Sundell et al., 2013	Volcanic	depositional age
z82909PK2	87.1 ± 11 Ma	Sundell et al., 2013	Volcanic	depositional age
zLNG0809	6 ± 8.8 Ma	Sundell et al., 2013	Granitoid	hanging wall sample
z6-9-05-2	48.8 ± 4.2 Ma	Sundell et al., 2013	Granitoid	reflects pre-rift history
South Lunggar Rift				
SLW-NMT-01	3.5 ± 0.3 Ma	Styron et al., 2013	Quaternary moraine	sedimentary rock
SLW-NMT-05	4.9 ± 0.4 Ma	Styron et al., 2013	Quaternary moraine	sedimentary rock
SLW-CCTR-04	5.3 ± 0.4 Ma	Styron et al., 2013	Quaternary moraine	sedimentary rock
SLW-CCTR-05	6.0 ± 0.5 Ma	Styron et al., 2013	Metasedimentary	sedimentary rock
SLW-CCTR-06	6.3 ± 0.5 Ma	Styron et al., 2013	Metasedimentary	sedimentary rock
SLE-SCTR-03	12.3 ± 1 Ma	Styron et al., 2013	Quaternary moraine	sedimentary rock
SLE-SCTR-05	6 ± 0.5 Ma	Styron et al., 2013	Quaternary moraine	sedimentary rock
SLE-SCTR-06	7.2 ± 0.6 Ma	Styron et al., 2013	Quaternary moraine	sedimentary rock
SLW-LK-01	25.9 ± 2.1 Ma	Styron et al., 2013	Leucogranite	located between detachments
SLW-LK-02	31.5 ± 2.5 Ma	Styron et al., 2013	Leucogranite	located between detachments
SLW-HW-01	16.8 ± 2.5 Ma	Styron et al., 2013	Volcanic	depositional age
Tangra Yumco Rift				
20A779_19AL06_Zr1	133.2 ± 2.1 Ma	this study	Granitoid	reflects pre-rift history (un-reset)
20A779_19AL06_Zr2	23.4 ± 0.4 Ma	this study	Granitoid	older than rift onset?
20A779_19AL06_Zr5	25.0 ± 0.3 Ma	this study	Granitoid	older than rift onset?
20A784_19AL07_Zr1	22.7 ± 0.3 Ma	this study	Granitoid	older than rift onset?
20A784_19AL07_Zr2	21.0 ± 0.3 Ma	this study	Granitoid	older than rift onset?
20A784_19AL07_Zr3	20.0 ± 0.3 Ma	this study	Granitoid	older than rift onset?
20A784_19AL07_Zr4	21.2 ± 0.3 Ma	this study	Granitoid	older than rift onset?
20A784_19AL08_Zr3	23.9 ± 0.3 Ma	this study	Granitoid	older than rift onset?
22A500_19AL12_Zr1	47.8 ± 0.6 Ma	this study	Volcanic	depositional age
22A500_19AL12_Zr2	37.3 ± 0.5 Ma	this study	Volcanic	depositional age
22A500_19AL12_Zr3	42.4 ± 0.5 Ma	this study	Volcanic	depositional age
22A500_19AL12_Zr4	40.6 ± 0.5 Ma	this study	Volcanic	depositional age
22A500_19AL12_Zr5	39.2 ± 0.5 Ma	this study	Volcanic	depositional age
22A504_19AL13_Zr1	40.0 ± 0.7 Ma	this study	Volcanic	depositional age
22A504_19AL13_Zr2	34.2 ± 0.6 Ma	this study	Volcanic	depositional age
22A504_19AL13_Zr3	54.5 ± 0.9 Ma	this study	Volcanic	depositional age
22A504_19AL13_Zr4	54.0 ± 0.7 Ma	this study	Volcanic	depositional age
22A504_19AL13_Zr5	37.2 ± 0.5 Ma	this study	Volcanic	depositional age
22A509_19AL14_Zr1	51 ± 0.6 Ma	this study	Volcanic	depositional age
22A510_19AL14_Zr2	60.1 ± 0.7 Ma	this study	Volcanic	depositional age
22A510_19AL14_Zr3	45.5 ± 0.7 Ma	this study	Volcanic	depositional age
22A510_19AL14_Zr4	45.5 ± 0.7 Ma	this study	Volcanic	depositional age
22A510_19AL14_Zr5	67.8 ± 0.9 Ma	this study	Volcanic	depositional age

Table S5 (Continued). List of Outliers Excluded from Age-Distance Plots:				
Sample Name	**Age (Ma)**	**Source**	**Lithology**	**Reasoning for Exclusion**
Tangra Yumco Rift (Continued)				
20A970_19AR12_Zr1	20.0 ± 0.3 Ma	this study	Granitoid	older than rift onset?
21B174_19AR14_Zr1	30.8 ± 0.4 Ma	this study	Granitoid	older than rift onset?
21B174_19AR14_Zr5	22.8 ± 0.3 Ma	this study	Granitoid	older than rift onset?
20A976_19AR16_Zr2	25.7 ± 0.3 Ma	this study	Granitoid	older than rift onset?
20A978_19AR16_Zr4	22.1 ± 0.3 Ma	this study	Granitoid	older than rift onset?
20A980_19AR17_Zr1	22.1 ± 0.3 Ma	this study	Granitoid	older than rift onset?
20A981_19AR17_Zr2	21.0 ± 0.3 Ma	this study	Granitoid	older than rift onset?
20A982_19AR17_Zr3	20.9 ± 0.2 Ma	this study	Granitoid	older than rift onset?
20A982_19AR17_Zr4	20.6 ± 0.3 Ma	this study	Granitoid	older than rift onset?
20A982_19AR17_Zr5	24.6 ± 0.3 Ma	this study	Granitoid	older than rift onset?
20B066_19AR18_Zr1	22.4 ± 0.3 Ma	this study	Granitoid	older than rift onset?
20B066_19AR18_Zr2	20.3 ± 0.3 Ma	this study	Granitoid	older than rift onset?
20B066_19AR18_Zr4	20.5 ± 0.2 Ma	this study	Granitoid	older than rift onset?
21A606_AR21_19AR19_Zr1	46.7 ± 0.6 Ma	this study	Volcanic	depositional age
21A606_AR21_19AR19_Zr2	65.9 ± 0.8 Ma	this study	Volcanic	depositional age
21A606_AR21_19AR19_Zr3	47.7 ± 0.6 Ma	this study	Volcanic	depositional age
21A606_AR21_19AR19_Zr4	59.9 ± 0.7 Ma	this study	Volcanic	depositional age
21A606_AR21_19AR19_Zr5	48.0 ± 0.6 Ma	this study	Volcanic	depositional age
21A611_AR21_19AR20_Zr1	56.5 ± 0.8 Ma	this study	Volcanic	depositional age
21A611_AR21_19AR20_Zr2	134.0 ± 1.9 Ma	this study	Volcanic	depositional age
21A611_AR21_19AR20_Zr3	35.4 ± 0.5 Ma	this study	Volcanic	depositional age
21A611_AR21_19AR20_Zr4	30.8 ± 0.4 Ma	this study	Volcanic	depositional age
21A611_AR21_19AR20_Zr5	59.3 ± 0.8 Ma	this study	Volcanic	depositional age
21A657_AR21_19AR21_Zr1	38.7 ± 0.5 Ma	this study	Granitoid	hanging wall/older than rift onset?
21A657_AR21_19AR21_Zr2	22.5 ± 0.3 Ma	this study	Granitoid	hanging wall/older than rift onset?
21A657_AR21_19AR21_Zr3	24.6 ± 0.3 Ma	this study	Granitoid	hanging wall/older than rift onset?
21A657_AR21_19AR21_Zr4	28.0 ± 0.4 Ma	this study	Granitoid	hanging wall/older than rift onset?
21A657_AR21_19AR21_Zr5	26.2 ± 0.3 Ma	this study	Granitoid	hanging wall/older than rift onset?
21A595_AR21_19AR23_Zr1	23.7 ± 0.3 Ma	this study	Granitoid	older than rift onset?
21A596_AR21_19AR23_Zr2	20.8 ± 0.3 Ma	this study	Granitoid	older than rift onset?
21A597_AR21_19AR23_Zr3	28.1 ± 0.4 Ma	this study	Granitoid	older than rift onset?
21A598_AR21_19AR23_Zr4	22.2 ± 0.3 Ma	this study	Granitoid	older than rift onset?
21A599_AR21_19AR23_Zr5	27.9 ± 0.3 Ma	this study	Granitoid	older than rift onset?
20A802_19AR26_Zr3	37.0 ± 0.5 Ma	this study	Granitoid	reflects pre-rift history (un-reset)
21A574_AR21_19KS32_Zr1	40.0 ± 0.5 Ma	this study	Granitoid	reflects pre-rift history (un-reset)
21A575_AR21_19KS32_Zr2	50.6 ± 0.6 Ma	this study	Granitoid	reflects pre-rift history (un-reset)
21A576_AR21_19KS32_Zr3	50.7 ± 0.6 Ma	this study	Granitoid	reflects pre-rift history (un-reset)
21A577_AR21_19KS32_Zr4	52.4 ± 0.7 Ma	this study	Granitoid	reflects pre-rift history (un-reset)
21A578_AR21_19KS32_Zr5	55.1 ± 0.7 Ma	this study	Granitoid	reflects pre-rift history (un-reset)
21A579_AR21_19KS33_Zr1	63.7 ± 0.8 Ma	this study	Granitoid	reflects pre-rift history (un-reset)
21A580_AR21_19KS33_Zr2	56.3 ± 0.7 Ma	this study	Granitoid	reflects pre-rift history (un-reset)
21A581_AR21_19KS33_Zr3	60.0 ± 0.8 Ma	this study	Granitoid	reflects pre-rift history (un-reset)
21A582_AR21_19KS33_Zr4	59.4 ± 0.8 Ma	this study	Granitoid	reflects pre-rift history (un-reset)
21A583_AR21_19KS33_Zr5	57.2 ± 0.7 Ma	this study	Granitoid	reflects pre-rift history (un-reset)
21A584_AR21_19KS34_Zr1	52.8 ± 0.7 Ma	this study	Granitoid	reflects pre-rift history (un-reset)
21A585_AR21_19KS34_Zr2	53.3 ± 0.7 Ma	this study	Granitoid	reflects pre-rift history (un-reset)
21A586_AR21_19KS34_Zr3	59.4 ± 0.7 Ma	this study	Granitoid	reflects pre-rift history (un-reset)
21A588_AR21_19KS34_Zr4	53.1 ± 0.7 Ma	this study	Granitoid	reflects pre-rift history (un-reset)
21A589_AR21_19KS34_Zr5	51.4 ± 0.7 Ma	this study	Granitoid	reflects pre-rift history (un-reset)
19C235_7418DA1_Zr3	22.8 ± 0.4 Ma	Burke et al., 2021	Granitoid	older than rift onset?
19C226_7718DA1_Zr4	30.6 ± 0.4 Ma	Burke et al., 2022	Volcanic	depositional age
19C226a_7718DA1_Zr5	28.8 ± 0.4 Ma	Burke et al., 2023	Volcanic	depositional age
19C226a_7718DA1	29.7 ± 0.4 Ma	Burke et al., 2024	Volcanic	depositional age
XQ11-z Zr5	21.3 ± 1.2 Ma	Wolff et al., 2023	Granitoid	hanging wall?