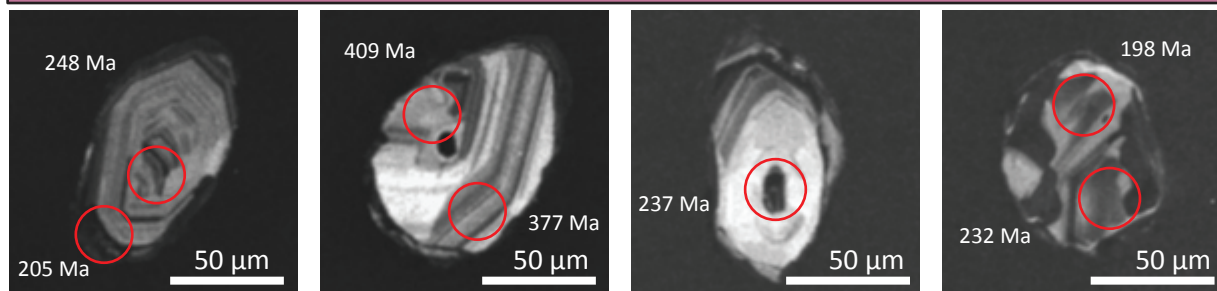
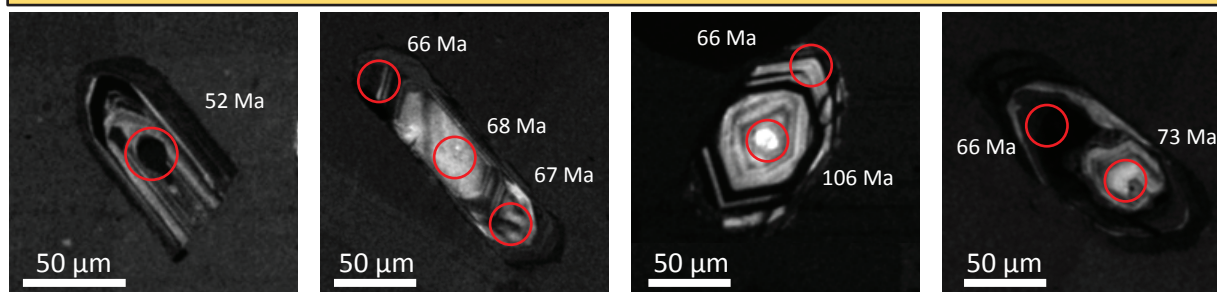


Supplemental Figure S1: Representative CL images for zircon grains from each sample. Red circles are LA-ICPMS locations and associated $^{206}\text{Pb}/^{238}\text{U}$ (if <1.0 Ga) or $^{207}\text{Pb}/^{206}\text{Pb}$ (if >1.0 Ga) dates.

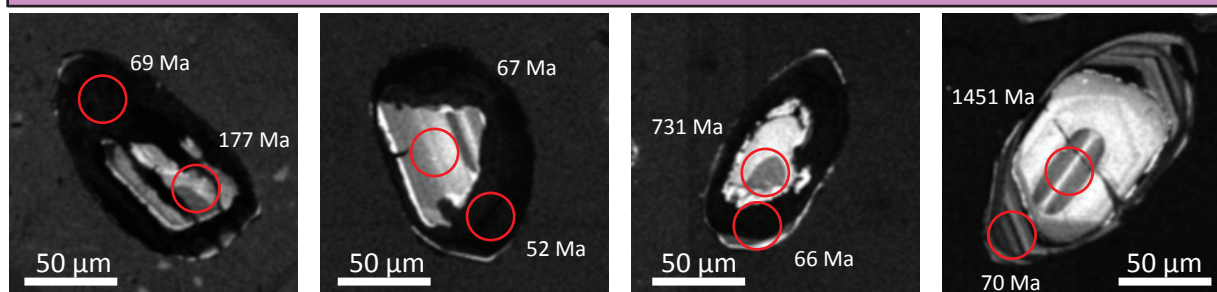
SK19-32: southern Ruby Mountain (Group 1)



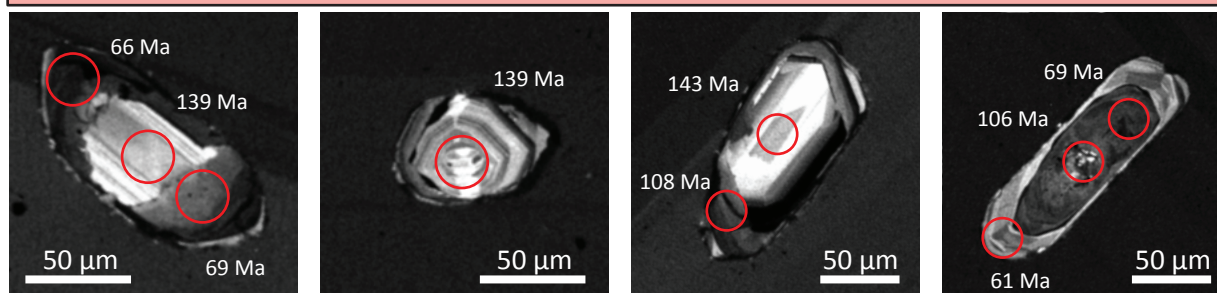
SK19-55: Red Mountain (Group 1)



SK19-112: near Colonial Glacier (Group 1)

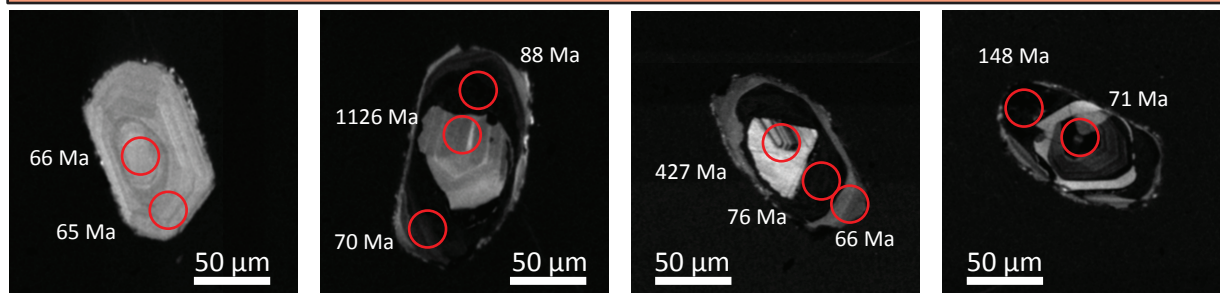


SK19-159: western Red Mountain (Group 1)

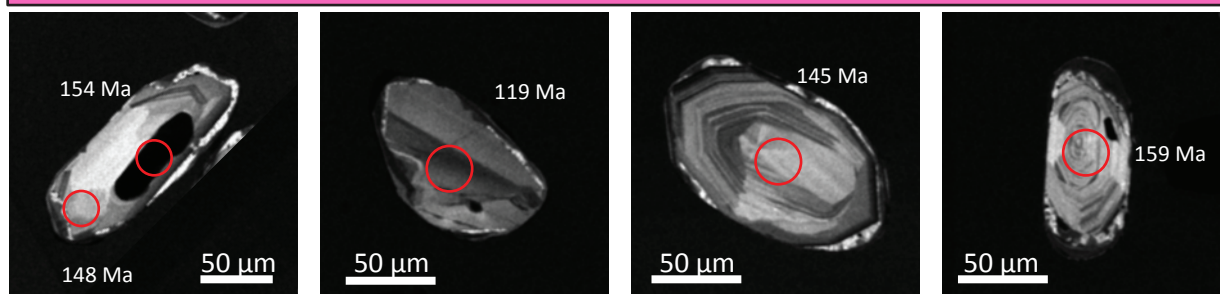


Supplemental Figure S1 Continued: Representative CL images for zircon grains from each sample. Red circles are LA-ICPMS locations and associated $^{206}\text{Pb}/^{238}\text{U}$ (if <1.0 Ga) or $^{207}\text{Pb}/^{206}\text{Pb}$ (if >1.0 Ga) dates.

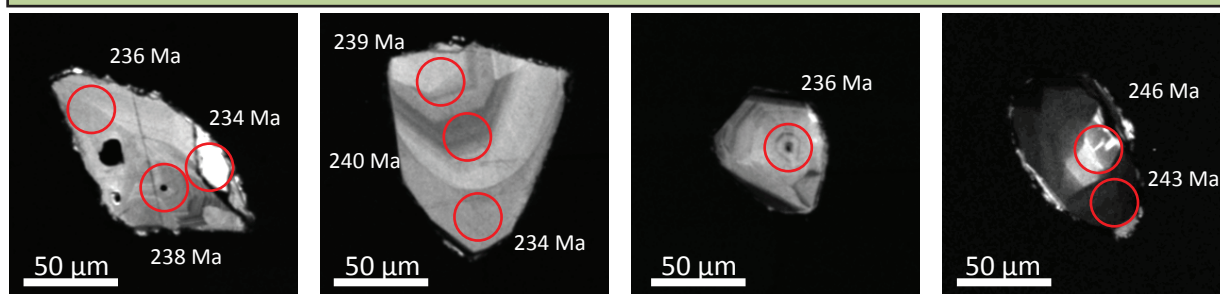
SK06-1C: Gorge Lake (Group 1)



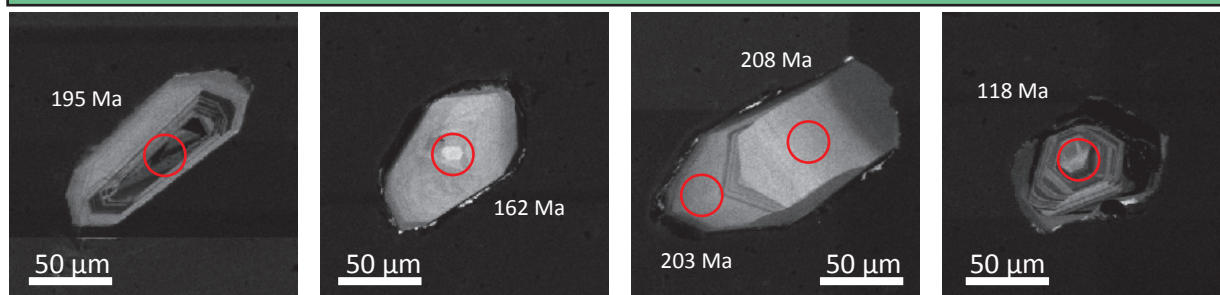
SK19-123: southern Diablo Lake (Group 2)



SK19-09B: Elijah Ridge (Group 3)

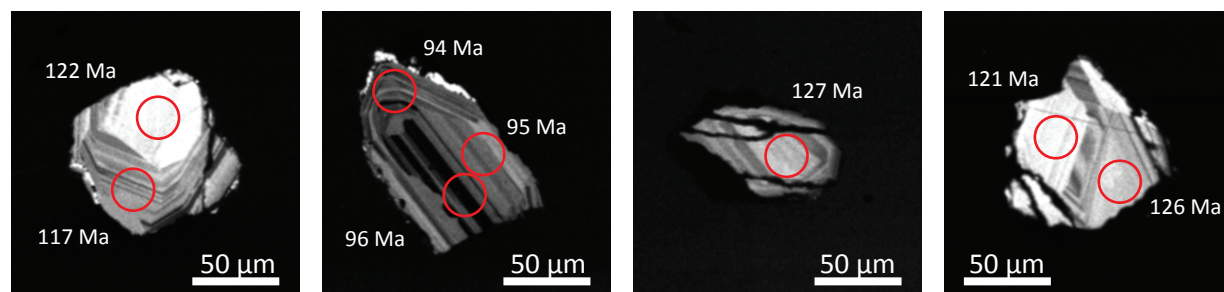


SK19-07: Elijah Ridge (Group 3)

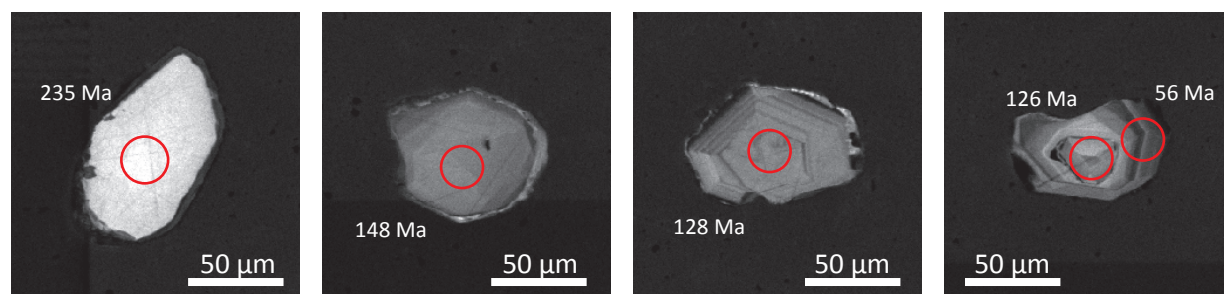


Supplemental Figure S1 Continued: Representative CL images for zircon grains from each sample. Red circles are LA-ICPMS locations and associated $^{206}\text{Pb}/^{238}\text{U}$ (if <1.0 Ga) or $^{207}\text{Pb}/^{206}\text{Pb}$ (if >1.0 Ga) dates.

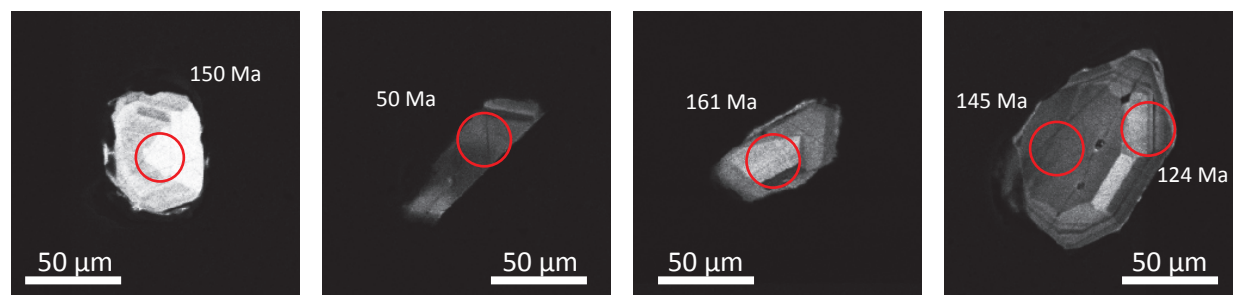
SK19-15C: Gabriel Creek (Group 3)



SK19-20: Ruby Creek (Group 3)



SK19-20 Clasts: Ruby Creek (Group 3)



Supplemental Text S1: Whole Rock Major- and Trace-Element Geochemistry

Whole rock major- and trace-element geochemistry was determined for 15 samples. Four samples were analyzed by Activation Laboratories Ltd. in Ontario, Canada. Representative portions from each sample underwent lithium metaborate/tetraborate fusion, followed by digestion with a weak nitric acid. Major-elements were measured using inductively coupled plasma optical emission spectrometry and the trace-elements were measured using ICP-MS. Eleven samples were analyzed at Pomona College following the procedure from Lackey et al. (2012). Representative portions of each sample were powdered and mixed at a 1:2 ratio with dilithium tetraborate (3.5 g powder with 7.0 g dilithium tetraborate). The mixture was fused into a glass bead in a graphite crucible, reground, and then fused a second time. The glass beads were subsequently polished. Major elements were analyzed using a 3.0 kW Panalytical Axios wavelength-dispersive XRF spectrometer, and trace elements were analyzed using an Agilent 8900 triple quadrupole ICP-MS with a ESI NWR 193 nm laser ablation system. Concentrations were determined using reference calibration curves calculated from 55 reference materials.

Supplemental Text S2: Chemical Analyses of Rutile

For rutile analyses, Zr $\text{L}\alpha$ was acquired on three spectrometers simultaneously (1 PETJ crystal and 2 PETL crystals) for a total of 106 seconds on-peak and 192 seconds off-peak. The intensities were aggregated using Probe for EPMA software (Probe Software, Inc; Donovan et al., 2012). Ti $\text{K}\alpha$ was acquired on PETL for 8 s on peak and 8 s off peak. A linear background fit was utilized for Ti $\text{K}\alpha$, and exponential background fits were utilized for Zr $\text{L}\alpha$ (Donovan et al., 2011). Measurements of Nb, Fe, and Cr were performed on a few randomly-selected grains. Low concentrations of <1200 ppm for Nb, <900 ppm for Fe, and <700 ppm for Cr were concluded to not significantly influence the rutile and were therefore, not measured (Zach et al., 2004).

SUPPLEMENTAL TABLE S1. Measurement Method for LA-ICPMS U-Pb data

Laboratory and Sample Preparation	
Laboratory Name	University of California, Santa Barbara
Sample type/mineral	Detrital zircons, metamorphic mantle and rims
Sample preparation	Standard mineral-separation techniques, mounted in 1-inch epoxy rounds, and polished to expose the approximate center of the grains; entire zircon population from each sample was poured and mounted in epoxy in order to not bias age populations.
Imaging	CL images of the zircon were collected at 10 kV and 12 nA on the JEOL JSM-7100FT field emission scanning electron microscope (FE-SEM) at the UNR with a 12 mm working distance.
Laser Ablation System	
Make, Model, Type	Cetac/Photon Machines excimer G1 or Analyte laser
Ablation cell and volume	HelEx cell II
Laser wavelength (nm)	193 nm
Pulse width (ns)	5 ns
Fluence (J cm ⁻²)	~3–4 J cm ⁻²
Repetition Rate (Hz)	4 Hz
Ablation duration (s)	15 s
Ablation pit depth/ablation rate	50–100 nm/pulse
Spot diameter (microns)	25 microns (15 microns for SK19–20 clasts)
Sampling mode/pattern	Static spot ablation
Carrier gas	He carrier gas; mixed with Ar in a mixing bulb
Cell carrier gas flow (l min ⁻¹)	0.15 l/m
ICP-MS Instrument	
Make, Model, Type	Nu Plasma II MC-ICP-MS
Sample Introduction	Laser Ablation
RF Power (W)	1300
Make-up gas flow (l min ⁻¹)	~1 l/m
Detection System	Faraday–IC
Masses measured	204, 206, 207, 208, 232, 238
Integration time per peak/dwell times (ms)	0.5 s
Total integration time per output data point (s)	0.5 s
Sensitivity ^a as useful yield (%; element)	0.5% U
IC Dead time (ns)	~8 ns
Data Processing	
Gas blank	U, Th: b.d.; Pb: <500cps; 204Hg: <200 cps
Calibration strategy	91500 used as calibration (primary) reference material, multiple RMs used as validation (secondary) reference material
Reference Material Information	91500 (Wiedenback et al., 1995), GJ1 (Jackson et al., 2004)
Data processing package used/Correction for LIEF	Nu Instruments Nu Plasma TRA software and Iolite v.3
Mass discrimination	Not applicable; mass discrimination and IC gain are not distinguished
Common-Pb correction, composition and uncertainty	No common-Pb correction applied to data
Uncertainty level and propaation	Data was reduced using Iolite v3 or v4 (Paton et al., 2010). Uncertainties were calculated using a least squares method of the error given in Iolite and extra error was added based on whether all the individual ratios and ages of the validation (secondary) reference material revealed a single population assessed by the mean square weighted deviation (MSWD). If they did not, the extra uncertainty required to make the ratio or age measurements a single population was added to all of the unknown measurements.
Quality Control/Validation	2019 Run1: GJ1 – Wtd ave $^{206}\text{Pb}/^{238}\text{U}$ age = 601 ± 3 (2s, MSWD = 12*, n = 19) 2019 Run2: GJ1 – Wtd ave $^{206}\text{Pb}/^{238}\text{U}$ age = 604 ± 3 (2s, MSWD = 7.5*, n = 16) 2020 Run1: GJ1 – Wtd ave $^{206}\text{Pb}/^{238}\text{U}$ age = 606 ± 2 (2s, MSWD = 0.47, n = 20) 2020 Run2: GJ1 – Wtd ave $^{206}\text{Pb}/^{238}\text{U}$ age = 604 ± 2 (2s, MSWD = 0.71, n = 18) 2020 Run3: GJ1 – Wtd ave $^{206}\text{Pb}/^{238}\text{U}$ age = 600 ± 2 (2s, MSWD = 1.02, n = 28) 2020 Run4: GJ1 – Wtd ave $^{206}\text{Pb}/^{238}\text{U}$ age = 600 ± 2 (2s, MSWD = 1.09, n = 21) 2020 Run5: GJ1 – Wtd ave $^{206}\text{Pb}/^{238}\text{U}$ age = 609 ± 2 (2s, MSWD = 0.37, n = 18) *error uncertainty was added to runs with a high MSWD

SUPPLEMENTAL TABLE S2. Measurement Method for LA-ICPMS U-Pb data

Laboratory and Sample Preparation	
Laboratory Name	University of Nevada, Reno
Sample type/mineral	Detrital zircons
Sample preparation	Standard mineral-separation techniques, mounted in 1-inch epoxy rounds, and polished to expose the approximate center of the grains; entire zircon population from each sample was poured and mounted in epoxy in order to not bias age populations.
Imaging	CL images of the zircon were collected at 10 kV and 12 nA on the JEOL JSM-7100FT field emission scanning electron microscope (FE-SEM) at the UNR with a 12 mm working distance.
Laser Ablation System	
Make, Model, Type	Resonetics RESolution M-50 E (ATL laser)
Ablation cell and volume	Laurin Technic M-50A dual volume
Laser wavelength (nm)	Excimer, 193 nm
Pulse width (ns)	20 ns
Fluence (J cm^{-2})	$\sim 3\text{--}4 \text{ J cm}^{-2}$
Repetition Rate (Hz)	7 Hz
Ablation duration (s)	30 s
Ablation pit depth/ablation rate	$\sim 10\text{--}12 \text{ }\mu\text{m}$
Spot diameter (microns)	25 μm
Sampling mode/pattern	Static spot ablation
Carrier gas	He carrier gas mixed with N_2 for increased sensitivity
Cell carrier gas flow (l min^{-1})	0.85 L/min (He), 0.0045 L/min (N_2)
ICP-MS Instrument	
Make, Model, Type	Agilent 7700 quadrupole ICP-MS
Sample Introduction	dry plasma
RF Power (W)	1350 W
Make-up gas flow (l min^{-1})	0.85 L/min
Detection System	Pulse mode
Masses measured	204, 206, 207, 208, 232, 238
Integration time per peak/dwell times (ms)	0.01 s for ^{208}Pb ; 0.025 s for ^{232}Th ; 0.04 s for ^{238}U and ^{204}Pb ; 0.08 s for ^{206}Pb ; and 0.11 s for ^{207}Pb
Total integration time per output data point (s)	0.305 sec
Sensitivity' as useful yield (% , element)	N/A
IC Dead time (ns)	N/A
Data Processing	
Gas blank	N/A
Calibration strategy	91500 used as calibration (primary) reference material, Plešovice used as validation (secondary) reference material
Reference Material Information	91500 (Wiedenback et al., 1995), Plešovice (Sláma et al., 2008)
Data processing package used/Correction for LIEF	MassHunter v.4.5 time resolved analysis mode and Iolite v3/4
Mass discrimination	Standard sample bracketing wrt to primary reference material
Common-Pb correction, composition and uncertainty	N/A
Uncertainty level and propaation	Data was reduced using Iolite v3 or v4 (Paton et al., 2010). Uncertainties were calculated using a least squares method of the error given in Iolite and extra error was added based on whether all the individual ratios and ages of the validation (secondary) reference material revealed a single population assessed by the mean square weighted deviation (MSWD). If they did not, the extra uncertainty required to make the ratio or age measurements a single population was added to all of the unknown measurements.
Quality Control/Validation	2019 Run1: Plešovice – Wtd ave $^{206}\text{Pb}/^{238}\text{U}$ age = 339 ± 4 (2s, MSWD = 1.6, n = 19) 2019 Run2: Plešovice – Wtd ave $^{206}\text{Pb}/^{238}\text{U}$ age = 360 ± 22 (2s, MSWD = 2.7, n = 13) 2019 Run3: Plešovice – Wtd ave $^{206}\text{Pb}/^{238}\text{U}$ age = 338 ± 4 (2s, MSWD = 0.71, n = 21)

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ. [†]	Name [‡]	Zr # [‡]	loc.	f206c	²⁰⁶ Pb CPS	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ U	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK19-32	2019	UNR	Run 1	1	core	N/A	N/A	369	2	N/A	44.643	4.9	0.060	15.1	0.174	13.8	0.022	4.9	0.02	460.0	270.0	270.0	142.6	6.8	6.8	159.0	21.0	21.0	90	142.6	6.8	6.8
SK19-32	2019	UNR	Run 1	2	core	N/A	N/A	103	2	N/A	25.253	6.1	0.060	20.0	0.319	19.1	0.040	6.1	0.20	390.0	360.0	360.0	250.0	15.0	15.0	276.0	48.0	48.0	91	250.0	15.0	15.0
SK19-32	2019	UNR	Run 1	3	core	N/A	N/A	203	1	N/A	40.000	6.8	0.050	19.8	0.168	19.6	0.025	6.8	0.22	200.0	330.0	330.0	159.0	10.0	10.0	163.0	28.0	28.0	98	159.0	10.0	10.0
SK19-32	2019	UNR	Run 1	4	core	N/A	N/A	561	12	N/A	27.624	5.0	0.092	5.7	0.453	6.4	0.036	5.0	0.51	1440.0	110.0	110.0	229.0	11.0	11.0	376.0	20.0	20.0	61	229.0	11.0	11.0
SK19-32	2019	UNR	Run 1	5	core	N/A	N/A	302	1	N/A	2.674	4.3	0.145	3.8	7.490	4.0	0.374	4.3	0.70	2276.0	66.0	66.0	2049.0	79.0	79.0	2169.0	34.0	34.0	94	2169.0	34.0	34.0
SK19-32	2019	UNR	Run 1	6	core	N/A	N/A	125	3	N/A	40.323	7.7	0.081	25.9	0.287	25.4	0.025	7.7	0.25	690.0	460.0	460.0	158.0	12.0	12.0	233.0	53.0	53.0	68	158.0	12.0	12.0
SK19-32	2019	UNR	Run 1	7	core	N/A	N/A	606	1	N/A	26.882	4.8	0.058	6.9	0.288	6.6	0.037	4.8	0.32	460.0	140.0	140.0	236.0	11.0	11.0	256.0	15.0	15.0	92	236.0	11.0	11.0
SK19-32	2019	UNR	Run 1	8	core	N/A	N/A	386	1	N/A	17.241	6.0	0.056	7.2	0.453	7.7	0.058	6.0	0.38	430.0	160.0	160.0	363.0	21.0	21.0	382.0	23.0	23.0	95	363.0	21.0	21.0
SK19-32	2019	UNR	Run 1	9	core	N/A	N/A	759	1	N/A	25.445	4.6	0.054	6.7	0.285	6.7	0.039	4.6	0.36	350.0	140.0	140.0	248.0	11.0	11.0	255.0	14.0	14.0	97	248.0	11.0	11.0
SK19-32	2019	UNR	Run 1	10	core	N/A	N/A	381	2	N/A	46.104	4.2	0.056	15.4	0.165	15.8	0.022	4.2	0.07	260.0	290.0	290.0	138.3	5.7	5.7	154.0	23.0	23.0	90	138.3	5.7	5.7
SK19-32	2019	UNR	Run 1	11	core	N/A	N/A	139	2	N/A	13.245	6.6	0.076	9.2	0.808	10.6	0.076	6.6	0.47	1150.0	200.0	200.0	468.0	30.0	30.0	594.0	45.0	45.0	79	468.0	30.0	30.0
SK19-32	2019	UNR	Run 1	12	core	N/A	N/A	113	1	N/A	49.261	7.9	0.059	28.8	0.164	28.7	0.020	7.9	0.05	330.0	510.0	510.0	129.0	10.0	10.0	152.0	41.0	41.0	85	129.0	10.0	10.0
SK19-32	2019	UNR	Run 1	13	core	N/A	N/A	1670	10	N/A	71.429	7.9	0.069	9.6	0.130	10.8	0.014	7.9	0.54	800.0	210.0	210.0	89.8	6.9	6.9	123.0	13.0	13.0	73	89.8	6.9	6.9
SK19-32	2019	UNR	Run 1	14	core	N/A	N/A	352	3	N/A	15.244	5.3	0.066	7.9	0.561	8.4	0.066	5.3	0.45	710.0	170.0	170.0	409.0	21.0	21.0	450.0	30.0	30.0	91	409.0	21.0	21.0
SK19-32	2019	UNR	Run 1	15	core	N/A	N/A	437	2	N/A	38.610	5.4	0.114	15.8	0.407	16.0	0.026	5.4	0.41	1620.0	270.0	270.0	164.7	8.7	8.7	331.0	44.0	44.0	50	164.7	8.7	8.7
SK19-32	2019	UNR	Run 1	16	core	N/A	N/A	218	2	N/A	5.345	4.7	0.100	4.8	2.490	6.4	0.187	4.7	0.57	1607.0	91.0	91.0	1104.0	48.0	48.0	1273.0	45.0	45.0	87	1273.0	45.0	45.0
SK19-32	2019	UNR	Run 1	17	core	N/A	N/A	367	1	N/A	22.026	5.7	0.058	7.7	0.357	7.8	0.045	5.7	0.38	520.0	150.0	150.0	286.0	16.0	16.0	310.0	21.0	21.0	92	286.0	16.0	16.0
SK19-32	2019	UNR	Run 1	18	core	N/A	N/A	1331	1	N/A	40.800	3.8	0.057	6.4	0.191	7.3	0.025	3.8	0.41	460.0	140.0	140.0	156.0	5.8	5.8	177.0	12.0	12.0	88	156.0	5.8	5.8
SK19-32	2019	UNR	Run 1	19	core	N/A	N/A	221	2	N/A	43.290	5.6	0.146	12.3	0.437	12.1	0.023	5.6	0.26	2160.0	200.0	200.0	146.9	8.0	8.0	363.0	35.0	35.0	40	146.9	8.0	8.0
SK19-32	2019	UNR	Run 1	20	core	N/A	N/A	449	1	N/A	5.999	4.9	0.109	4.5	2.540	5.5	0.167	4.9	0.61	1777.0	86.0	86.0	991.0	45.0	45.0	1278.0	40.0	40.0	78	991.0	45.0	45.0
SK19-32	2019	UNR	Run 1	21	core	N/A	N/A	617	2	N/A	40.486	5.7	0.057	8.7	0.186	8.6	0.025	5.7	0.30	410.0	190.0	190.0	157.4	8.7	8.7	174.0	15.0	15.0	90	157.4	8.7	8.7
SK19-32	2019	UNR	Run 1	22	core	N/A	N/A	443	2	N/A	3.690	4.4	0.114	3.6	4.220	4.5	0.271	4.4	0.62	1847.0	64.0	64.0	1563.0	65.0	65.0	1674.0	35.0	35.0	93	1674.0	35.0	35.0
SK19-32	2019	UNR	Run 1	23	core	N/A	N/A	366	1	N/A	40.000	5.6	0.053	12.5	0.182	13.2	0.025	5.6	0.23	260.0	240.0	240.0	158.9	8.7	8.7	167.0	20.0	20.0	95	158.9	8.7	8.7
SK19-32	2019	UNR	Run 1	24	core	N/A	N/A	161	1	N/A	3.610	6.5	0.133	6.0	4.890	5.9	0.277	6.5	0.65	2158.0	99.0	99.0	1570.0	92.0	92.0	1788.0	49.0	49.0	88	1788.0	49.0	49.0
SK19-32	2019	UNR	Run 1	25	core	N/A	N/A	236	2	N/A	37.879	6.1	0.051	15.2	0.177	14.7	0.026	6.1	0.12	180.0	290.0	290.0	168.0	10.0	10.0	165.0	23.0	23.0	102	168.0	10.0	10.0
SK19-32	2019	UNR	Run 1	26	core	N/A	N/A	529	1	N/A	35.461	4.3	0.061	10.9	0.234	11.1	0.028	4.3	0.23	530.0	230.0	230.0	179.1	7.3	7.3	210.0	21.0	21.0	85	179.1	7.3	7.3
SK19-32	2019	UNR	Run 1	27	core	N/A	N/A	376	2	N/A	12.255	3.9	0.072	7.0	0.767	7.0	0.082	3.9	0.43	910.0	150.0	150.0	505.0	19.0	19.0	581.0	31.0	31.0	87	505.0	19.0	19.0
SK19-32	2019	UNR	Run 1	28	core	N/A	N/A	320	1	N/A	39.216	5.9	0.055	13.2	0.180	12.8	0.026	5.9	0.07	330.0	250.0	250.0	162.2	9.5	9.5	165.0	20.0	20.0	98	162.2	9.5	9.5
SK19-32	2019	UNR	Run 1	29	core	N/A	N/A	482	5	N/A	12.739	7.5	0.092	6.8	0.977	7.1	0.079	7.5	0.66	1500.0	130.0	130.0	486.0	35.0	35.0	694.0	34.0	34.0	70	486.0	35.0	35.0
SK19-32	2019	UNR	Run 1	30	core	N/A	N/A	615	2	N/A	24.331	4.4	0.066	8.2	0.373	9.7	0.041	4.4	0.44	720.0	170.0	170.0	259.0	11.0	11.0	317.0	26.0	26.0	82	259.0	11.0	11.0
SK19-32	2019	UNR	Run 1	31	core	N/A	N/A	243	2	N/A	48.544	5.8	0.102	17.6	0.283	17.7	0.021	5.8	0.25	1310.0	350.0	350.0	131.1	7.7	7.7	241.0	38.0	38.0	54	131.1	7.7	7.7
SK19-32	2019	UNR	Run 1	32	core	N/A	N/A	177	2	N/A	43.668	6.1	0.082	15.9	0.261	16.5	0.023	6.1	0.16	1000.0	340.0	340.0	145.6	8.9	8.9	226.0	35.0	35.0	64	145.6	8.9	8.9
SK19-32	2019	UNR	Run 1	33	core	N/A	N/A	453	2	N/A	37.453	6.0	0.090	12.2	0.361	15.5	0.027	6.0	0.51	1480.0	260.0	260.0	170.0	10.0	10.0	302.0	40.0	40.0	56	170.0	10.0	10.0
SK19-32	2019	UNR	Run 1																													

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ.*	Name [‡]	Zr # [‡]	loc.	f206c	²⁰⁶ Pb CPS	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK19-32	2020	UCSB	Run 1	47	rim	N/A	N/A	465	37	N/A	99.206	3.1	0.052	1.9	0.071	3.7	0.010	3.1	0.89	261.0	45.0	45.7	64.6	2.0	2.0	69.6	2.5	2.5	93	64.6	2.0	2.0
SK19-32	2020	UCSB	Run 1	48	rim	N/A	N/A	77	1	N/A	14.859	1.5	0.056	2.0	0.518	1.9	0.067	1.5	0.36	451.0	43.0	45.1	419.9	6.1	6.1	423.9	6.7	6.7	99	419.9	6.1	6.1
SK19-32	2020	UCSB	Run 1	49	rim	N/A	N/A	545	5	N/A	13.986	4.9	0.071	0.8	0.695	4.7	0.072	4.9	0.99	947.0	16.0	32.6	445.0	21.0	21.0	535.0	20.0	20.0	83	445.0	21.0	21.0
SK19-32	2020	UCSB	Run 1	44	rim	N/A	N/A	646	2	N/A	32.154	3.2	0.050	1.1	0.213	3.5	0.031	3.2	0.94	186.0	26.0	26.6	197.7	6.4	6.4	196.4	6.3	6.3	101	197.7	6.4	6.4
SK19-32	2020	UCSB	Run 1	43	rim	N/A	N/A	1141	19	N/A	19.881	2.8	0.054	0.8	0.374	2.6	0.050	2.8	0.95	381.0	18.0	21.3	316.4	8.3	8.3	322.4	7.3	7.3	98	316.4	8.3	8.3
SK19-55	2019	UNR	Run 2	1	core	N/A	N/A	1577	7	N/A	82.737	18.6	0.051	9.8	0.072	9.5	0.012	18.6	-0.15	708.9	179.5	237.8	77.2	14.3	14.3	70.1	6.5	6.5	110	77.2	14.3	14.3
SK19-55	2019	UNR	Run 2	2	core	N/A	N/A	188	1	N/A	43.831	16.3	0.055	18.0	0.172	18.7	0.023	16.3	0.14	1138.3	231.2	340.8	144.8	23.3	23.3	155.0	27.6	27.6	93	144.8	23.3	23.3
SK19-55	2019	UNR	Run 2	3	core	N/A	N/A	573	7	N/A	119.251	14.7	0.078	13.4	0.110	13.5	0.008	14.7	-0.05	1282.9	195.2	343.2	53.8	7.9	7.9	104.5	13.6	13.6	51	53.8	7.9	7.9
SK19-55	2019	UNR	Run 2	4	core	N/A	N/A	369	5	N/A	112.566	14.3	0.061	27.0	0.075	24.4	0.009	14.3	0.01	1310.7	335.9	442.7	57.0	8.1	8.1	71.9	17.1	17.1	79	57.0	8.1	8.1
SK19-55	2019	UNR	Run 2	5	core	N/A	N/A	172	17	N/A	60.327	17.7	0.077	26.6	0.150	30.1	0.017	17.7	0.41	1686.7	352.5	511.8	105.7	18.5	18.5	133.7	37.9	37.9	79	105.7	18.5	18.5
SK19-55	2019	UNR	Run 2	6	core	N/A	N/A	1071	77	N/A	82.426	18.5	0.050	12.1	0.076	11.4	0.012	18.5	0.12	808.2	173.0	248.1	77.5	14.2	14.2	75.3	8.7	8.7	103	77.5	14.2	14.2
SK19-55	2019	UNR	Run 2	7	core	N/A	N/A	140	3	N/A	101.117	16.6	0.075	37.3	0.088	36.1	0.010	16.6	0.03	1861.2	375.0	555.2	63.3	10.5	10.5	79.8	29.3	29.3	79	63.3	10.5	10.5
SK19-55	2019	UNR	Run 2	8	core	N/A	N/A	1249	18	N/A	101.976	13.2	0.051	11.9	0.081	12.9	0.010	13.2	-0.10	871.0	145.0	240.3	62.8	8.3	8.3	78.7	9.8	9.8	80	62.8	8.3	8.3
SK19-55	2019	UNR	Run 2	9	core	N/A	N/A	879	5	N/A	124.686	17.1	0.044	18.2	0.078	17.2	0.008	17.1	-0.07	572.6	206.2	241.7	51.5	8.8	8.8	75.6	12.5	12.5	68	51.5	8.8	8.8
SK19-55	2019	UNR	Run 2	10	core	N/A	N/A	343	1	N/A	16.242	16.2	0.073	13.0	0.680	15.5	0.062	16.2	0.52	1075.0	224.9	326.3	383.7	60.8	60.8	516.9	60.3	60.3	74	383.7	60.8	60.8
SK19-55	2019	UNR	Run 2	11	core	N/A	N/A	2271	90	N/A	146.853	8.5	0.055	10.2	0.088	11.6	0.007	8.5	0.37	641.1	154.9	209.5	43.7	3.7	3.7	85.7	9.5	9.5	51	43.7	3.7	3.7
SK19-55	2019	UNR	Run 2	12	core	N/A	N/A	372	2	N/A	78.853	8.3	0.062	15.5	0.174	13.3	0.013	8.3	-0.27	907.1	233.4	307.1	81.2	6.8	6.8	161.2	20.0	20.0	50	81.2	6.8	6.8
SK19-55	2019	UNR	Run 2	13	core	N/A	N/A	692	13	N/A	97.250	12.1	0.055	14.9	0.096	14.5	0.010	12.1	0.30	1047.7	211.9	313.1	65.9	8.0	8.0	92.0	12.9	12.9	72	65.9	8.0	8.0
SK19-55	2019	UNR	Run 2	14	core	N/A	N/A	2126	116	N/A	135.334	11.2	0.097	8.1	0.143	8.8	0.007	11.2	0.51	1508.2	152.4	365.1	47.4	5.3	5.3	134.7	11.2	11.2	35	47.4	5.3	5.3
SK19-55	2019	UNR	Run 2	15	core	N/A	N/A	581	3	N/A	56.003	15.8	0.043	12.5	0.102	12.5	0.018	15.8	0.22	720.8	249.5	295.6	113.7	17.8	17.8	97.6	11.7	11.7	116	113.7	17.8	17.8
SK19-55	2019	UNR	Run 2	16	core	N/A	N/A	194	1	N/A	48.945	15.9	0.053	30.6	0.189	29.5	0.020	15.9	0.21	1432.4	357.0	476.2	130.2	20.6	20.6	168.5	46.6	46.6	77	130.2	20.6	20.6
SK19-55	2019	UNR	Run 2	17	core	N/A	N/A	1445	83	N/A	62.318	17.0	0.053	11.7	0.087	12.5	0.016	17.0	0.31	779.1	169.6	241.1	102.3	17.3	17.3	84.3	10.1	10.1	121	102.3	17.3	17.3
SK19-55	2019	UNR	Run 2	18	core	N/A	N/A	663	7	N/A	79.185	14.1	0.050	15.9	0.095	15.3	0.013	14.1	0.17	922.6	212.6	294.0	80.8	11.3	11.4	91.2	13.4	13.4	89	80.8	11.3	11.4
SK19-55	2019	UNR	Run 2	19	core	N/A	N/A	200	2	N/A	65.119	10.0	0.103	17.4	0.308	18.1	0.015	10.0	-0.10	1807.7	260.8	475.6	98.1	9.7	9.9	261.1	42.3	42.3	38	98.1	9.7	9.9
SK19-55	2019	UNR	Run 2	20	core	N/A	N/A	286	3	N/A	119.860	13.9	0.047	33.9	0.067	33.1	0.008	13.9	0.13	1336.3	233.2	375.2	53.5	7.4	7.5	62.8	21.1	21.1	85	53.5	7.4	7.5
SK19-55	2019	UNR	Run 2	21	core	N/A	N/A	600	1	N/A	60.166	11.9	0.089	13.3	0.306	16.9	0.017	11.9	0.80	1490.8	225.1	397.8	106.1	12.5	12.6	262.3	39.1	39.1	40	106.1	12.5	12.6
SK19-55	2019	UNR	Run 2	22	core	N/A	N/A	352	5	N/A	117.181	12.8	0.071	15.9	0.103	16.3	0.009	12.8	0.29	1313.1	206.1	354.9	54.7	7.0	7.0	97.6	15.5	15.5	56	54.7	7.0	7.0
SK19-55	2019	UNR	Run 2	23	core	N/A	N/A	384	164	N/A	125.636	13.3	0.139	17.6	0.191	16.3	0.008	13.3	0.38	2162.9	269.4	546.8	51.1	6.7	6.8	172.1	26.0	26.0	30	51.1	6.7	6.8
SK19-55	2019	UNR	Run 2	24	core	N/A	N/A	938	4	N/A	63.248	13.7	0.054	11.0	0.131	11.2	0.016	13.7	0.20	849.9	171.1	253.5	100.9	13.7	13.7	123.7	13.1	13.1	82	100.9	13.7	13.7
SK19-55	2019	UNR	Run 2	25	core	N/A	N/A	770	14	N/A	83.697	15.9	0.060	11.5	0.098	12.5	0.012	15.9	0.44	907.6	177.8	267.4	76.4	12.0	12.1	94.3	11.2	11.2	81	76.4	12.0	12.1
SK19-55	2019	UNR	Run 2	26	core	N/A	N/A	1265	6	N/A	93.620	15.4	0.056	12.6	0.076	13.0	0.011	15.4	0.51	890.5	186.5	270.5	68.4	10.5	10.5	73.5	9.3	9.3	93	68.4	10.5	10.5
SK19-55	2019	UNR	Run 2	27	core	N/A	N/A	1051	23	N/A	122.399	13.5	0.062	10.8	0.098	14.8	0.008	13.5	0.56	927.8	167.3	263.9	52.4	7.1	7.1	94.0	13.2	13.2	56	52.4	7.1	7.1
SK19-55	2019	UNR	Run 2	28	core	N/A	N/A	1746	40	N/A	93.501	13.6	0.053	9.3	0.081	10.0	0.011	13.6	0.29	748.8	147.2	220.9	68.5	9.3	9.3	78.9	7.6	7.6	87	68.5	9.3	9.3
SK19-55	2019	UNR	Run 2	29																												

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ. [†]	Name [‡]	Zr # [§]	loc.	f206c	²⁰⁶ Pb CPS	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK19-55	2020	UCSB	Run 1	6	rim	N/A	N/A	168	26	N/A	64.475	4.1	0.049	3.1	0.104	4.9	0.016	4.1	0.76	137.0	72.0	72.1	99.2	4.0	4.0	100.7	4.7	4.7	99	99.2	4.0	4.0
SK19-55	2020	UCSB	Run 1	7	rim	N/A	N/A	935	102	N/A	87.108	1.9	0.048	1.2	0.076	1.7	0.011	1.9	0.83	97.0	29.0	29.1	73.6	1.4	1.4	74.3	1.2	1.2	99	73.6	1.4	1.4
SK19-55	2020	UCSB	Run 1	8	rim	N/A	N/A	1419	20	N/A	100.200	2.3	0.048	1.2	0.066	2.7	0.010	2.3	0.89	84.0	29.0	29.1	64.0	1.5	1.5	65.0	1.7	1.7	98	64.0	1.5	1.5
SK19-55	2020	UCSB	Run 1	9	rim	N/A	N/A	1180	122	N/A	95.602	2.5	0.048	1.5	0.069	2.8	0.010	2.5	0.86	92.0	35.0	35.1	67.0	1.7	1.7	67.2	1.8	1.8	100	67.0	1.7	1.7
SK19-55	2020	UCSB	Run 1	12	rim	N/A	N/A	1355	192	N/A	91.912	1.6	0.048	1.2	0.072	1.9	0.011	1.6	0.69	100.0	29.0	29.2	69.8	1.1	1.1	70.6	1.3	1.3	99	69.8	1.1	1.1
SK19-55	2020	UCSB	Run 1	13	core	N/A	N/A	461	4	N/A	61.275	2.4	0.050	1.2	0.113	2.9	0.016	2.4	0.88	203.0	28.0	28.7	104.4	2.5	2.5	108.5	3.0	3.0	96	104.4	2.5	2.5
SK19-55	2020	UCSB	Run 1	14	core	N/A	N/A	96	4	N/A	43.840	2.1	0.052	3.1	0.161	3.9	0.023	2.1	0.63	274.0	72.0	72.5	145.4	3.0	3.0	153.0	6.3	6.3	95	145.4	3.0	3.0
SK19-55	2020	UCSB	Run 1	16	rim	N/A	N/A	609	16	N/A	73.910	3.8	0.061	3.0	0.111	4.3	0.014	3.8	0.85	617.0	63.0	65.7	86.6	3.3	3.3	106.8	4.4	4.4	81	86.6	3.3	3.3
SK19-55	2020	UCSB	Run 1	10	rim	N/A	N/A	460	1	N/A	46.211	2.4	0.050	1.1	0.148	2.2	0.022	2.4	0.79	179.0	26.0	26.5	138.0	3.2	3.2	140.5	2.9	2.9	98	138.0	3.2	3.2
SK19-55	2020	UCSB	Run 1	17	mantle	N/A	N/A	1068	348	N/A	81.633	2.3	0.048	1.2	0.082	2.6	0.012	2.3	0.90	103.0	29.0	29.2	78.5	1.8	1.8	79.7	1.9	1.9	98	78.5	1.8	1.8
SK19-55	2020	UCSB	Run 1	17	rim	N/A	N/A	1810	123	N/A	86.881	1.7	0.047	1.1	0.075	1.7	0.012	1.7	0.82	70.0	26.0	26.1	73.8	1.2	1.2	73.5	1.3	1.3	100	73.8	1.2	1.2
SK19-55	2020	UCSB	Run 1	18	rim	N/A	N/A	582	17	N/A	73.801	3.2	0.073	3.3	0.132	4.2	0.014	3.2	0.68	994.0	66.0	72.4	86.8	2.8	2.8	125.5	4.9	4.9	69	86.8	2.8	2.8
SK19-55	2020	UCSB	Run 1	19	core	N/A	N/A	395	3	N/A	40.161	2.7	0.050	1.5	0.172	3.6	0.025	2.7	0.93	214.0	36.0	36.6	158.5	4.2	4.2	161.2	5.4	5.4	98	158.5	4.2	4.2
SK19-55	2020	UCSB	Run 1	20	rim	N/A	N/A	172	5	N/A	94.162	2.4	0.045	4.2	0.066	4.4	0.011	2.4	0.44	-33.0	87.0	-87.0	68.1	1.7	1.7	64.9	2.7	2.7	105	68.1	1.7	1.7
SK19-55	2020	UCSB	Run 1	21	rim	N/A	N/A	1309	1	N/A	41.442	1.9	0.051	1.6	0.168	2.7	0.024	1.9	0.88	219.0	37.0	37.6	153.7	3.0	3.0	157.8	3.9	3.9	97	153.7	3.0	3.0
SK19-55	2020	UCSB	Run 1	22	mantle	N/A	N/A	390	13	N/A	102.669	2.5	0.047	3.2	0.063	4.2	0.010	2.5	0.75	53.0	70.0	70.0	62.5	1.5	1.5	61.7	2.5	2.5	101	62.5	1.5	1.5
SK19-55	2020	UCSB	Run 1	22	rim	N/A	N/A	356	5	N/A	95.238	3.6	0.047	2.8	0.068	4.6	0.011	3.6	0.77	48.0	63.0	63.0	67.3	2.4	2.4	66.5	3.0	3.0	101	67.3	2.4	2.4
SK19-55	2020	UCSB	Run 1	25	core	N/A	N/A	105	3	N/A	44.763	1.9	0.050	3.8	0.153	4.2	0.022	1.9	0.61	202.0	86.0	86.2	142.4	2.7	2.7	144.1	5.6	5.6	99	142.4	2.7	2.7
SK19-55	2020	UCSB	Run 1	32	rim	N/A	N/A	6151	535	N/A	84.602	2.2	0.047	0.5	0.076	2.5	0.012	2.2	0.98	29.0	12.0	12.0	75.8	1.7	1.7	74.2	1.8	1.8	102	75.8	1.7	1.7
SK19-55	2020	UCSB	Run 1	33	rim	N/A	N/A	793	148	N/A	84.746	2.4	0.048	2.0	0.078	3.5	0.012	2.4	0.85	119.0	47.0	47.1	75.6	1.8	1.8	76.5	2.5	2.5	99	75.6	1.8	1.8
SK19-55	2020	UCSB	Run 1	43	rim	N/A	N/A	2661	42	N/A	94.073	3.1	0.047	0.8	0.069	3.5	0.011	3.1	0.97	58.0	20.0	20.1	68.2	2.1	2.1	67.4	2.3	2.3	101	68.2	2.1	2.1
SK19-55	2020	UCSB	Run 1	43	mantle	N/A	N/A	393	17	N/A	77.882	2.7	0.048	2.3	0.085	3.4	0.013	2.7	0.77	107.0	53.0	53.1	82.2	2.3	2.3	82.7	2.7	2.7	99	82.2	2.3	2.3
SK19-55	2020	UCSB	Run 1	44	rim	N/A	N/A	1633	221	N/A	102.987	2.0	0.047	1.1	0.063	2.6	0.010	2.0	0.90	68.0	26.0	26.1	62.3	1.2	1.2	61.7	1.5	1.5	101	62.3	1.2	1.2
SK19-55	2020	UCSB	Run 1	65	rim	N/A	N/A	554	6	N/A	71.942	2.4	0.049	1.5	0.093	3.2	0.014	2.4	0.79	150.0	36.0	36.3	89.0	2.1	2.1	90.6	2.8	2.8	98	89.0	2.1	2.1
SK19-55	2020	UCSB	Run 1	64	rim	N/A	N/A	115	3	N/A	90.744	2.5	0.052	5.0	0.075	6.7	0.011	2.5	0.53	280.0	110.0	110.3	70.7	1.8	1.8	73.2	4.7	4.7	97	70.7	1.8	1.8
SK19-55	2020	UCSB	Run 1	66	rim	N/A	N/A	611	302	N/A	84.175	2.4	0.054	2.4	0.088	1.8	0.012	2.4	0.56	363.0	54.0	55.1	76.2	1.8	1.8	85.7	1.5	1.5	99	76.2	1.8	1.8
SK19-55	2020	UCSB	Run 1	60	rim	N/A	N/A	193	3	N/A	41.356	3.0	0.050	2.2	0.165	3.4	0.024	3.0	0.77	177.0	51.0	51.3	154.0	4.6	4.6	154.7	4.9	4.9	100	154.0	4.6	4.6
SK19-55	2020	UCSB	Run 2	61	rim	N/A	N/A	302	7	N/A	52.770	3.5	0.048	1.9	0.126	3.2	0.019	3.5	0.89	77.0	45.0	45.2	121.0	4.2	4.2	120.8	3.7	3.7	100	121.0	4.2	4.2
SK19-55	2020	UCSB	Run 2	59	rim	N/A	N/A	917	54	N/A	95.877	2.0	0.047	1.1	0.068	2.8	0.010	2.0	0.80	54.0	25.0	25.1	66.9	1.3	1.3	66.5	1.8	1.8	101	66.9	1.3	1.3
SK19-55	2020	UCSB	Run 2	58	rim	N/A	N/A	76	3	N/A	47.619	3.1	0.051	4.4	0.145	5.3	0.021	3.1	0.43	207.0	99.0	99.5	134.0	4.1	4.1	137.1	6.8	6.8	98	134.0	4.1	4.1
SK19-55	2020	UCSB	Run 2	57	rim	N/A	N/A	397	2	N/A	53.079	2.6	0.048	2.5	0.124	3.0	0.019	2.6	0.78	110.0	55.0	55.3	120.3	3.1	3.1	119.0	3.3	3.3	101	120.3	3.1	3.1
SK19-55	2020	UCSB	Run 2	56	rim	N/A	N/A	275	2	N/A	43.898	1.4	0.049	2.6	0.155	3.7	0.023	1.4	0.86	161.0	61.0	61.5	145.2	2.0	2.0	146.4	5.0	5.0	99	145.2	2.0	2.0
SK19-55	2020	UCSB	Run 2	55	rim	N/A	N/A	875	226	N/A	83.893	2.8	0.048	1.6	0.078	3.0	0.012	2.8	0.86	89.0	37.0	37.3	76.4	2.1	2.1	76.0	2.2	2.2	101	76.4	2.1	2.1
SK19-55	2020	UCSB	Run 2	54	rim	N/A	N/A	521	2	N/A	48.591	2.6	0.048	1.6	0.135	1.7	0.021	2.6	0.89	93.0	39.0	39.3	131.3	3.3	3.3	128.8	2.1	2.1	102	131.3	3.3	3.3
SK19-55	2020	UCSB	Run 2																													

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ. [†]	Name [‡]	Zr # [‡]	loc.	f206c	²⁰⁶ Pb CPS	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK19-112	2019	UNR	Run 1	19	core	N/A	N/A	742	11	N/A	68.353	4.6	0.055	12.7	0.108	12.0	0.015	4.6	0.26	320.0	240.0	240.0	93.6	4.3	4.3	104.0	12.0	12.0	90	93.6	4.3	4.3
SK19-112	2019	UNR	Run 1	20	core	N/A	N/A	1111	6	N/A	74.129	5.0	0.049	8.2	0.093	9.2	0.013	5.0	0.20	90.0	170.0	170.0	86.4	4.3	4.3	90.0	7.9	7.9	96	86.4	4.3	4.3
SK19-112	2019	UNR	Run 1	21	core	N/A	N/A	2651	45	N/A	85.034	3.8	0.051	7.4	0.086	8.2	0.012	3.8	0.27	210.0	150.0	150.0	75.3	2.8	2.8	83.7	6.6	6.6	90	75.3	2.8	2.8
SK19-112	2019	UNR	Run 1	22	core	N/A	N/A	576	2	N/A	7.479	4.9	0.075	4.5	1.419	4.9	0.134	4.9	0.59	1045.0	94.0	94.0	808.0	37.0	37.0	898.0	27.0	27.0	90	808.0	37.0	37.0
SK19-112	2019	UNR	Run 1	23	core	N/A	N/A	342	2	N/A	48.972	4.6	0.063	12.3	0.191	13.6	0.020	4.6	0.32	550.0	260.0	260.0	131.1	5.8	5.8	170.0	20.0	20.0	77	131.1	5.8	5.8
SK19-112	2019	UNR	Run 1	24	core	N/A	N/A	120	2	N/A	43.668	6.6	0.057	22.8	0.150	22.0	0.023	6.6	-0.03	10.0	420.0	420.0	145.9	9.5	9.5	140.0	31.0	31.0	104	145.9	9.5	9.5
SK19-112	2019	UNR	Run 1	25	core	N/A	N/A	48	3	N/A	25.510	8.2	0.067	26.9	0.369	24.7	0.039	8.2	0.08	550.0	480.0	480.0	248.0	20.0	20.0	292.0	70.0	70.0	85	248.0	20.0	20.0
SK19-112	2019	UNR	Run 1	26	core	N/A	N/A	288	3	N/A	54.348	7.6	0.062	17.7	0.163	17.8	0.018	7.6	0.29	650.0	340.0	340.0	117.5	8.8	8.8	150.0	25.0	25.0	78	117.5	8.8	8.8
SK19-112	2019	UNR	Run 1	27	core	N/A	N/A	318	4	N/A	30.581	4.9	0.057	10.5	0.261	9.2	0.033	4.9	0.17	380.0	220.0	220.0	207.0	10.0	10.0	233.0	20.0	20.0	89	207.0	10.0	10.0
SK19-112	2019	UNR	Run 1	28	core	N/A	N/A	1720	4	N/A	71.891	4.7	0.052	6.7	0.098	6.3	0.014	4.7	0.41	250.0	140.0	140.0	89.0	4.1	4.1	94.5	5.8	5.8	94	89.0	4.1	4.1
SK19-112	2019	UNR	Run 1	29	core	N/A	N/A	1602	5	N/A	124.533	5.1	0.053	10.7	0.053	9.7	0.008	5.1	0.18	280.0	200.0	200.0	51.6	2.7	2.7	52.6	5.1	5.1	98	51.6	2.7	2.7
SK19-112	2019	UNR	Run 1	30	core	N/A	N/A	287	1	N/A	4.082	4.9	0.099	4.4	3.370	3.9	0.245	4.9	0.56	1583.0	81.0	81.0	1408.0	61.0	61.0	1495.0	29.0	29.0	94	1495.0	29.0	29.0
SK19-112	2019	UNR	Run 1	31	core	N/A	N/A	1322	3	N/A	24.390	5.4	0.056	5.5	0.317	6.0	0.041	5.4	0.61	450.0	120.0	120.0	259.0	14.0	14.0	279.0	15.0	15.0	93	259.0	14.0	14.0
SK19-112	2019	UNR	Run 1	32	core	N/A	N/A	678	1	N/A	14.225	4.4	0.054	4.4	0.523	4.2	0.070	4.4	0.57	363.0	93.0	93.0	437.0	19.0	19.0	425.0	15.0	15.0	103	437.0	19.0	19.0
SK19-112	2019	UNR	Run 1	33	core	N/A	N/A	197	2	N/A	6.636	5.4	0.066	6.0	1.443	6.4	0.151	5.4	0.54	790.0	120.0	120.0	90.2	46.0	46.0	900.0	40.0	40.0	100	902.0	46.0	46.0
SK19-112	2019	UNR	Run 1	34	core	N/A	N/A	297	3	N/A	13.072	6.7	0.072	8.2	0.731	8.3	0.077	6.7	0.50	930.0	170.0	170.0	474.0	30.0	30.0	551.0	35.0	35.0	86	474.0	30.0	30.0
SK19-112	2019	UNR	Run 1	35	core	N/A	N/A	1260	4	N/A	25.381	4.3	0.057	5.8	0.309	5.5	0.039	4.3	0.29	480.0	120.0	120.0	249.0	11.0	11.0	274.0	13.0	13.0	91	249.0	11.0	11.0
SK19-112	2019	UNR	Run 1	36	core	N/A	N/A	160	1	N/A	42.735	7.7	0.067	16.4	0.218	17.4	0.023	7.7	0.34	690.0	330.0	330.0	149.0	11.0	11.0	193.0	32.0	32.0	77	149.0	11.0	11.0
SK19-112	2019	UNR	Run 1	37	core	N/A	N/A	480	1	N/A	46.296	5.6	0.054	11.0	0.159	10.1	0.022	5.6	0.07	330.0	210.0	210.0	138.0	7.4	7.4	150.0	14.0	14.0	92	138.0	7.4	7.4
SK19-112	2019	UNR	Run 1	38	core	N/A	N/A	334	8	N/A	61.050	5.3	0.063	19.0	0.141	20.6	0.016	5.3	0.27	490.0	400.0	400.0	105.8	5.8	5.8	130.0	25.0	25.0	81	105.8	5.8	5.8
SK19-112	2019	UNR	Run 1	39	core	N/A	N/A	943	2	N/A	16.863	5.7	0.087	5.8	0.709	5.6	0.059	5.7	0.49	1350.0	120.0	120.0	371.0	21.0	21.0	541.0	24.0	24.0	69	371.0	21.0	21.0
SK19-112	2019	UNR	Run 1	40	core	N/A	N/A	248	1	N/A	45.045	6.3	0.055	15.1	0.165	15.2	0.022	6.3	0.28	320.0	280.0	280.0	141.4	8.7	8.7	157.0	22.0	22.0	90	141.4	8.7	8.7
SK19-112	2019	UNR	Run 1	41	core	N/A	N/A	345	1	N/A	43.478	4.8	0.042	14.9	0.139	12.9	0.023	4.8	0.04	-120.0	250.0	250.0	146.6	6.8	6.8	130.0	16.0	16.0	113	146.6	6.8	6.8
SK19-112	2019	UNR	Run 1	42	core	N/A	N/A	444	1	N/A	39.683	4.8	0.050	9.4	0.177	9.6	0.025	4.8	0.29	200.0	180.0	180.0	160.4	7.7	7.7	166.0	15.0	15.0	97	160.4	7.7	7.7
SK19-112	2019	UNR	Run 1	43	core	N/A	N/A	31	7	N/A	58.480	13.5	0.200	95.0	0.130	100.0	0.017	13.5	-0.17	-1300.0	3700.0	3700.0	109.0	14.0	14.0	160.0	130.0	130.0	68	109.0	14.0	14.0
SK19-112	2019	UNR	Run 1	44	core	N/A	N/A	1156	24	N/A	83.195	4.7	0.065	11.5	0.107	12.1	0.012	4.7	0.39	650.0	230.0	230.0	77.0	3.6	3.6	104.0	11.0	11.0	74	77.0	3.6	3.6
SK19-112	2019	UNR	Run 1	45	core	N/A	N/A	103	5	N/A	98.039	9.8	0.068	38.2	0.094	39.4	0.010	9.8	0.20	250.0	680.0	680.0	65.1	6.6	6.6	82.0	34.0	34.0	79	65.1	6.6	6.6
SK19-112	2019	UNR	Run 1	46	core	N/A	N/A	981	4	N/A	44.053	7.0	0.113	14.2	0.352	16.8	0.023	7.0	0.59	1770.0	260.0	260.0	145.0	10.0	10.0	307.0	46.0	46.0	47	145.0	10.0	10.0
SK19-112	2019	UNR	Run 1	47	core	N/A	N/A	1340	1	N/A	41.356	4.1	0.053	5.3	0.176	5.7	0.024	4.1	0.33	270.0	110.0	110.0	154.0	6.2	6.2	164.2	8.8	8.8	94	154.0	6.2	6.2
SK19-112	2019	UNR	Run 1	48	core	N/A	N/A	360	12	N/A	22.026	5.9	0.069	8.5	0.427	8.0	0.045	5.9	0.24	820.0	170.0	170.0	286.0	17.0	17.0	363.0	23.0	23.0	79	286.0	17.0	17.0
SK19-112	2019	UNR	Run 1	49	core	N/A	N/A	527	2	N/A	23.202	6.0	0.075	9.3	0.465	10.8	0.043	6.0	0.35	1050.0	190.0	190.0	272.0	16.0	16.0	380.0	34.0	34.0	72	272.0	16.0	16.0
SK19-112	2019	UNR	Run 1	50	core	N/A	N/A	523	5	N/A	34.014	6.1	0.049	9.5	0.198	9.1	0.029	6.1	0.29	180.0	190.0	190.0	187.0	12.0	12.0	182.0	15.0	15.0	103	187.0	12.0	12.0
SK19-112	2019	UNR	Run 1	51	core	N/A	N/A	361	14	N/A	84.531	6.4	0.077	15.6	0.135	17.8	0.012	6.4	0.45	850.0	350.0	350.0	75.8	4.9	4.9	125.0	21.0	21.0	61	75.8	4.9	4.9
SK19-112	2019	UNR	Run 1																													

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ. [†]	Name [‡]	Zr # [‡]	loc.	f206c	²⁰⁶ Pb CPs	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK19-112	2019	UNR	Run 1	96	core	N/A	N/A	50	4	N/A	26.455	8.5	0.058	27.6	0.321	27.4	0.038	8.5	0.28	160.0	520.0	520.0	239.0	20.0	20.0	248.0	67.0	67.0	96	239.0	20.0	20.0
SK19-112	2019	UNR	Run 1	97	core	N/A	N/A	1048	2	N/A	40.000	5.2	0.053	6.8	0.184	7.6	0.025	5.2	0.51	260.0	140.0	140.0	158.8	8.0	8.0	172.0	13.0	13.0	92	158.8	8.0	8.0
SK19-112	2019	UNR	Run 1	98	core	N/A	N/A	1260	15	N/A	41.667	8.3	0.052	6.3	0.169	8.9	0.024	8.3	0.77	250.0	130.0	130.0	153.0	13.0	13.0	158.0	13.0	13.0	97	153.0	13.0	13.0
SK19-112	2019	UNR	Run 1	99	core	N/A	N/A	59	4	N/A	33.670	7.4	0.066	24.2	0.256	25.0	0.030	7.4	0.09	370.0	490.0	490.0	188.0	14.0	14.0	212.0	50.0	50.0	89	188.0	14.0	14.0
SK19-112	2019	UNR	Run 1	100	core	N/A	N/A	129	2	N/A	42.735	6.4	0.066	21.2	0.194	22.2	0.023	6.4	0.12	330.0	430.0	430.0	149.0	9.6	9.6	170.0	36.0	36.0	88	149.0	9.6	9.6
SK19-112	2019	UNR	Run 1	101	core	N/A	N/A	570	2	N/A	39.063	4.7	0.052	9.9	0.175	9.1	0.026	4.7	0.19	190.0	200.0	200.0	162.8	7.5	7.5	164.0	14.0	14.0	99	162.8	7.5	7.5
SK19-112	2019	UNR	Run 1	102	core	N/A	N/A	1340	18	N/A	29.851	6.0	0.100	6.2	0.457	5.9	0.034	6.0	0.55	1670.0	110.0	110.0	213.0	12.0	12.0	381.0	19.0	19.0	56	213.0	12.0	12.0
SK19-112	2019	UNR	Run 1	103	core	N/A	N/A	724	7	N/A	41.152	5.8	0.063	7.7	0.208	7.7	0.024	5.8	0.38	720.0	150.0	150.0	154.9	8.5	8.5	191.0	14.0	14.0	81	154.9	8.5	8.5
SK19-112	2019	UNR	Run 1	104	core	N/A	N/A	1309	6	N/A	118.203	5.4	0.043	11.3	0.051	11.8	0.008	5.4	0.32	-100.0	210.0	210.0	54.3	3.0	3.0	50.3	5.8	5.8	108	54.3	3.0	3.0
SK19-112	2019	UNR	Run 1	105	core	N/A	N/A	1650	34	N/A	60.864	5.4	0.066	7.7	0.152	9.2	0.016	5.4	0.50	860.0	170.0	170.0	105.0	5.6	5.6	143.0	12.0	12.0	73	105.0	5.6	5.6
SK19-112	2019	UNR	Run 1	106	core	N/A	N/A	1167	1	N/A	20.243	4.3	0.059	4.9	0.404	5.9	0.049	4.3	0.63	530.0	110.0	110.0	311.0	13.0	13.0	346.0	17.0	17.0	90	311.0	13.0	13.0
SK19-112	2019	UNR	Run 1	107	core	N/A	N/A	830	4	N/A	64.935	7.1	0.081	13.6	0.167	12.0	0.015	7.1	0.09	1120.0	260.0	260.0	98.6	7.0	7.0	158.0	17.0	17.0	62	98.6	7.0	7.0
SK19-112	2019	UNR	Run 1	108	core	N/A	N/A	350	3	N/A	17.699	6.9	0.102	9.8	0.787	10.9	0.057	6.9	0.32	1560.0	190.0	190.0	354.0	23.0	23.0	577.0	47.0	47.0	61	354.0	23.0	23.0
SK19-112	2019	UNR	Run 1	109	core	N/A	N/A	445	3	N/A	62.500	7.5	0.094	13.8	0.203	15.8	0.016	7.5	0.54	1440.0	290.0	290.0	102.5	7.4	7.4	189.0	26.0	26.0	54	102.5	7.4	7.4
SK19-112	2019	UNR	Run 1	110	core	N/A	N/A	1224	7	N/A	11.876	3.1	0.171	2.7	1.961	3.3	0.084	3.1	0.66	2575.0	42.0	42.0	521.0	15.0	15.0	1105.0	21.0	21.0	47	521.0	15.0	15.0
SK19-112	2019	UNR	Run 1	111	core	N/A	N/A	785	5	N/A	21.186	4.0	0.066	4.9	0.417	5.3	0.047	4.0	0.34	780.0	110.0	110.0	297.0	12.0	12.0	352.0	15.0	15.0	84	297.0	12.0	12.0
SK19-112	2019	UNR	Run 1	112	core	N/A	N/A	297	2	N/A	57.471	6.9	0.044	19.5	0.108	22.2	0.017	6.9	0.55	-240.0	330.0	330.0	111.0	7.3	7.3	104.0	22.0	22.0	107	111.0	7.3	7.3
SK19-112	2019	UNR	Run 1	113	core	N/A	N/A	947	1	N/A	47.103	3.9	0.051	7.4	0.147	7.5	0.021	3.9	0.23	190.0	150.0	150.0	135.4	5.2	5.2	138.6	9.6	9.6	98	135.4	5.2	5.2
SK19-112	2019	UNR	Run 1	114	core	N/A	N/A	1077	2	N/A	13.495	4.5	0.066	4.9	0.673	4.8	0.074	4.5	0.45	780.0	100.0	100.0	460.0	20.0	20.0	524.0	20.0	20.0	88	460.0	20.0	20.0
SK19-112	2019	UNR	Run 1	115	core	N/A	N/A	567	3	N/A	6.901	4.9	0.080	3.6	1.547	4.3	0.145	4.9	0.72	1186.0	71.0	71.0	876.0	41.0	41.0	944.0	26.0	26.0	93	876.0	41.0	41.0
SK19-112	2019	UNR	Run 1	116	core	N/A	N/A	418	1	N/A	35.971	6.8	0.145	11.0	0.539	11.9	0.028	6.8	0.22	2210.0	210.0	210.0	177.0	12.0	12.0	433.0	43.0	43.0	41	177.0	12.0	12.0
SK19-112	2019	UNR	Run 1	117	core	N/A	N/A	497	3	N/A	37.594	6.8	0.061	14.5	0.232	16.4	0.027	6.8	0.57	620.0	300.0	300.0	169.0	11.0	11.0	213.0	32.0	32.0	79	169.0	11.0	11.0
SK19-112	2019	UNR	Run 1	118	core	N/A	N/A	254	3	N/A	8.299	5.8	0.095	5.3	1.555	5.9	0.121	5.8	0.53	1500.0	100.0	100.0	731.0	40.0	40.0	947.0	36.0	36.0	77	947.0	36.0	36.0
SK19-112	2019	UNR	Run 1	119	core	N/A	N/A	745	5	N/A	70.175	5.9	0.049	10.0	0.093	11.8	0.014	5.9	0.48	90.0	190.0	190.0	91.2	5.3	5.3	90.0	10.0	10.0	101	91.2	5.3	5.3
SK19-112	2019	UNR	Run 1	120	core	N/A	N/A	848	4	N/A	35.461	5.3	0.071	6.4	0.270	6.7	0.028	5.3	0.50	940.0	130.0	130.0	179.4	9.3	9.3	241.0	15.0	15.0	74	179.4	9.3	9.3
SK19-112	2020	UCSB	Run 1	1	rim	N/A	N/A	688	6	N/A	130.719	2.5	0.047	2.0	0.049	2.5	0.008	2.5	0.72	26.0	45.0	45.0	49.1	1.2	1.2	48.3	1.2	1.2	102	49.1	1.2	1.2
SK19-112	2020	UCSB	Run 1	1	mantle	N/A	N/A	1495	4	N/A	131.926	1.7	0.047	1.1	0.049	1.8	0.008	1.7	0.79	67.0	27.0	27.0	48.7	0.8	0.8	48.9	0.8	0.8	100	48.7	0.8	0.8
SK19-112	2020	UCSB	Run 1	1	mantle	N/A	N/A	7990	10	N/A	129.032	1.8	0.046	0.5	0.049	2.0	0.008	1.8	0.97	1.0	12.0	12.0	49.8	0.9	0.9	48.9	1.0	1.0	102	49.8	0.9	0.9
SK19-112	2020	UCSB	Run 1	2	rim	N/A	N/A	297	15	N/A	95.785	1.7	0.046	3.0	0.068	3.1	0.010	1.7	0.51	14.0	66.0	66.0	66.9	1.1	1.1	66.6	2.0	2.0	100	66.9	1.1	1.1
SK19-112	2020	UCSB	Run 1	2	mantle	N/A	N/A	71	12	N/A	92.851	3.0	0.051	6.6	0.076	5.7	0.011	3.0	0.03	320.0	150.0	150.0	69.1	2.0	2.0	74.0	4.0	4.0	93	69.1	2.0	2.0
SK19-112	2020	UCSB	Run 1	2	mantle	N/A	N/A	63	6	N/A	95.969	1.6	0.046	6.9	0.067	6.6	0.010	1.6	-0.02	10.0	140.0	140.0	66.8	1.1	1.1	65.6	4.2	4.2	102	66.8	1.1	1.1
SK19-112	2020	UCSB	Run 1	2	mantle	N/A	N/A	249	3	N/A	97.182	2.5	0.048	4.6	0.068	6.5	0.010	2.5	0.64	80.0	100.0	100.0	66.0	1.7	1.7	66.3	4.2	4.2	100	66.0	1.7	1.7
SK19-112	2020	UCSB	Run 1	109	rim	N/A	N/A	1687	325	N/A	91.075	2.2	0.047	1.0	0.071	2.4	0.011	2.2	0.93	68.0	23.0	23.0	70.4	1.5	1.5	69.7	1.6	1.6	101	70.4	1.5	1.5
SK19-112	2020	UCSB	Run 1	111	rim	N/A	N/A	851	46	N/A	51.125	3.1	0.082	0.7	0.221	3.1	0.020	3.1	0.96	1238.0	14.0	39.7	124.9	3.8	3.8	202.7	5.6	5.6	62	124.9	3.8	3.8
SK19-112	2020	UCSB	Run 1	112	rim	N/A	N/A	1248	213	N/A	89.606	3.2	0.049	1.6	0.076	3.8	0.011	3.2	0.92	168.0	36.0	36.4	71.5	2.3	2.3	74.3	2.7	2.7	96	71.5	2.3	2.3
SK19-112	2020	UCSB	Run 1	116	rim	N/A	N/A	834	28	N/A	36.550	2.9	0.065	1.0	0.244	3.3	0.027	2.9	0.99	761.0	21.0	31.0	174.0	4.9	4.9	221.5	6.6	6.6	79	174.0	4.9	4.9
SK19-112	2020	UCSB	Run 1	117	rim	N/A	N/A	1432	214	N/A	83.963	3.0	0.083	15.7	0.136	16.9	0.012	3.0	0.53	1170.0	300.0	302.0	76.3	2.3	2.3	129.0	20.0	20.0	59	76.3	2.3	2.3
SK19-112	2020	UCSB	Run 1	121	rim	N/A	N/A	1503	126	N/A	90.090	3.7	0.047	1.3	0.072	4.0	0.011	3.7	0.95	68.0	31.0	31.1	71.1	2.6	2.6	70.9	2.8	2.8	100	71.1	2.6	2.6
SK19-112	2020	UCSB	Run 1	119	rim	N/A	N/A	1176	218	N/A	91.408	2.7	0.047	0.7	0.071	2.8	0.011	2.7	0.95	60.0	16.0	16.1	70.1	1.9	1.9	69.9	1.9	1.9	100	70.1	1.9	1.9
SK19-112	2020	UCSB	Run 1	84	rim	N/A	N/A	988	180	N/A	91.743	2.1	0.049	1.5	0.073	2.2	0.011	2.1	0.87	128.0	35.0	35.2	69.9	1.5	1.5	71.7	1.5	1.5	97	69.9	1.5	1.5</

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ. [†]	Name [‡]	Zr # [§]	loc.	f206c	²⁰⁶ Pb CPS	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK19-112	2020	UCSB	Run 1	70	rim	N/A	N/A	857	70	N/A	83.126	2.6	0.049	1.4	0.081	3.4	0.012	2.6	0.74	134.0	33.0	44.2	77.1	1.8	1.8	78.7	2.0	2.0	98	77.1	1.8	1.8
SK19-159	2019	UCSB	Run 1	1	core	N/A	N/A	538	102	N/A	98.717	2.2	0.049	1.6	0.069	2.4	0.010	2.2	0.77	149.0	35.0	42.0	65.0	0.8	1.2	67.4	1.4	1.6	96	65.0	0.8	1.2
SK19-159	2019	UCSB	Run 1	2	core	N/A	N/A	301	9	N/A	80.064	1.9	0.057	2.0	0.098	3.0	0.012	1.9	0.97	480.0	46.0	74.8	80.0	2.3	2.6	94.7	5.2	5.3	84	80.0	2.3	2.6
SK19-159	2019	UCSB	Run 1	3	rim	N/A	N/A	270	4	N/A	66.489	2.1	0.050	1.0	0.103	2.6	0.015	2.1	-0.50	176.0	23.0	50.1	96.2	1.4	2.0	99.8	0.8	1.3	96	96.2	1.4	2.0
SK19-159	2019	UCSB	Run 1	3	core	N/A	N/A	129	4	N/A	45.517	4.1	0.049	1.0	0.150	4.2	0.022	4.1	0.13	166.0	24.0	27.8	140.1	1.4	2.5	142.1	2.1	2.5	99	140.1	1.4	2.5
SK19-159	2019	UCSB	Run 1	4	core	N/A	N/A	522	8	N/A	95.329	2.2	0.049	1.9	0.070	2.7	0.010	2.2	0.40	130.0	44.0	26.2	67.3	0.8	1.3	68.7	1.1	1.3	98	67.3	0.8	1.3
SK19-159	2019	UCSB	Run 1	4	mantle	N/A	N/A	805	50	N/A	97.580	0.3	0.048	1.4	0.068	1.6	0.010	0.3	0.53	118.0	33.0	33.8	65.7	0.2	1.0	67.2	1.1	1.3	98	65.7	0.2	1.0
SK19-159	2019	UCSB	Run 1	4	rim	N/A	N/A	862	24	N/A	95.393	0.9	0.048	0.8	0.070	1.2	0.010	0.9	0.77	110.0	19.0	20.1	67.2	0.6	1.2	69.0	0.8	1.0	97	67.2	0.6	1.2
SK19-159	2019	UCSB	Run 1	5	core	N/A	N/A	346	2	N/A	32.680	8.8	0.261	21.1	1.120	29.5	0.031	8.8	0.95	3200.0	370.0	416.9	194.0	17.0	17.2	750.0	150.0	150.2	26	194.0	17.0	17.2
SK19-159	2019	UCSB	Run 1	6	core	N/A	N/A	1370	2	N/A	54.201	1.1	0.049	1.0	0.125	1.9	0.018	1.1	0.77	153.0	23.0	24.8	117.8	1.3	2.2	119.5	2.2	2.5	99	117.8	1.3	2.2
SK19-159	2019	UCSB	Run 1	6	mantle	N/A	N/A	992	76	N/A	92.353	0.8	0.048	1.2	0.072	1.0	0.011	0.8	0.91	96.0	29.0	29.6	69.4	0.5	1.2	70.4	0.7	1.0	99	69.4	0.5	1.2
SK19-159	2019	UCSB	Run 1	6	rim	N/A	N/A	3310	280	N/A	100.705	0.4	0.047	0.5	0.065	0.8	0.010	0.4	0.34	72.0	12.0	12.8	63.7	0.3	1.0	63.6	0.5	0.8	100	63.7	0.3	1.0
SK19-159	2019	UCSB	Run 1	7	core	N/A	N/A	392	1	N/A	48.070	0.5	0.049	1.3	0.141	1.3	0.021	0.5	0.25	149.0	32.0	33.2	132.7	0.6	2.1	133.5	1.6	2.1	99	132.7	0.6	2.1
SK19-159	2019	UCSB	Run 1	7	mantle	N/A	N/A	758	84	N/A	92.696	0.6	0.047	1.3	0.071	1.4	0.011	0.6	0.54	70.0	30.0	30.3	69.2	0.4	1.1	69.3	1.0	1.2	100	69.2	0.4	1.1
SK19-159	2019	UCSB	Run 1	7	rim	N/A	N/A	424	14	N/A	103.842	1.0	0.051	3.6	0.067	3.1	0.010	1.0	0.40	219.0	80.0	81.1	61.8	0.7	1.1	65.8	2.0	2.1	94	61.8	0.7	1.1
SK19-159	2019	UCSB	Run 1	8	core	N/A	N/A	86	3	N/A	39.920	1.2	0.066	11.9	0.226	11.9	0.025	1.2	0.19	770.0	240.0	244.4	159.5	1.8	3.0	206.0	22.0	22.1	77	159.5	1.8	3.0
SK19-159	2019	UCSB	Run 1	9	core	N/A	N/A	633	10	N/A	60.241	0.9	0.050	1.7	0.116	1.9	0.017	0.9	0.87	205.0	39.0	40.9	106.1	1.0	1.9	111.2	2.0	2.3	95	106.1	1.0	1.9
SK19-159	2019	UCSB	Run 1	9	rim	N/A	N/A	522	172	N/A	92.473	0.7	0.047	0.9	0.070	1.2	0.011	0.7	0.59	68.0	21.0	21.4	69.3	0.5	1.1	69.0	0.8	1.0	101	69.3	0.5	1.1
SK19-159	2019	UCSB	Run 1	10	core	N/A	N/A	205	11	N/A	62.500	2.3	0.095	11.6	0.210	14.3	0.016	2.3	0.93	1510.0	220.0	237.9	102.3	2.3	2.8	193.0	25.0	25.1	53	102.3	2.3	2.8
SK19-159	2019	UCSB	Run 1	11	core	N/A	N/A	215	2	N/A	44.444	0.4	0.051	1.2	0.156	1.4	0.023	0.4	-0.02	228.0	28.0	31.2	143.5	0.7	2.2	147.5	2.0	2.5	97	143.5	0.7	2.2
SK19-159	2019	UCSB	Run 1	11	mantle	N/A	N/A	183	3	N/A	43.178	1.5	0.050	3.0	0.158	3.2	0.023	1.5	0.50	178.0	71.0	71.8	147.6	2.2	3.1	149.1	4.4	4.6	99	147.6	2.2	3.1
SK19-159	2019	UCSB	Run 1	11	rim	N/A	N/A	328	7	N/A	59.172	0.8	0.048	1.7	0.112	1.1	0.017	0.8	-0.19	111.0	41.0	41.5	108.0	0.9	1.8	108.1	1.1	1.5	100	108.0	0.9	1.8
SK19-159	2019	UCSB	Run 1	12	core	N/A	N/A	162	7	N/A	105.152	1.8	0.050	6.8	0.065	7.8	0.010	1.8	0.69	170.0	160.0	160.3	61.0	1.1	1.4	63.9	4.9	4.9	95	61.0	1.1	1.4
SK19-159	2019	UCSB	Run 1	12	rim	N/A	N/A	694	3	N/A	104.275	1.0	0.050	0.8	0.066	1.3	0.010	1.0	0.80	189.0	19.0	22.1	61.6	0.7	1.1	64.5	0.8	1.0	95	61.6	0.7	1.1
SK19-159	2019	UCSB	Run 1	13	core	N/A	N/A	752	2	N/A	45.537	0.5	0.051	3.2	0.152	3.4	0.022	0.5	0.65	215.0	69.0	70.2	140.0	0.8	2.2	143.7	4.5	4.7	97	140.0	0.8	2.2
SK19-159	2019	UCSB	Run 1	14	core	N/A	N/A	175	2	N/A	42.644	1.0	0.050	2.2	0.161	2.7	0.023	1.0	0.67	198.0	51.0	52.4	149.4	1.4	2.6	151.2	3.7	4.0	99	149.4	1.4	2.6
SK19-159	2019	UCSB	Run 1	14	rim	N/A	N/A	245	4	N/A	48.544	1.0	0.052	3.6	0.147	4.4	0.021	1.0	0.68	284.0	81.0	82.8	131.4	1.3	2.4	139.1	5.6	5.8	94	131.4	1.3	2.4
SK19-159	2019	UCSB	Run 1	15	core	N/A	N/A	158	3	N/A	43.706	0.8	0.051	1.6	0.158	1.8	0.023	0.8	0.48	228.0	37.0	39.4	145.8	1.1	2.4	148.9	2.5	2.9	98	145.8	1.1	2.4
SK19-159	2019	UCSB	Run 1	15	mantle	N/A	N/A	380	204	N/A	91.199	0.6	0.048	1.6	0.072	1.5	0.011	0.6	0.14	83.0	38.0	38.3	70.3	0.5	1.1	70.1	1.1	1.3	100	70.3	0.5	1.1
SK19-159	2019	UCSB	Run 1	15	rim	N/A	N/A	537	55	N/A	92.989	0.5	0.051	2.2	0.075	2.7	0.011	0.5	0.75	235.0	50.0	52.0	69.0	0.3	1.1	73.4	1.9	2.0	94	69.0	0.3	1.1
SK19-159	2019	UCSB	Run 1	16	core	N/A	N/A	860	18	N/A	77.760	1.9	0.074	8.7	0.129	9.3	0.013	1.9	0.60	1020.0	160.0	171.3	82.4	1.6	2.0	124.0	11.0	11.1	66	82.4	1.6	2.0
SK19-159	2019	UCSB	Run 1	17	core	N/A	N/A	218	3	N/A	43.384	0.6	0.049	2.0	0.155	1.9	0.023	0.6	0.44	162.0	50.0	50.9	146.9	0.9	2.4	146.6	2.6	3.0	100	146.9	0.9	2.4
SK19-159	2019	UCSB	Run 1	17	rim	N/A	N/A	414	3	N/A	48.733	0.7	0.049	1.3	0.138	1.2	0.021	0.7	0.49	145.0	31.0	32.2	131.0	0.9	2.2	131.2	1.4	1.9	100	131.0	0.9	2.2
SK19-159	2019	UCSB	Run 1	18	core	N/A	N/A	191	3	N/A	45.704	0.7	0.049	1.3	0.148	1.7	0.022	0.7	0.69	164.0	31.0	32.5	139.5	1.0	2.3	139.8	2.2	2.6	100	139.5		

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ. [†]	Name [‡]	Zr # [§]	loc.	f206c	206Pb CPS	U (ppm)	U/Th	206Pb/204Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											238U/206Pb	2s _z (%)	207Pb/206Pb	2s _z (%)	207Pb/235Pb	2s _z (%)	206Pb/238U	2s _z (%)	Rho	207Pb/206Pb	2s _z (ABS)	2s _{total} (ABS)	206Pb/238U	2s _z (ABS)	2s _{total} (ABS)	207Pb/235Pb	2s _z (ABS)	2s _{total} (ABS)		Date (Ma)	2s _z (ABS)	2s _{total} (ABS)
SK19-159	2019	UCSB	Run 1	42	mantle	N/A	N/A	576	58	N/A	91.659	0.9	0.051	1.7	0.077	2.3	0.011	0.9	0.76	253.0	40.0	42.8	69.9	0.6	1.2	75.3	1.7	1.9	93	69.9	0.6	1.2
SK19-159	2019	UCSB	Run 1	42	rim	N/A	N/A	602	55	N/A	92.971	0.7	0.048	1.9	0.071	1.8	0.011	0.7	0.26	87.0	45.0	45.3	69.0	0.5	1.1	69.3	1.2	1.4	100	69.0	0.5	1.1
SK19-159	2019	UCSB	Run 1	43	core	N/A	N/A	423	21	N/A	91.075	1.9	0.063	2.4	0.097	6.0	0.011	1.9	0.77	700.0	50.0	65.3	70.4	1.4	1.8	94.0	5.3	5.4	75	70.4	1.4	1.8
SK19-159	2019	UCSB	Run 1	44	core	N/A	N/A	791	82	N/A	85.251	2.4	0.072	12.1	0.117	14.5	0.012	2.4	0.96	960.0	240.0	246.8	75.2	1.8	2.1	112.0	15.0	15.0	67	75.2	1.8	2.1
SK19-159	2019	UCSB	Run 1	45	core	N/A	N/A	233	2	N/A	47.348	1.3	0.051	1.9	0.148	2.4	0.021	1.3	0.62	235.0	44.0	46.2	134.8	1.8	2.7	140.1	3.2	3.5	96	134.8	1.8	2.7
SK19-159	2019	UCSB	Run 1	45	rim	N/A	N/A	220	10	N/A	71.480	2.6	0.057	5.3	0.110	4.6	0.014	2.6	0.00	480.0	110.0	113.7	89.5	2.4	2.7	105.5	4.5	4.6	85	89.5	2.4	2.7
SK19-159	2019	UCSB	Run 1	46	core	N/A	N/A	1270	2	N/A	38.432	0.9	0.050	1.3	0.177	1.4	0.026	0.9	0.38	172.0	31.0	32.7	165.6	1.5	2.9	165.7	2.1	2.7	100	165.6	1.5	2.9
SK19-159	2019	UCSB	Run 1	46	rim	N/A	N/A	1610	11	N/A	49.702	0.5	0.051	1.4	0.142	1.7	0.020	0.5	0.86	255.0	32.0	35.5	128.4	0.7	2.0	135.0	2.2	2.6	95	128.4	0.7	2.0
SK19-159	2019	UCSB	Run 1	47	core	N/A	N/A	216	3	N/A	44.843	1.1	0.049	3.5	0.149	3.8	0.022	1.1	0.55	120.0	84.0	84.3	142.2	1.5	2.6	141.2	5.0	5.2	101	142.2	1.5	2.6
SK19-159	2019	UCSB	Run 1	47	rim	N/A	N/A	394	223	N/A	95.795	0.9	0.050	3.0	0.072	2.9	0.010	0.9	0.12	183.0	70.0	70.9	67.0	0.6	1.2	70.3	2.0	2.1	95	67.0	0.6	1.2
SK19-159	2019	UCSB	Run 1	48	core	N/A	N/A	1520	49	N/A	94.787	1.1	0.048	1.0	0.071	1.6	0.011	1.1	0.74	121.0	24.0	25.1	67.6	0.8	1.3	69.5	1.0	1.2	97	67.6	0.8	1.3
SK19-159	2019	UCSB	Run 1	48	rim	N/A	N/A	1561	53	N/A	94.438	0.9	0.048	1.1	0.070	0.9	0.011	0.9	0.03	107.0	27.0	27.8	67.9	0.6	1.2	69.1	0.6	0.9	98	67.9	0.6	1.2
SK19-159	2019	UCSB	Run 1	49	core	N/A	N/A	661	4	N/A	44.366	0.4	0.049	0.8	0.151	1.2	0.023	0.4	0.77	136.0	18.0	19.8	143.7	0.6	2.2	143.2	1.6	2.1	100	143.7	0.6	2.2
SK19-159	2019	UCSB	Run 1	49	rim	N/A	N/A	1453	101	N/A	99.305	1.8	0.048	1.2	0.067	1.5	0.010	1.8	0.85	117.0	28.0	28.9	64.6	1.2	1.5	66.0	1.0	1.2	98	64.6	1.2	1.5
SK19-159	2019	UCSB	Run 1	50	core	N/A	N/A	96	2	N/A	39.651	0.9	0.057	3.7	0.196	3.4	0.025	0.9	0.37	490.0	80.0	85.2	160.6	1.4	2.8	182.0	5.6	5.9	88	160.6	1.4	2.8
SK19-159	2019	UCSB	Run 1	50	rim	N/A	N/A	225	70	N/A	81.433	3.7	0.062	4.5	0.105	5.4	0.012	3.7	0.77	679.0	95.0	103.4	78.7	2.9	3.1	101.7	5.2	5.3	77	78.7	2.9	3.1
SK19-159	2019	UCSB	Run 1	51	core	N/A	N/A	318	18	N/A	23.004	1.4	0.071	1.7	0.441	3.6	0.043	1.4	0.15	961.0	36.0	68.0	274.3	3.6	5.5	371.0	11.0	11.6	74	274.3	3.6	5.5
SK19-159	2019	UCSB	Run 1	52	core	N/A	N/A	153	3	N/A	45.788	3.9	0.049	1.5	0.150	3.2	0.022	3.9	0.93	150.0	35.0	36.1	139.3	5.4	5.8	141.9	4.3	4.5	98	139.3	5.4	5.8
SK19-159	2019	UCSB	Run 1	52	rim	N/A	N/A	451	5	N/A	56.092	0.4	0.049	1.6	0.121	1.6	0.018	0.4	0.43	162.0	37.0	38.3	113.9	0.5	1.8	116.0	1.7	2.1	98	113.9	0.5	1.8
SK19-159	2019	UCSB	Run 1	53	core	N/A	N/A	348	5	N/A	107.181	1.7	0.057	10.8	0.073	12.7	0.009	1.7	0.93	440.0	220.0	221.6	59.9	1.0	1.3	71.9	8.7	8.7	83	59.9	1.0	1.3
SK19-159	2019	UCSB	Run 1	54	core	N/A	N/A	161	3	N/A	43.346	0.9	0.051	1.4	0.161	1.8	0.023	0.9	0.59	218.0	34.0	36.4	147.0	1.3	2.6	151.5	2.5	2.9	97	147.0	1.3	2.6
SK19-159	2019	UCSB	Run 1	54	mantle	N/A	N/A	484	107	N/A	94.742	0.4	0.050	1.8	0.073	1.8	0.011	0.4	0.60	202.0	41.0	42.8	67.7	0.3	1.1	71.4	1.3	1.5	95	67.7	0.3	1.1
SK19-159	2019	UCSB	Run 1	54	rim	N/A	N/A	739	94	N/A	94.805	0.5	0.047	0.6	0.068	0.8	0.011	0.5	0.73	32.0	15.0	15.1	67.6	0.4	1.1	66.7	0.5	0.8	101	67.6	0.4	1.1
SK19-159	2019	UCSB	Run 1	55	core	N/A	N/A	192	10	N/A	59.666	2.7	0.058	8.1	0.134	10.4	0.017	2.7	0.97	510.0	170.0	172.7	107.1	2.9	3.3	128.0	13.0	13.1	84	107.1	2.9	3.3
SK19-159	2019	UCSB	Run 1	56	core	N/A	N/A	107	3	N/A	50.100	1.1	0.050	3.0	0.138	3.1	0.020	1.1	-0.33	192.0	73.0	73.9	127.4	1.3	2.3	131.3	3.9	4.1	97	127.4	1.3	2.3
SK19-159	2019	UCSB	Run 1	56	rim	N/A	N/A	237	2	N/A	54.996	0.4	0.051	1.8	0.127	1.7	0.018	0.4	0.07	231.0	42.0	44.2	116.2	0.5	1.8	121.4	2.0	2.3	96	116.2	0.5	1.8
SK19-159	2019	UCSB	Run 1	57	core	N/A	N/A	318	2	N/A	45.788	0.8	0.050	1.2	0.150	1.6	0.022	0.8	0.73	179.0	28.0	30.0	139.3	1.1	2.4	141.4	2.2	2.6	99	139.3	1.1	2.4
SK19-159	2019	UCSB	Run 1	58	core	N/A	N/A	140	3	N/A	42.699	0.4	0.050	2.6	0.161	2.9	0.023	0.4	0.71	185.0	62.0	63.0	149.3	0.6	2.3	151.2	4.1	4.4	99	149.3	0.6	2.3
SK19-159	2019	UCSB	Run 1	58	rim	N/A	N/A	375	4	N/A	39.620	0.9	0.049	1.5	0.171	2.1	0.025	0.9	0.69	159.0	34.0	35.3	160.7	1.4	2.8	160.0	3.1	3.5	100	160.7	1.4	2.8
SK19-159	2019	UCSB	Run 1	59	core	N/A	N/A	460	3	N/A	45.788	2.0	0.049	1.2	0.146	1.6	0.022	2.0	0.80	134.0	29.0	30.1	139.2	2.8	3.5	138.7	2.0	2.4	100	139.2	2.8	3.5
SK19-159	2019	UCSB	Run 1	59	mantle	N/A	N/A	238	350	N/A	92.481	0.8	0.050	2.2	0.074	1.9	0.011	0.8	0.15	169.0	51.0	52.0	69.3	0.5	1.2	72.0	1.4	1.6	96	69.3	0.5	1.2
SK19-159	2019	UCSB	Run 1	59	rim	N/A	N/A	707	599	N/A	96.768	0.3	0.052	1.3	0.073	1.7	0.010	0.3	0.57	265.0	31.0	34.8	66.3	0.2	1.0	71.2	1.2	1.4	93	66.3	0.2	1.0
SK19-159	2019	UCSB	Run 1	60	core	N/A	N/A	816	7	N/A	48.900	1.1	0.051	1.3	0.142	2.0	0.020	1.1	0.96	230.0	29.0	32.1	130.5	1.5	2.5	135.0	2.6	2.9	97	130.5	1.5	2.5
SK19-159	2019	UCSB	Run 1	61	core	N/A	N/A	1467	4	N/A	39.635	1.2	0.050	0.9	0.173	1.2	0.025	1.2	0.68	194.0	22.0	24.9	160.6	1.9	3.1	162.3	1.8	2.4				

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ.*	Name [‡]	Zr # [§]	loc.	f206c	²⁰⁶ Pb CPS	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK19-159	2019	UCSB	Run 1	88	core	N/A	N/A	1810	1	N/A	82.919	0.9	0.051	1.1	0.084	1.0	0.012	0.9	0.68	244.0	24.0	28.1	77.3	0.7	1.3	81.7	0.8	1.1	95	77.3	0.7	1.3
SK19-159	2019	UCSB	Run 1	88	rim	N/A	N/A	313	3	N/A	54.585	0.8	0.050	1.7	0.123	0.6	0.018	0.8	0.06	177.0	38.0	39.5	117.0	0.9	2.0	117.5	0.7	1.3	100	117.0	0.9	2.0
SK19-159	2019	UCSB	Run 1	89	core	N/A	N/A	309	4	N/A	105.141	0.9	0.048	1.5	0.063	1.9	0.010	0.9	0.42	99.0	35.0	35.5	61.0	0.5	1.1	61.7	1.2	1.3	99	61.0	0.5	1.1
SK19-159	2019	UCSB	Run 1	89	rim	N/A	N/A	300	8	N/A	103.093	0.7	0.051	1.9	0.068	2.4	0.010	0.7	0.61	256.0	44.0	46.6	62.2	0.5	1.0	66.7	1.5	1.6	93	62.2	0.5	1.0
SK19-159	2019	UCSB	Run 1	90	core	N/A	N/A	160	2	N/A	47.939	0.8	0.051	1.9	0.146	2.3	0.021	0.8	0.57	247.0	43.0	45.5	133.1	1.1	2.3	138.0	2.9	3.2	96	133.1	1.1	2.3
SK19-159	2019	UCSB	Run 1	90	rim	N/A	N/A	176	586	N/A	94.429	1.2	0.055	2.9	0.079	3.5	0.011	1.2	0.82	394.0	66.0	70.1	67.9	0.8	1.3	77.6	2.6	2.7	88	67.9	0.8	1.3
SK19-159	2019	UCSB	Run 1	91	core	N/A	N/A	1217	1	N/A	36.860	0.7	0.051	1.7	0.190	2.1	0.027	0.7	0.83	256.0	39.0	41.9	172.5	1.1	2.8	176.4	3.3	3.7	98	172.5	1.1	2.8
SK19-159	2019	UCSB	Run 1	92	core	N/A	N/A	246	8	N/A	99.404	1.0	0.050	2.2	0.068	2.8	0.010	1.0	0.67	183.0	52.0	53.1	64.5	0.7	1.2	67.1	1.8	1.9	96	64.5	0.7	1.2
SK19-159	2019	UCSB	Run 1	92	rim	N/A	N/A	889	17	N/A	106.045	1.4	0.049	0.7	0.062	1.6	0.009	1.4	0.89	126.0	16.0	17.7	60.5	0.8	1.2	61.3	1.0	1.1	99	60.5	0.8	1.2
SK19-159	2019	UCSB	Run 1	93	core	N/A	N/A	656	4	N/A	64.226	1.2	0.050	1.8	0.107	3.0	0.016	1.2	0.80	205.0	42.0	43.8	99.6	1.2	1.9	102.9	2.9	3.1	97	99.6	1.2	1.9
SK19-159	2019	UCSB	Run 1	94	core	N/A	N/A	305	3	N/A	51.125	2.8	0.055	3.3	0.147	3.8	0.020	2.8	0.78	422.0	71.0	75.4	124.9	3.5	4.0	139.3	4.9	5.1	90	124.9	3.5	4.0
SK19-159	2019	UCSB	Run 1	95	core	N/A	N/A	551	3	N/A	42.230	0.5	0.050	1.1	0.162	0.7	0.024	0.5	0.16	193.0	26.0	28.5	150.9	0.7	2.4	152.5	1.0	1.8	99	150.9	0.7	2.4
SK19-159	2019	UCSB	Run 1	95	rim	N/A	N/A	323	5	N/A	45.249	0.7	0.050	1.3	0.150	1.5	0.022	0.7	0.51	179.0	31.0	32.8	140.9	1.0	2.3	141.4	2.1	2.5	100	140.9	1.0	2.3
SK19-159	2019	UCSB	Run 1	96	core	N/A	N/A	279	3	N/A	50.865	1.0	0.052	1.7	0.139	2.0	0.020	1.0	0.27	281.0	38.0	41.6	125.5	1.2	2.2	132.2	2.5	2.8	95	125.5	1.2	2.2
SK19-159	2019	UCSB	Run 1	96	mantle	N/A	N/A	775	78	N/A	96.071	0.5	0.049	0.7	0.070	0.7	0.010	0.5	0.37	158.0	15.0	17.7	66.8	0.4	1.1	69.0	0.5	0.8	97	66.8	0.4	1.1
SK19-159	2019	UCSB	Run 1	96	rim	N/A	N/A	786	75	N/A	94.482	0.7	0.048	0.9	0.069	1.2	0.011	0.7	0.08	77.0	21.0	21.5	67.9	0.5	1.1	67.5	0.8	1.0	100	67.9	0.5	1.1
SK19-159	2019	UCSB	Run 1	97	core	N/A	N/A	483	2	N/A	46.729	2.3	0.058	3.8	0.169	5.8	0.021	2.3	0.96	520.0	81.0	86.8	136.5	3.1	3.7	158.1	8.4	8.5	86	136.5	3.1	3.7
SK19-159	2019	UCSB	Run 1	98	core	N/A	N/A	99	4	N/A	38.580	1.9	0.056	5.4	0.197	7.1	0.026	1.9	0.90	440.0	120.0	122.9	165.0	3.0	3.9	183.0	12.0	12.1	90	165.0	3.0	3.9
SK19-159	2020	UCSB	Run 1	25	rim	N/A	N/A	546	68	N/A	91.324	3.0	0.054	4.4	0.083	5.3	0.011	3.0	0.68	380.0	100.0	100.6	70.2	2.1	2.1	80.6	4.1	4.1	87	70.2	2.1	2.1
SK19-159	2020	UCSB	Run 1	19	rim	N/A	N/A	1812	101	N/A	93.284	2.9	0.048	1.2	0.073	2.5	0.011	2.9	0.94	98.0	29.0	29.1	68.7	2.0	2.0	71.2	1.7	1.7	96	68.7	2.0	2.0
SK19-159	2020	UCSB	Run 1	14	rim	N/A	N/A	133	3	N/A	43.048	2.5	0.052	2.3	0.170	3.5	0.023	2.5	0.82	281.0	51.0	51.7	148.0	3.6	3.6	159.2	5.2	5.2	93	148.0	3.6	3.6
SK19-159	2020	UCSB	Run 1	13	rim	N/A	N/A	1022	2	N/A	49.334	4.1	0.071	6.2	0.200	9.0	0.020	4.1	0.60	960.0	130.0	133.2	129.3	5.3	5.3	185.0	15.0	15.0	70	129.3	5.3	5.3
SK19-159	2020	UCSB	Run 1	24	rim	N/A	N/A	190	4	N/A	53.277	3.0	0.051	2.0	0.133	4.0	0.019	3.0	0.87	233.0	48.0	48.5	119.9	3.6	3.6	127.0	4.8	4.8	94	119.9	3.6	3.6
SK19-159	2020	UCSB	Run 1	12	rim	N/A	N/A	153	7	N/A	99.010	3.4	0.049	6.0	0.068	5.9	0.010	3.4	0.28	120.0	130.0	130.0	64.8	2.2	2.2	66.5	3.8	3.8	97	64.8	2.2	2.2
SK19-159	2020	UCSB	Run 1	9	rim	N/A	N/A	429	5	N/A	105.708	2.6	0.053	2.3	0.069	3.3	0.009	2.6	0.74	323.0	49.0	49.9	60.7	1.6	1.6	68.1	2.2	2.2	89	60.7	1.6	1.6
SK19-159	2020	UCSB	Run 1	6	rim	N/A	N/A	2174	139	N/A	97.087	2.9	0.048	0.7	0.068	3.4	0.010	2.9	0.96	91.0	16.0	16.2	66.0	1.9	1.9	67.5	2.4	2.4	98	66.0	1.9	1.9
SK19-159	2020	UCSB	Run 1	6	mantle	N/A	N/A	772	169	N/A	90.827	2.5	0.048	1.3	0.074	2.9	0.011	2.5	0.91	115.0	31.0	31.2	70.6	1.8	1.8	72.1	2.0	2.0	98	70.6	1.8	1.8
SK19-159	2020	UCSB	Run 1	4	mantle	N/A	N/A	380	16	N/A	92.336	1.8	0.049	2.5	0.073	2.7	0.011	1.8	0.52	126.0	57.0	57.1	69.4	1.2	1.2	71.4	1.9	1.9	97	69.4	1.2	1.2
SK19-159	2020	UCSB	Run 1	4	rim	N/A	N/A	549	33	N/A	93.545	2.6	0.048	2.0	0.071	3.5	0.011	2.6	0.75	108.0	47.0	47.1	68.5	1.8	1.8	70.0	2.4	2.4	98	68.5	1.8	1.8
SK19-159	2020	UCSB	Run 1	3	rim	N/A	N/A	163	4	N/A	45.208	2.9	0.050	3.0	0.157	3.9	0.022	2.9	0.77	190.0	69.0	69.2	141.0	4.0	4.0	147.6	5.4	5.4	96	141.0	4.0	4.0
SK19-159	2020	UCSB	Run 1	29	rim	N/A	N/A	118	17	N/A	71.736	3.2	0.103	4.3	0.194	4.4	0.014	3.2	0.85	1678.0	77.0	92.0	89.2	2.8	2.8	180.2	7.2	7.2	50	89.2	2.8	2.8
SK19-159	2020	UCSB	Run 1	33	rim	N/A	N/A	944	52	N/A	91.827	1.6	0.048	1.8	0.073	3.0	0.011	1.6	0.82	100.0	42.0	42.1	69.8	1.1	1.1	71.5	2.1	2.1	98	69.8	1.1	1.1
SK19-159	2020	UCSB	Run 1	40	rim	N/A	N/A	444	7	N/A	63.857	3.3	0.051	2.7	0.110	4.4	0.016	3.3	0.87	252.0	56.0	56.5	100.2	3.2	3.2	106.1	4.5	4.5	94	100.2	3.2	3.2
SK19-159	2020	UCSB	Run 1	45	rim	N/A	N/A	224	14	N/A	75.311	2.4	0.055	2.5	0.101	4.0	0.013	2.4	0.74	416.0	55.0	56.4	85.2	2.0	2.0	97.5	3.7	3.7	87	85.2	2.0	2.0
SK1><																																

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ. [†]	Name [‡]	Zr # [§]	loc.	f206c	²⁰⁶ Pb CPS	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK06-1C	2019	UNR	Run 2	32	core	N/A	N/A	1029	1	N/A	3.682	14.6	0.113	4.6	2.894	5.0	0.272	14.6	0.30	1838.8	85.9	413.6	1532.5	194.0	195.4	1376.6	37.1	111	1376.6	37.1	37.1	
SK06-1C	2019	UNR	Run 2	33	core	N/A	N/A	168	1	N/A	16.223	11.2	0.079	11.3	0.933	9.9	0.062	11.2	0.32	1131.7	217.1	330.3	384.8	41.8	42.2	663.4	46.6	58	384.8	41.8	42.2	
SK06-1C	2019	UNR	Run 2	34	core	N/A	N/A	704	6	N/A	37.505	11.1	0.131	8.8	0.588	10.2	0.027	11.1	0.66	2056.3	173.0	484.3	169.4	18.6	18.8	462.5	38.1	38.1	37	169.4	18.6	18.8
SK06-1C	2019	UNR	Run 2	35	core	N/A	N/A	1421	1	N/A	18.593	14.2	0.059	8.5	0.340	8.0	0.054	14.2	0.40	708.1	132.1	204.2	336.2	46.4	46.7	295.4	20.7	20.7	114	336.2	46.4	46.7
SK06-1C	2019	UNR	Run 2	36	core	N/A	N/A	167	6	N/A	100.799	14.1	0.068	35.0	0.097	34.3	0.010	14.1	0.22	1878.0	384.4	564.4	63.5	8.9	8.9	87.4	29.7	29.7	73	63.5	8.9	8.9
SK06-1C	2019	UCSB	Run 2	37	core	N/A	N/A	209	7	N/A	96.246	1.3	0.047	3.0	0.067	3.1	0.010	1.3	0.59	67.0	66.0	66.0	66.7	0.8	1.3	65.8	2.0	2.1	101	66.7	0.8	1.3
SK06-1C	2019	UCSB	Run 2	37	mantle	N/A	N/A	78	8	N/A	100.908	1.2	0.055	5.1	0.075	4.5	0.010	1.2	-0.38	410.0	110.0	110.5	63.6	0.8	1.2	73.4	3.2	3.3	87	63.6	0.8	1.2
SK06-1C	2019	UCSB	Run 2	37	rim	N/A	N/A	185	32	N/A	108.738	0.6	0.049	2.1	0.061	2.0	0.009	0.6	0.31	122.0	51.0	51.1	59.2	0.4	1.0	60.4	1.1	1.3	98	59.2	0.4	1.0
SK06-1C	2019	UCSB	Run 2	38	core	N/A	N/A	704	1	N/A	40.933	0.5	0.051	2.1	0.172	1.9	0.024	0.5	-0.65	251.0	50.0	50.4	155.6	0.8	2.5	160.7	2.8	3.2	97	155.6	0.8	2.5
SK06-1C	2019	UCSB	Run 2	38	rim	N/A	N/A	217	2	N/A	39.714	0.5	0.050	1.0	0.173	1.0	0.025	0.5	0.71	209.0	23.0	23.6	160.3	0.8	2.5	161.7	1.4	2.1	99	160.3	0.8	2.5
SK06-1C	2019	UCSB	Run 2	39	core	N/A	N/A	180	2	N/A	46.512	1.6	0.050	3.8	0.146	4.0	0.022	1.6	0.35	179.0	91.0	91.1	137.1	2.2	3.0	138.6	5.1	5.3	99	137.1	2.2	3.0
SK06-1C	2019	UCSB	Run 2	40	core	N/A	N/A	26	2	N/A	51.680	1.2	0.054	7.8	0.143	7.0	0.019	1.2	-0.11	400.0	210.0	210.2	123.6	1.5	2.4	135.4	9.1	9.2	91	123.6	1.5	2.4
SK06-1C	2019	UCSB	Run 2	41	core	N/A	N/A	844	6	N/A	93.310	0.9	0.048	0.9	0.069	1.6	0.011	0.9	0.47	74.0	21.0	21.1	68.7	0.6	1.2	68.1	1.0	1.2	101	68.7	0.6	1.2
SK06-1C	2019	UCSB	Run 2	41	rim	N/A	N/A	998	9	N/A	92.730	0.7	0.047	0.9	0.070	1.3	0.011	0.7	0.19	69.0	23.0	23.1	69.1	0.5	1.2	69.1	0.9	1.1	100	69.1	0.5	1.2
SK06-1C	2019	UCSB	Run 2	42	core	N/A	N/A	304	4	N/A	9.149	7.1	0.099	1.0	1.480	7.4	0.109	7.1	1.00	1597.0	19.0	44.2	669.0	45.0	46.1	920.0	45.0	45.9	73	669.0	45.0	46.1
SK06-1C	2019	UCSB	Run 2	43	core	N/A	N/A	355	6	N/A	8.117	1.6	0.074	2.4	1.241	3.5	0.123	1.6	0.93	1027.0	49.0	55.3	749.0	11.0	15.7	819.0	20.0	21.6	91	749.0	11.0	15.7
SK06-1C	2019	UCSB	Run 2	44	core	N/A	N/A	811	4	N/A	9.183	1.1	0.071	0.6	1.062	0.8	0.109	1.1	0.98	966.0	12.0	27.0	666.5	6.9	12.1	734.9	4.0	8.4	91	666.5	6.9	12.1
SK06-1C	2019	UCSB	Run 2	45	core	N/A	N/A	108	3	N/A	50.582	1.0	0.053	9.3	0.143	9.1	0.020	1.0	-0.31	300.0	200.0	200.1	126.2	1.2	2.2	136.0	11.0	11.1	93	126.2	1.2	2.2
SK06-1C	2019	UCSB	Run 2	46	core	N/A	N/A	564	11	N/A	26.738	1.8	0.075	1.6	0.383	2.9	0.037	1.8	0.91	1064.0	32.0	41.6	236.7	4.3	5.6	329.5	8.3	8.9	72	236.7	4.3	5.6
SK06-1C	2019	UCSB	Run 2	46	rim	N/A	N/A	363	66	N/A	131.596	0.7	0.047	1.9	0.049	1.9	0.008	0.7	0.34	47.0	45.0	45.0	48.8	0.3	0.8	48.5	0.9	1.0	101	48.8	0.3	0.8
SK06-1C	2019	UCSB	Run 2	47	core	N/A	N/A	799	11	N/A	92.293	0.8	0.047	0.7	0.070	1.1	0.011	0.8	0.41	48.0	26.0	26.0	69.5	0.6	1.2	68.4	0.8	1.0	102	69.5	0.6	1.2
SK06-1C	2019	UCSB	Run 2	47	mantle	N/A	N/A	2539	12	N/A	95.648	0.3	0.048	0.5	0.069	0.9	0.010	0.3	0.70	100.0	13.0	13.2	67.1	0.2	1.0	67.8	0.6	0.9	99	67.1	0.2	1.0
SK06-1C	2019	UCSB	Run 2	47	rim	N/A	N/A	3550	11	N/A	95.785	1.0	0.048	0.8	0.069	0.8	0.010	1.0	0.61	100.0	18.0	18.2	66.9	0.7	1.2	67.4	0.6	0.9	99	66.9	0.7	1.2
SK06-1C	2019	UCSB	Run 2	48	core	N/A	N/A	351	2	N/A	36.846	1.3	0.051	1.8	0.191	0.7	0.027	1.3	-0.48	250.0	42.0	42.5	172.6	2.3	3.5	177.2	1.2	2.1	97	172.6	2.3	3.5
SK06-1C	2019	UCSB	Run 2	48	rim	N/A	N/A	210	2	N/A	27.832	0.6	0.051	1.2	0.251	1.6	0.036	0.6	0.41	224.0	29.0	29.5	227.5	1.2	3.6	227.1	3.3	4.0	100	227.5	1.2	3.6
SK06-1C	2019	UCSB	Run 2	49	core	N/A	N/A	297	2	N/A	39.211	0.4	0.054	3.3	0.188	3.6	0.026	0.4	-0.36	361.0	75.0	75.5	162.3	0.6	2.5	175.2	5.8	6.1	93	162.3	0.6	2.5
SK06-1C	2019	UCSB	Run 2	49	mantle	N/A	N/A	144	3	N/A	32.531	0.4	0.051	1.0	0.216	0.8	0.031	0.4	0.26	243.0	24.0	24.8	195.2	0.7	3.0	198.4	1.5	2.5	98	195.2	0.7	3.0
SK06-1C	2019	UCSB	Run 2	49	rim	N/A	N/A	1061	29	N/A	87.192	0.7	0.048	0.9	0.075	0.7	0.011	0.7	0.48	81.0	21.0	21.1	73.5	0.5	1.2	73.6	0.5	0.9	100	73.5	0.5	1.2
SK06-1C	2019	UCSB	Run 2	50	core	N/A	N/A	92	8	N/A	98.522	2.1	0.053	5.3	0.073	4.5	0.010	2.1	0.47	320.0	120.0	120.3	65.1	1.3	1.6	71.9	3.1	3.2	91	65.1	1.3	1.6
SK06-1C	2019	UCSB	Run 2	50	mantle	N/A	N/A	159	5	N/A	99.108	1.1	0.049	2.4	0.069	2.0	0.010	1.1	0.57	149.0	59.0	59.1	64.7	0.7	1.2	67.2	1.3	1.5	96	64.7	0.7	1.2
SK06-1C	2019	UCSB	Run 2	50	rim	N/A	N/A	146	11	N/A	110.865	1.6	0.059	5.8	0.072	6.9	0.009	1.6	0.85	540.0	120.0	120.8	57.9	0.9	1.3	70.8	4.7	4.8	82	57.9	0.9	1.3
SK06-1C	2019	UCSB	Run 2	51	core	N/A	N/A	74	7	N/A	98.522	1.6	0.050	5.3	0.071	4.0	0.010	1.6	0.10	170.0	120.0	120.1	65.1	1.0	1.4	69.1	2.7	2.8	94	65.1	1.0	1.4
SK06-1C	2019	UCSB	Run 2	51	rim	N/A	N/A	99	8	N/A	95.511	1.0	0.050	3.6	0.072	3.8	0.010	1.0	0.39	187.0	82.0	82.1	67.2	0.6	1.2	70.3	2.5	2.6	96	67.2	0.6	1.2
SK06-1C	2019	UCSB	Run 2	52	core	N/A	N/A	118	5	N/A	96.256	0.8	0.048	2.9	0.068	3.5	0.010	0.8	0.71	88.0	68.0	68.0	66.6	0.5	1.1	66.7	2.3	2.4	100	6		

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ.*	Name [‡]	Zr # [§]	loc.	f206c	²⁰⁶ Pb CPS	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ U	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ U	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK06-1C	2019	UCSB	Run 2	75	core	N/A	N/A	1563	11	N/A	94.787	1.3	0.048	1.4	0.070	1.6	0.011	1.3	0.62	116.0	33.0	33.1	67.7	0.9	1.3	68.9	1.0	1.2	98	67.7	0.9	1.3
SK06-1C	2019	UCSB	Run 2	75	rim	N/A	N/A	1822	12	N/A	94.020	0.6	0.049	1.4	0.071	1.4	0.011	0.6	0.89	146.0	33.0	33.2	68.2	0.4	1.1	69.8	1.0	1.2	98	68.2	0.4	1.1
SK06-1C	2019	UCSB	Run 2	76	core	N/A	N/A	740	53	N/A	95.329	1.8	0.048	1.2	0.069	2.2	0.010	1.8	0.73	93.0	28.0	28.1	67.3	1.2	1.6	68.2	1.4	1.6	99	67.3	1.2	1.6
SK06-1C	2019	UCSB	Run 2	76	mantle	N/A	N/A	414	66	N/A	94.509	0.8	0.049	0.8	0.071	0.9	0.011	0.8	0.39	130.0	19.0	19.3	67.9	0.5	1.1	69.4	0.6	0.9	98	67.9	0.5	1.1
SK06-1C	2019	UCSB	Run 2	76	rim	N/A	N/A	753	59	N/A	94.162	1.0	0.049	1.9	0.072	2.5	0.011	1.0	0.78	157.0	45.0	45.2	68.1	0.7	1.2	70.2	1.7	1.8	97	68.1	0.7	1.2
SK06-1C	2019	UCSB	Run 2	77	core	N/A	N/A	273	3	N/A	100.583	0.5	0.050	1.6	0.068	1.6	0.010	0.5	0.20	209.0	31.0	31.4	63.8	0.3	1.0	67.1	1.0	1.2	95	63.8	0.3	1.0
SK06-1C	2019	UCSB	Run 2	77	rim	N/A	N/A	148	4	N/A	98.619	1.1	0.051	3.1	0.071	2.9	0.010	1.1	-0.01	240.0	73.0	73.2	65.0	0.7	1.2	69.9	2.0	2.1	93	65.0	0.7	1.2
SK06-1C	2019	UCSB	Run 2	78	core	N/A	N/A	172	1	N/A	9.814	2.2	0.060	0.5	0.839	2.3	0.102	2.2	0.97	601.0	10.0	18.0	625.0	13.0	16.0	618.0	11.0	12.6	101	625.0	13.0	16.0
SK06-1C	2019	UCSB	Run 2	79	core	N/A	N/A	13	5	N/A	27.056	1.5	0.059	5.6	0.298	5.4	0.037	1.5	0.31	600.0	150.0	150.7	234.0	3.5	5.0	265.0	12.0	12.3	88	234.0	3.5	5.0
SK06-1C	2019	UCSB	Run 2	79	rim	N/A	N/A	17	5	N/A	26.947	1.0	0.056	7.3	0.284	7.0	0.037	1.0	0.05	440.0	170.0	170.4	234.9	2.4	4.3	253.0	16.0	16.2	93	234.9	2.4	4.3
SK06-1C	2019	UCSB	Run 2	80	core	N/A	N/A	511	15	N/A	12.553	0.8	0.062	0.7	0.691	1.4	0.080	0.8	0.22	690.0	15.0	22.9	494.1	3.8	8.3	533.2	5.8	7.9	93	494.1	3.8	8.3
SK06-1C	2019	UCSB	Run 2	80	rim	N/A	N/A	580	41	N/A	61.087	5.1	0.053	1.1	0.120	6.3	0.016	5.1	1.00	331.0	24.0	25.4	104.7	5.3	5.5	114.6	6.8	6.9	91	104.7	5.3	5.5
SK06-1C	2019	UCSB	Run 2	81	core	N/A	N/A	1208	2	N/A	43.516	1.5	0.049	0.8	0.157	0.6	0.023	1.5	0.83	167.0	20.0	20.4	146.5	2.2	3.1	147.9	0.9	1.7	99	146.5	2.2	3.1
SK06-1C	2019	UCSB	Run 2	81	rim	N/A	N/A	1180	2	N/A	39.573	0.6	0.049	0.5	0.169	0.4	0.025	0.6	-0.06	123.0	11.0	11.4	160.9	0.9	2.6	158.8	0.7	1.7	101	160.9	0.9	2.6
SK06-1C	2019	UCSB	Run 2	82	core	N/A	N/A	1172	17	N/A	28.744	2.8	0.059	1.7	0.283	4.2	0.035	2.8	0.99	570.0	38.0	40.6	220.4	6.0	6.9	253.0	9.7	10.0	87	220.4	6.0	6.9
SK06-1C	2019	UCSB	Run 2	83	core	N/A	N/A	98	5	N/A	100.381	0.8	0.049	5.7	0.067	5.2	0.010	0.8	-0.33	130.0	130.0	130.0	63.9	0.5	1.1	65.6	3.4	3.5	97	63.9	0.5	1.1
SK06-1C	2019	UCSB	Run 2	83	mantle	N/A	N/A	89	7	N/A	97.116	0.8	0.067	6.6	0.095	6.6	0.010	0.8	0.73	820.0	140.0	141.5	66.0	0.5	1.1	91.8	5.8	5.9	72	66.0	0.5	1.1
SK06-1C	2019	UCSB	Run 2	83	rim	N/A	N/A	179	7	N/A	97.276	1.0	0.049	1.8	0.069	2.5	0.010	1.0	0.33	156.0	41.0	41.2	65.9	0.7	1.2	67.8	1.6	1.7	97	65.9	0.7	1.2
SK06-1C	2019	UCSB	Run 2	84	core	N/A	N/A	169	2	N/A	39.293	0.6	0.050	1.7	0.174	1.8	0.025	0.6	0.38	186.0	40.0	40.3	162.0	1.0	2.6	163.0	2.7	3.2	99	162.0	1.0	2.6
SK06-1C	2019	UCSB	Run 2	84	rim	N/A	N/A	166	2	N/A	38.835	1.5	0.050	1.3	0.177	1.2	0.026	1.5	0.50	186.0	31.0	31.3	163.9	2.4	3.4	165.1	1.9	2.5	99	163.9	2.4	3.4
SK06-1C	2019	UCSB	Run 2	85	core	N/A	N/A	282	1	N/A	46.816	1.3	0.049	1.9	0.144	2.3	0.021	1.3	0.57	140.0	45.0	45.1	136.2	1.8	2.7	136.4	2.9	3.2	100	136.2	1.8	2.7
SK06-1C	2019	UCSB	Run 2	85	rim	N/A	N/A	325	40	N/A	130.124	0.5	0.049	2.5	0.052	2.5	0.008	0.5	0.72	142.0	55.0	55.1	49.4	0.2	0.8	51.2	1.2	1.3	96	49.4	0.2	0.8
SK06-1C	2019	UCSB	Run 2	86	core	N/A	N/A	546	5	N/A	74.555	0.6	0.174	0.9	0.322	1.5	0.013	0.6	1.00	2599.0	14.0	66.5	85.9	0.5	1.4	283.4	3.7	4.7	30	85.9	0.5	1.4
SK06-1C	2019	UCSB	Run 2	87	core	N/A	N/A	215	2	N/A	5.098	0.4	0.080	0.6	2.152	0.5	0.196	0.4	0.31	1188.0	11.0	31.7	1154.6	4.1	17.8	1165.7	3.6	12.2	99	1165.7	3.6	12.2
SK06-1C	2019	UCSB	Run 2	87	rim	N/A	N/A	97	4	N/A	8.703	2.3	0.078	1.5	1.238	0.9	0.115	2.3	0.77	1155.0	30.0	41.6	701.0	15.0	18.3	818.2	4.9	9.5	86	701.0	15.0	18.3
SK06-1C	2019	UCSB	Run 2	88	core	N/A	N/A	330	2	N/A	35.063	1.3	0.051	1.1	0.199	1.3	0.029	1.3	0.53	226.0	26.0	26.6	181.3	2.4	3.6	184.3	2.2	2.9	98	181.3	2.4	3.6
SK06-1C	2019	UCSB	Run 2	88	rim	N/A	N/A	491	2	N/A	33.400	1.0	0.049	0.5	0.204	1.2	0.030	1.0	0.69	163.0	11.0	11.7	190.2	2.0	3.5	188.5	2.0	2.7	101	190.2	2.0	3.5
SK06-1C	2019	UCSB	Run 2	89	core	N/A	N/A	990	13	N/A	93.941	0.6	0.047	0.8	0.069	0.8	0.011	0.6	0.74	63.0	18.0	18.1	68.3	0.4	1.1	67.9	0.5	0.8	101	68.3	0.4	1.1
SK06-1C	2019	UCSB	Run 2	89	rim	N/A	N/A	648	16	N/A	92.507	1.0	0.059	5.5	0.087	5.7	0.011	1.0	0.57	540.0	120.0	120.8	69.3	0.7	1.3	84.8	4.7	4.8	82	69.3	0.7	1.3
SK06-1C	2019	UCSB	Run 2	90	core	N/A	N/A	381	2	N/A	38.781	0.3	0.049	1.9	0.175	1.9	0.026	0.3	0.08	163.0	43.0	43.2	164.1	0.5	2.5	164.1	2.8	3.2	100	164.1	0.5	2.5
SK06-1C	2019	UCSB	Run 2	91	core	N/A	N/A	252	2	N/A	20.743	1.1	0.073	4.4	0.484	3.7	0.048	1.1	-0.71	1005.0	86.0	89.6	303.5	3.2	5.6	401.0	12.0	12.7	76	303.5	3.2	5.6
SK06-1C	2019	UCSB	Run 2	92	core	N/A	N/A	840	11	N/A	71.788	0.9	0.049	0.9	0.093	1.4	0.014	0.9	0.76	123.0	23.0	23.2	89.2	0.8	1.6	90.4	1.2	1.5	99	89.2	0.8	1.6
SK06-1C	2019	UCSB	Run 2	92	rim	N/A	N/A	1315	17	N/A	85.324	1.6	0.048	0.6	0.078	1.8	0.012	1.6	0.89	111.0	15.0	15.3	75.1	1.2	1.6	76.0	1.4	1.6	99	75.1	1.2	1.6
SK06-1C	2019	UCSB	Run 2	93	core	N/A	N/A	836	17	N/A	13.250	1.0	0.076	0.4	0.791	1.1	0.075	1.0	0.98	1098.0	8.1	28.6	469.0	4.3	8.2	591.8	4.8	7.6	79	469.0	4.3	8.2
SK06-																																

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ.*	Name [‡]	Zr # [‡]	loc.	f206c	²⁰⁶ Pb CPS	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ U	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ U	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK06-1C	2019	UCSB	Run 2	118	rim	N/A	N/A	247	3	N/A	39.714	1.4	0.050	2.4	0.175	2.3	0.025	1.4	0.64	202.0	54.0	54.2	160.3	2.2	3.3	163.6	3.5	3.9	98	160.3	2.2	3.3
SK06-1C	2019	UCSB	Run 2	119	core	N/A	N/A	912	40	N/A	62.617	0.9	0.055	1.7	0.121	2.3	0.016	0.9	0.59	399.0	39.0	40.3	102.2	1.0	1.8	115.6	2.5	2.8	88	102.2	1.0	1.8
SK06-1C	2019	UCSB	Run 2	119	mantle	N/A	N/A	1773	116	N/A	93.800	0.5	0.048	0.7	0.071	0.3	0.011	0.5	0.03	110.0	16.0	16.2	68.4	0.4	1.1	69.9	0.2	0.7	98	68.4	0.4	1.1
SK06-1C	2019	UCSB	Run 2	119	rim	N/A	N/A	1291	97	N/A	88.574	1.4	0.051	6.1	0.079	4.8	0.011	1.4	0.14	210.0	140.0	140.1	72.3	1.0	1.5	77.0	3.6	3.7	94	72.3	1.0	1.5
SK06-1C	2019	UCSB	Run 2	120	core	N/A	N/A	127	2	N/A	46.468	1.3	0.051	2.4	0.150	1.8	0.022	1.3	-0.17	213.0	57.0	57.2	137.2	1.7	2.7	142.0	2.4	2.8	97	137.2	1.7	2.7
SK06-1C	2019	UCSB	Run 2	120	mantle	N/A	N/A	135	2	N/A	48.876	1.7	0.051	2.9	0.145	3.0	0.020	1.7	0.49	247.0	66.0	66.3	130.6	2.1	2.9	137.1	3.9	4.1	95	130.6	2.1	2.9
SK06-1C	2019	UCSB	Run 2	120	rim	N/A	N/A	636	9	N/A	86.073	0.8	0.050	1.3	0.081	2.0	0.012	0.8	0.93	215.0	31.0	31.5	74.5	0.6	1.3	79.0	1.5	1.7	94	74.5	0.6	1.3
SK06-1C	2019	UCSB	Run 2	121	core	N/A	N/A	1199	17	N/A	42.553	16.2	0.073	4.8	0.240	20.8	0.024	16.2	1.00	1016.0	97.0	100.3	150.0	24.0	24.1	217.0	41.0	41.1	69	150.0	24.0	24.1
SK06-1C	2019	UCSB	Run 2	121	rim	N/A	N/A	767	12	N/A	19.802	3.8	0.094	2.1	0.656	5.6	0.051	3.8	0.99	1505.0	39.0	54.2	317.0	12.0	12.9	512.0	23.0	23.6	62	317.0	12.0	12.9
SK06-1C	2019	UCSB	Run 2	122	core	N/A	N/A	230	3	N/A	46.577	0.7	0.049	1.4	0.146	1.1	0.021	0.7	0.14	145.0	32.0	32.2	137.0	0.9	2.2	138.4	1.4	2.0	99	137.0	0.9	2.2
SK06-1C	2019	UCSB	Run 2	122	rim	N/A	N/A	1181	49	N/A	88.621	0.7	0.048	1.3	0.075	1.7	0.011	0.7	0.93	104.0	32.0	32.1	72.3	0.5	1.2	73.4	1.2	1.4	99	72.3	0.5	1.2
SK06-1C	2019	UCSB	Run 2	123	core	N/A	N/A	118	2	N/A	10.456	0.6	0.062	1.8	0.816	2.1	0.096	0.6	0.67	665.0	37.0	40.6	588.8	3.2	9.4	605.7	9.3	11.1	97	588.8	3.2	9.4
SK06-1C	2019	UCSB	Run 2	124	core	N/A	N/A	100	3	N/A	11.455	1.1	0.061	0.6	0.739	1.4	0.087	1.1	0.88	646.0	13.0	20.7	539.7	6.0	10.1	561.8	5.9	8.1	96	539.7	6.0	10.1
SK06-1C	2019	UCSB	Run 2	124	mantle	N/A	N/A	441	12	N/A	13.398	0.8	0.062	1.1	0.638	0.9	0.075	0.8	0.72	662.0	23.0	28.3	464.0	3.6	7.8	500.8	3.5	6.1	93	464.0	3.6	7.8
SK06-1C	2019	UCSB	Run 2	124	mantle	N/A	N/A	1306	52	N/A	78.802	1.7	0.050	0.9	0.088	2.0	0.013	1.7	0.92	203.0	20.0	20.6	81.3	1.4	1.9	85.8	1.7	1.9	95	81.3	1.4	1.9
SK06-1C	2019	UCSB	Run 2	124	rim	N/A	N/A	822	90	N/A	89.686	2.2	0.048	0.7	0.074	2.2	0.011	2.2	0.93	103.0	18.0	18.2	71.5	1.6	1.9	72.9	1.5	1.7	98	71.5	1.6	1.9
SK06-1C	2019	UCSB	Run 2	125	core	N/A	N/A	226	3	N/A	99.621	0.4	0.050	2.0	0.069	1.7	0.010	0.4	-0.18	185.0	46.0	46.2	64.4	0.3	1.0	67.9	1.2	1.4	95	64.4	0.3	1.0
SK06-1C	2019	UCSB	Run 2	126	core	N/A	N/A	107	2	N/A	45.086	1.2	0.050	1.8	0.153	1.7	0.022	1.2	0.08	185.0	41.0	41.3	141.4	1.7	2.7	144.4	2.3	2.7	98	141.4	1.7	2.7
SK06-1C	2019	UCSB	Run 2	127	core	N/A	N/A	109	5	N/A	29.214	0.5	0.051	2.6	0.241	2.7	0.034	0.5	0.23	232.0	62.0	62.3	217.0	1.1	3.4	219.3	5.4	5.8	99	217.0	1.1	3.4
SK06-1C	2019	UCSB	Run 2	128	core	N/A	N/A	3240	74	N/A	129.668	0.6	0.047	0.3	0.050	0.7	0.008	0.6	0.73	67.3	7.7	7.9	49.5	0.3	0.8	50.0	0.4	0.6	99	49.5	0.3	0.8
SK06-1C	2019	UCSB	Run 2	128	rim	N/A	N/A	1020	66	N/A	132.433	0.8	0.048	1.4	0.050	1.2	0.008	0.8	0.38	89.0	32.0	32.1	48.5	0.4	0.8	49.3	0.6	0.8	98	48.5	0.4	0.8
SK06-1C	2019	UCSB	Run 2	129	core	N/A	N/A	62	2	N/A	6.134	0.4	0.075	0.7	1.677	1.0	0.163	0.4	0.72	1057.0	15.0	30.4	973.5	3.6	15.0	999.9	6.2	11.8	97	973.5	3.6	15.0
SK06-1C	2019	UCSB	Run 2	130	core	N/A	N/A	284	2	N/A	41.305	1.2	0.050	1.0	0.169	0.9	0.024	1.2	0.42	216.0	24.0	24.6	154.2	1.9	3.0	158.5	1.4	2.1	97	154.2	1.9	3.0
SK06-1C	2019	UCSB	Run 2	131	core	N/A	N/A	78	2	N/A	102.807	0.9	0.057	3.7	0.076	4.1	0.010	0.9	0.37	477.0	83.0	83.9	62.4	0.6	1.1	74.8	2.9	3.0	83	62.4	0.6	1.1
SK06-1C	2019	UCSB	Run 2	131	rim	N/A	N/A	429	35	N/A	121.448	0.6	0.049	1.9	0.056	1.7	0.008	0.6	-0.14	153.0	44.0	44.2	52.9	0.3	0.9	55.2	0.9	1.1	96	52.9	0.3	0.9
SK06-1C	2019	UCSB	Run 2	132	core	N/A	N/A	519	2	N/A	39.683	5.6	0.050	1.8	0.174	6.9	0.025	5.6	0.98	189.0	41.0	41.3	160.5	8.5	8.8	163.0	11.0	11.1	98	160.5	8.5	8.8
SK06-1C	2019	UCSB	Run 2	133	core	N/A	N/A	439	5	N/A	15.279	1.1	0.103	1.0	0.928	1.7	0.065	1.1	0.93	1671.0	19.0	45.9	408.7	4.3	7.5	666.8	8.2	10.6	61	408.7	4.3	7.5
SK06-1C	2019	UCSB	Run 2	134	core	N/A	N/A	222	2	N/A	48.819	0.2	0.050	2.2	0.143	1.6	0.020	0.2	-0.32	192.0	51.0	51.2	130.7	0.3	2.0	135.7	2.1	2.5	96	130.7	0.3	2.0
SK06-1C	2019	UCSB	Run 2	135	core	N/A	N/A	80	3	N/A	5.543	0.6	0.076	0.5	1.888	0.7	0.180	0.6	0.60	1081.2	9.5	28.7	1069.0	6.3	17.2	1076.7	4.8	11.8	99	1076.7	4.8	11.8
SK06-1C	2019	UCSB	Run 2	135	rim	N/A	N/A	757	41	N/A	84.674	1.9	0.052	0.8	0.085	1.7	0.012	1.9	0.77	285.0	19.0	20.3	75.7	1.4	1.8	82.3	1.4	1.6	92	75.7	1.4	1.8
SK06-1C	2019	UCSB	Run 2	136	core	N/A	N/A	1026	3	N/A	63.091	2.5	0.050	0.9	0.109	3.4	0.016	2.5	0.96	171.0	21.0	21.4	101.3	2.5	2.9	105.3	3.4	3.6	96	101.3	2.5	2.9
SK06-1C	2019	UCSB	Run 2	137	core	N/A	N/A	231	2	N/A	14.620	3.2	0.061	1.1	0.582	3.4	0.068	3.2	0.96	653.0	23.0	28.2	427.0	13.0	14.5	466.0	13.0	13.8	92	427.0	13.0	14.5
SK06-1C	2019	UCSB	Run 2	137	mantle	N/A	N/A	1054	27	N/A	84.674	2.0	0.048	1.2	0.080	1.0	0.012	2.0	0.79	117.0	33.0	33.1	75.7	1.5	1.9	77.7	0.7	1.1	97	75.7	1.5	1.9
SK06-1C	2019	UCSB	Run 2	137	rim	N/A	N/A	362	45	N/A	97.466	1.2	0.053	2.5	0.075	3.4	0.010	1.2	0.82	331.0	68.0	68.5	65.8	0.8	1.2	73.0	2.3</					

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ. [†]	Name [‡]	Zr # [§]	loc.	f206c	²⁰⁶ Pb CPS	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK06-1C	2019	UCSB	Run 2	164	rim	N/A	N/A	600	22	N/A	91.659	1.1	0.051	2.4	0.076	1.1	0.011	1.1	-0.22	233.0	53.0	53.3	69.9	0.8	1.3	74.5	0.8	1.1	94	69.9	0.8	1.3
SK06-1C	2019	UCSB	Run 2	165	core	N/A	N/A	386	2	N/A	43.879	1.5	0.065	2.9	0.204	4.1	0.023	1.5	0.92	762.0	62.0	64.9	145.3	2.2	3.1	188.8	7.0	7.3	77	145.3	2.2	3.1
SK06-1C	2019	UCSB	Run 2	166	core	N/A	N/A	555	7	N/A	93.197	0.9	0.047	1.6	0.069	1.3	0.011	0.9	0.57	47.0	37.0	37.0	68.8	0.7	1.2	68.2	0.9	1.1	101	68.8	0.7	1.2
SK06-1C	2019	UNCR	Run 2	166	rim	N/A	N/A	1059	10	N/A	94.029	0.7	0.049	1.3	0.072	1.4	0.011	0.7	0.26	132.0	30.0	30.2	68.2	0.5	1.1	70.5	0.9	1.2	97	68.2	0.5	1.1
SK06-1C	2019	UNCR	Run 3	167	core	N/A	N/A	432	2	N/A	21.436	12.0	0.068	12.4	0.440	12.8	0.047	12.0	0.40	1012.9	208.3	305.0	293.1	34.2	34.2	363.6	39.3	45.8	81	293.1	34.2	34.2
SK06-1C	2019	UNNR	Run 3	168	core	N/A	N/A	167	3	N/A	54.065	11.0	0.067	25.7	0.160	25.8	0.018	11.0	0.22	1572.2	273.8	441.1	117.9	12.9	12.9	140.9	35.7	36.9	84	117.9	12.9	12.9
SK06-1C	2019	UNNR	Run 3	169	core	N/A	N/A	504	21	N/A	92.329	5.9	0.057	18.4	0.084	18.3	0.011	5.9	0.05	1114.5	236.1	340.4	69.4	4.0	4.0	83.4	15.3	16.3	83	69.4	4.0	4.0
SK06-1C	2019	UNNR	Run 3	170	core	N/A	N/A	338	12	N/A	73.321	11.9	0.056	37.0	0.097	35.9	0.014	11.9	0.09	1453.5	386.7	501.8	87.3	10.3	10.3	91.3	32.0	32.6	96	87.3	10.3	10.3
SK06-1C	2019	UNNR	Run 3	171	core	N/A	N/A	1129	11	N/A	83.326	6.0	0.039	16.8	0.065	17.6	0.012	6.0	0.26	749.0	235.5	287.4	76.9	4.6	4.6	63.3	10.9	11.6	121	76.9	4.6	4.6
SK06-1C	2019	UNNR	Run 3	172	core	N/A	N/A	1363	2	N/A	15.228	4.7	0.062	4.5	0.566	5.9	0.066	4.7	0.67	656.2	88.6	169.4	409.6	18.7	18.7	452.2	21.2	36.2	91	409.6	18.7	18.7
SK06-1C	2019	UNNR	Run 3	173	core	N/A	N/A	1195	44	N/A	90.329	5.4	0.048	14.3	0.070	13.2	0.011	5.4	0.07	945.5	232.9	312.3	71.0	3.8	3.8	68.2	8.7	9.7	104	71.0	3.8	3.8
SK06-1C	2019	UNNR	Run 3	174	core	N/A	N/A	389	68	N/A	92.413	9.2	0.073	24.0	0.098	23.3	0.011	9.2	0.03	1830.0	302.7	503.7	69.3	6.4	6.4	95.5	22.1	23.0	73	69.3	6.4	6.4
SK06-1C	2019	UNNR	Run 3	175	core	N/A	N/A	1050	16	N/A	99.243	5.2	0.044	16.6	0.062	16.3	0.010	5.2	0.00	954.7	223.8	306.9	64.6	3.3	3.3	60.5	9.7	10.5	107	64.6	3.3	3.3
SK06-1C	2019	UNNR	Run 3	176	core	N/A	N/A	199	2	N/A	38.000	6.6	0.057	22.6	0.201	24.5	0.026	6.6	0.29	1302.0	295.3	411.4	167.3	10.8	10.8	173.7	39.3	40.9	96	167.3	10.8	10.8
SK06-1C	2019	UNNR	Run 3	177	core	N/A	N/A	1302	72	N/A	90.369	4.9	0.059	10.7	0.091	10.4	0.011	4.9	0.19	911.4	167.2	261.1	70.9	3.5	3.5	87.5	8.7	10.4	81	70.9	3.5	3.5
SK06-1C	2019	UNNR	Run 3	178	core	N/A	N/A	1913	11	N/A	95.992	6.0	0.050	12.8	0.072	12.4	0.010	6.0	0.31	719.7	167.2	230.3	66.8	4.0	4.0	69.6	8.4	9.6	96	66.8	4.0	4.0
SK06-1C	2019	UNNR	Run 3	179	core	N/A	N/A	482	2	N/A	32.959	5.0	0.060	11.7	0.253	11.7	0.030	5.0	0.23	969.4	169.7	272.5	192.6	9.4	9.4	225.1	23.8	27.9	86	192.6	9.4	9.4
SK06-1C	2019	UNNR	Run 3	180	core	N/A	N/A	625	2	N/A	9.140	6.9	0.065	8.6	1.015	7.3	0.109	6.9	0.35	802.8	156.8	236.2	668.2	43.6	43.6	705.8	37.6	59.3	95	668.2	43.6	43.6
SK06-1C	2019	UNNR	Run 3	181	core	N/A	N/A	647	3	N/A	24.954	11.5	0.056	21.7	0.325	24.5	0.040	11.5	0.42	856.8	349.8	397.4	253.0	28.4	28.4	277.7	58.4	61.2	91	253.0	28.4	28.4
SK06-1C	2019	UNNR	Run 3	182	core	N/A	N/A	719	25	N/A	88.865	6.1	0.069	18.5	0.103	16.6	0.011	6.1	-0.12	1405.9	256.4	401.7	72.1	4.3	4.3	97.4	15.5	16.7	74	72.1	4.3	4.3
SK06-1C	2020	UCSB	Run 1	167	core	N/A	N/A	269	1	N/A	12.771	2.7	0.059	1.2	0.630	1.9	0.078	2.7	0.93	562.0	26.0	31.0	486.0	13.0	13.0	496.3	7.4	7.4	98	486.0	13.0	13.0
SK06-1C	2020	UCSB	Run 1	171	rim	N/A	N/A	397	2	N/A	42.733	3.1	0.050	1.9	0.162	3.8	0.024	3.1	0.88	197.0	39.0	39.4	150.4	4.6	4.6	152.6	5.3	5.3	99	150.4	4.6	4.6
SK06-1C	2020	UCSB	Run 1	173	rim	N/A	N/A	913	21	N/A	83.682	2.5	0.048	1.4	0.080	2.5	0.012	2.5	0.87	99.0	32.0	32.1	76.6	1.9	1.9	77.9	1.9	1.9	98	76.6	1.9	1.9
SK06-1C	2020	UCSB	Run 1	173	mantle	N/A	N/A	208	2	N/A	43.706	3.3	0.049	2.5	0.154	3.6	0.023	3.3	0.69	130.0	59.0	59.1	145.8	4.8	4.8	145.1	4.9	4.9	100	145.8	4.8	4.8
SK06-1C	2020	UCSB	Run 1	175	rim	N/A	N/A	877	11	N/A	93.633	3.1	0.047	1.4	0.070	3.6	0.011	3.1	0.89	59.0	33.0	33.0	68.5	2.1	2.1	68.5	2.4	2.4	100	68.5	2.1	2.1
SK06-1C	2020	UCSB	Run 1	177	rim	N/A	N/A	1322	99	N/A	90.909	2.6	0.047	1.6	0.072	3.5	0.011	2.6	0.90	67.0	38.0	38.1	70.5	1.9	1.9	70.4	2.4	2.4	100	70.5	1.9	1.9
SK06-1C	2020	UCSB	Run 1	52	rim	N/A	N/A	114	7	N/A	94.697	4.1	0.046	2.6	0.070	3.4	0.011	4.1	0.54	16.0	56.0	56.0	67.7	2.7	2.7	68.3	2.3	2.3	99	67.7	2.7	2.7
SK06-1C	2020	UCSB	Run 1	85	rim	N/A	N/A	344	51	N/A	128.700	2.2	0.048	3.3	0.053	4.4	0.008	2.2	0.80	105.0	77.0	77.1	49.9	1.1	1.1	52.0	2.2	2.2	96	49.9	1.1	1.1
SK06-1C	2020	UCSB	Run 1	107	rim	N/A	N/A	381	7	N/A	48.170	2.7	0.053	1.9	0.151	3.8	0.021	2.7	0.83	306.0	44.0	44.9	132.4	3.6	3.6	143.0	5.0	5.0	93	132.4	3.6	3.6
SK06-1C	2020	UCSB	Run 1	145	rim	N/A	N/A	60	8	N/A	98.328	3.3	0.046	8.6	0.066	9.4	0.010	3.3	0.34	20.0	180.0	180.0	65.2	2.1	2.1	64.8	5.9	5.9	101	65.2	2.1	2.1
SK06-1C	2020	UCSB	Run 1	143	rim	N/A	N/A	463	1	N/A	24.691	2.7	0.052	1.6	0.288	2.4	0.041	2.7	0.80	263.0	37.0	37.8	256.2	6.9	6.9	256.6	5.5	5.5	100	256.2	6.9	6.9
SK06-1C	2020	UCSB	Run 1	162	rim	N/A	N/A	101	7	N/A	101.317	3.1	0.055	5.5	0.074	5.3	0.010	3.1	0.31	390.0	120.0	120.6	63.3	1.9	1.9	72.3	3.6	3.6	88	63.3	1.9	1.9
SK06-1C	2020	UCSB	Run 1	183	rim	N/A	N/A	1814	26	N/A	60.938	2.0	0.056	0.6	0.126	2.2	0.016	2.0	0.97	438.0	13.0	18.5	104.9	2.0	2.0	120.0	2.5	2.5	87	104.9	2.0	2.0
SK19-123	2019	UNNR	Run 3	1	core	N/A	N/A	38	3	N/A	68.255	17.8	0.091	165.8	0.232	61.9	0.015	17.8	-0.19	2691.4	452.3	7										

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ. [†]	Name [‡]	Zr # [§]	loc.	f206c	²⁰⁶ Pb CPs	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK19-123	2019	UNR	Run 3	44	core	N/A	N/A	348	12	N/A	65.998	7.7	0.058	27.4	0.144	31.8	0.015	7.7	0.24	1562.0	466.0	579.0	96.9	7.4	7.4	129.2	38.1	39.0	75	96.9	7.4	7.4
SK19-123	2019	UNR	Run 3	45	core	N/A	N/A	1235	2	N/A	53.877	5.7	0.050	10.9	0.129	10.7	0.019	5.7	0.20	700.2	142.7	210.0	118.5	6.7	6.7	122.3	12.5	14.8	97	118.5	6.7	6.7
SK19-123	2019	UNR	Run 3	46	core	N/A	N/A	107	3	N/A	62.841	10.7	0.035	101.7	0.049	108.9	0.016	10.7	0.14	1812.0	432.7	588.4	101.6	10.8	10.8	29.3	50.0	50.0	347	101.6	10.8	10.8
SK19-123	2019	UNR	Run 3	47	core	N/A	N/A	86	2	N/A	39.871	11.4	0.017	144.3	0.073	112.0	0.025	11.4	0.00	1712.9	565.2	679.3	159.3	17.9	17.9	33.1	73.4	73.4	482	159.3	17.9	17.9
SK19-123	2019	UNR	Run 3	48	core	N/A	N/A	573	1	N/A	52.835	6.9	0.046	16.5	0.131	16.7	0.019	6.9	0.14	1046.1	303.5	380.9	120.8	8.3	8.3	122.0	19.2	20.8	99	120.8	8.3	8.3
SK19-123	2019	UNR	Run 3	49	core	N/A	N/A	78	8	N/A	71.761	23.2	0.013	2586.3	0.246	52.4	0.014	23.2	0.07	2693.5	530.4	795.3	88.9	20.5	20.5	171.6	112.5	113.0	52	88.9	20.5	20.5
SK19-123	2019	UNR	Run 3	50	core	N/A	N/A	108	4	N/A	43.116	9.0	0.063	38.0	0.201	34.4	0.023	9.0	0.29	1793.8	368.3	539.8	147.6	13.1	13.1	162.3	55.7	56.7	91	147.6	13.1	13.1
SK19-123	2019	UNR	Run 3	51	core	N/A	N/A	176	4	N/A	59.959	5.7	0.074	33.1	0.165	29.5	0.017	5.7	0.18	1809.5	396.0	561.5	106.6	6.0	6.0	142.9	40.2	41.3	75	106.6	6.0	6.0
SK19-123	2019	UNR	Run 3	52	core	N/A	N/A	367	2	N/A	45.515	6.1	0.035	20.0	0.113	22.3	0.022	6.1	0.10	842.9	248.7	310.2	140.0	8.4	8.4	105.1	22.4	23.4	133	140.0	8.4	8.4
SK19-123	2019	UNR	Run 3	53	core	N/A	N/A	210	2	N/A	56.944	7.0	0.061	23.3	0.149	22.3	0.018	7.0	-0.06	1435.2	284.1	424.8	112.2	7.8	7.8	134.5	29.4	30.6	83	112.2	7.8	7.8
SK19-123	2019	UNR	Run 3	54	core	N/A	N/A	341	3	N/A	41.083	6.8	0.062	17.2	0.216	16.7	0.024	6.8	0.10	1042.6	246.4	336.6	154.9	10.5	10.5	193.4	30.3	32.8	80	154.9	10.5	10.5
SK19-123	2019	UNR	Run 3	55	core	N/A	N/A	129	3	N/A	52.426	9.7	0.010	260.1	0.024	243.6	0.019	9.7	0.04	2348.7	474.4	701.4	121.6	11.7	11.7	11.1	58.2	58.2	1094	121.6	11.7	11.7
SK19-123	2019	UNR	Run 3	56	core	N/A	N/A	211	2	N/A	43.173	9.5	0.068	28.3	0.213	25.8	0.023	9.5	0.10	1747.1	347.0	517.9	147.4	13.8	13.8	182.1	44.9	46.5	81	147.4	13.8	13.8
SK19-123	2019	UNR	Run 3	57	core	N/A	N/A	173	1	N/A	49.023	9.1	0.125	20.5	0.346	19.7	0.020	9.1	0.31	2190.6	263.3	549.2	130.0	11.7	11.7	282.2	50.2	53.5	46	130.0	11.7	11.7
SK19-123	2019	UNR	Run 3	58	core	N/A	N/A	231	2	N/A	53.139	8.1	0.054	30.2	0.149	29.5	0.019	8.1	-0.04	1647.2	381.2	526.0	120.1	9.7	9.7	130.4	37.8	38.7	92	120.1	9.7	9.7
SK19-123	2019	UNR	Run 3	59	core	N/A	N/A	210	2	N/A	47.829	7.5	0.074	24.9	0.211	22.6	0.021	7.5	0.02	1679.4	306.9	480.3	133.3	9.9	9.9	182.7	39.1	40.9	73	133.3	9.9	9.9
SK19-123	2019	UNR	Run 3	60	core	N/A	N/A	104	2	N/A	43.280	13.7	-0.017	-217.8	0.025	385.4	0.023	13.7	0.04	2226.5	1314.1	1402.4	147.0	19.9	19.9	-10.6	91.5	-91.5	-1385	147.0	19.9	19.9
SK19-123	2019	UNR	Run 3	61	core	N/A	N/A	115	2	N/A	41.483	9.9	0.038	68.4	0.103	64.6	0.024	9.9	0.02	1834.8	434.9	593.3	153.3	15.0	15.0	83.1	62.9	63.1	184	153.3	15.0	15.0
SK19-123	2019	UNR	Run 3	62	core	N/A	N/A	95	3	N/A	56.336	10.7	-0.025	-114.9	-0.063	-83.7	0.018	10.7	0.00	1994.8	617.4	757.5	113.3	12.1	12.1	-89.7	55.4	-55.7	-126	113.3	12.1	12.1
SK19-123	2019	UNR	Run 3	63	core	N/A	N/A	250	1	N/A	43.904	6.9	0.049	28.5	0.149	27.3	0.023	6.9	-0.03	1465.9	224.4	392.9	145.1	9.8	9.8	130.9	36.3	37.3	111	145.1	9.8	9.8
SK19-123	2019	UNR	Run 3	64	core	N/A	N/A	123	3	N/A	55.245	10.0	0.073	48.7	0.151	37.3	0.018	10.0	-0.18	1591.8	417.3	544.7	115.5	11.5	11.5	125.7	47.2	47.9	92	115.5	11.5	11.5
SK19-123	2019	UNR	Run 3	65	core	N/A	N/A	150	2	N/A	40.676	9.4	0.045	37.3	0.154	33.9	0.025	9.4	0.23	1804.4	430.8	585.8	156.3	14.5	14.5	139.0	46.7	47.6	112	156.3	14.5	14.5
SK19-123	2019	UNR	Run 3	66	core	N/A	N/A	84	3	N/A	45.253	11.8	0.078	53.1	0.211	49.4	0.022	11.8	0.01	2443.9	450.1	701.2	140.6	16.4	16.4	164.5	84.5	85.2	85	140.6	16.4	16.4
SK19-123	2019	UNR	Run 3	67	core	N/A	N/A	188	4	N/A	42.408	7.3	0.029	56.2	0.113	48.1	0.024	7.3	0.13	1511.5	446.3	556.6	150.1	10.9	10.9	91.9	46.1	46.5	163	150.1	10.9	10.9
SK19-123	2019	UNR	Run 3	68	core	N/A	N/A	548	1	N/A	49.727	6.2	0.057	15.4	0.165	17.0	0.020	6.2	0.25	1018.2	230.4	321.4	128.3	7.8	7.8	152.2	24.2	26.1	84	128.3	7.8	7.8
SK19-123	2019	UNR	Run 3	69	core	N/A	N/A	457	2	N/A	43.786	5.6	0.047	17.4	0.162	17.9	0.023	5.6	0.11	1195.8	266.2	374.2	145.5	8.0	8.0	147.9	24.8	26.6	98	145.5	8.0	8.0
SK19-123	2019	UNR	Run 3	70	core	N/A	N/A	93	3	N/A	30.615	9.3	0.059	28.2	0.262	26.9	0.033	9.3	-0.15	1515.8	308.6	454.4	206.8	19.0	19.0	212.4	56.0	57.6	97	206.8	19.0	19.0
SK19-123	2019	UNR	Run 3	71	core	N/A	N/A	254	1	N/A	52.413	7.2	0.038	30.9	0.111	28.0	0.019	7.2	0.30	1243.0	299.4	405.5	121.7	8.7	8.7	101.3	27.9	28.6	120	121.7	8.7	8.7
SK19-123	2019	UNR	Run 3	72	core	N/A	N/A	592	6	N/A	62.072	5.7	0.057	15.8	0.129	14.6	0.016	5.7	-0.08	1033.7	224.1	319.3	103.0	5.8	5.8	121.0	16.8	18.5	85	103.0	5.8	5.8
SK19-123	2019	UNR	Run 3	73	core	N/A	N/A	130	2	N/A	52.999	9.2	0.028	89.3	0.073	78.2	0.019	9.2	-0.11	1751.3	514.8	643.0	120.4	11.0	11.0	60.8	54.6	54.8	198	120.4	11.0	11.0
SK19-123	2019	UNR	Run 3	74	core	N/A	N/A	221	6	N/A	50.012	6.8	0.070	23.8	0.184	21.9	0.020	6.8	0.38	1390.2	288.3	420.3	127.6	8.5	8.5	163.8	33.7	35.3	78	127.6	8.5	8.5
SK19-123	2019	UNR	Run 3	75	core	N/A	N/A	2692	7	N/A	43.644	5.1	0.052	6.2	0.171	7.4	0.023	5.1	0.53	561.6	92.3	154.2	146.0	7.4	7.4	159.0	10.9	15.0	92	146.0	7.4	7.4
SK19-123	2019	UNR	Run 3	76	core	N/A	N/A	352	2	N/A	55.048	8.7	0.043	27.2	0.112	25.4	0.018	8.7	0.11	1333.5	333.4	444.1	115.9	10.0	10.0							

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ. [†]	Name [‡]	Zr # [§]	loc.	f206c	²⁰⁶ Pb CPS	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK19-123	2019	UNR	Run 3	121	core	N/A	N/A	321	3	N/A	39.363	7.6	0.056	18.4	0.191	19.4	0.025	7.6	0.21	1030.5	248.1	336.1	161.6	12.1	12.1	172.2	31.2	33.1	94	161.6	12.1	12.1
SK19-123	2019	UNR	Run 3	122	core	N/A	N/A	269	2	N/A	46.720	6.1	0.059	20.1	0.174	19.1	0.021	6.1	0.07	1277.6	271.2	390.6	136.4	8.2	8.2	162.6	30.5	32.3	84	136.4	8.2	8.2
SK19-123	2019	UNR	Run 3	123	core	N/A	N/A	131	3	N/A	48.742	10.6	0.027	76.8	0.095	55.0	0.021	10.6	0.13	1529.5	446.7	559.3	130.7	13.7	13.7	75.5	46.7	47.0	173	130.7	13.7	13.7
SK19-123	2019	UNR	Run 3	124	core	N/A	N/A	40	3	N/A	60.795	17.7	0.164	105.2	0.184	84.1	0.016	17.7	-0.08	3073.0	383.3	777.2	104.8	18.4	18.4	66.4	135.0	135.0	158	104.8	18.4	18.4
SK19-123	2019	UNR	Run 3	125	core	N/A	N/A	151	4	N/A	40.547	10.5	0.042	47.3	0.135	44.3	0.025	10.5	0.16	1647.8	406.1	544.4	161.0	18.1	18.1	113.9	52.7	53.2	141	161.0	18.1	18.1
SK19-123	2019	UNR	Run 3	126	core	N/A	N/A	176	4	N/A	69.226	9.6	0.057	39.4	0.105	35.7	0.014	9.6	-0.02	1882.2	395.3	572.5	92.4	8.8	8.8	92.5	33.6	34.2	100	92.4	8.8	8.8
SK19-123	2019	UNR	Run 3	127	core	N/A	N/A	387	2	N/A	44.323	6.8	0.049	15.8	0.158	15.9	0.023	6.8	0.23	915.8	241.8	314.7	143.7	9.6	9.6	145.2	21.5	23.5	99	143.7	9.6	9.6
SK19-123	2019	UNR	Run 3	128	core	N/A	N/A	404	4	N/A	45.642	6.9	0.053	17.9	0.155	17.4	0.022	6.9	-0.06	1081.3	235.7	334.8	139.6	9.5	9.5	142.5	23.3	25.1	98	139.6	9.5	9.5
SK19-123	2019	UNR	Run 3	129	core	N/A	N/A	129	3	N/A	42.232	8.4	0.061	31.8	0.184	29.7	0.024	8.4	0.08	1691.5	362.7	519.7	150.7	12.5	12.5	157.6	45.1	46.3	96	150.7	12.5	12.5
SK19-123	2019	UNR	Run 3	130	core	N/A	N/A	326	2	N/A	56.233	6.5	0.059	19.0	0.147	19.3	0.018	6.5	-0.06	1505.3	175.9	375.0	113.6	7.3	7.3	134.5	24.8	26.3	84	113.6	7.3	7.3
SK19-123	2019	UNR	Run 3	131	core	N/A	N/A	861	1	N/A	46.568	6.4	0.048	10.0	0.141	11.4	0.021	6.4	0.48	622.0	169.9	218.2	136.9	8.7	8.7	135.1	15.1	17.4	101	136.9	8.7	8.7
SK19-123	2019	UNR	Run 3	132	core	N/A	N/A	125	8	N/A	61.210	9.4	0.035	69.6	0.085	66.3	0.016	9.4	-0.14	1979.4	387.5	582.9	104.4	9.8	9.8	63.1	50.7	50.8	165	104.4	9.8	9.8
SK19-123	2019	UNR	Run 3	133	core	N/A	N/A	99	4	N/A	45.868	8.9	0.070	42.1	0.188	34.1	0.022	8.9	-0.02	1919.4	404.8	585.0	138.9	12.3	12.3	153.1	53.6	54.5	91	138.9	12.3	12.3
SK19-123	2019	UNR	Run 3	134	core	N/A	N/A	82	3	N/A	41.179	8.5	0.006	375.9	-0.014	-427.9	0.024	8.5	-0.15	1635.2	542.0	650.5	154.5	13.0	13.0	-29.7	67.4	-67.4	-520	154.5	13.0	13.0
SK19-123	2019	UNR	Run 3	135	core	N/A	N/A	106	3	N/A	41.024	9.3	0.013	122.5	0.037	138.6	0.024	9.3	-0.01	1169.0	353.7	437.3	155.0	14.2	14.2	16.9	50.2	50.3	918	155.0	14.2	14.2
SK19-123	2019	UNR	Run 3	136	core	N/A	N/A	963	3	N/A	43.104	6.6	0.057	10.4	0.179	10.9	0.023	6.6	0.47	869.7	165.1	252.7	147.7	9.6	9.6	165.0	16.4	19.6	90	147.7	9.6	9.6
SK19-123	2019	UNR	Run 3	137	core	N/A	N/A	112	2	N/A	45.596	9.4	0.034	62.1	0.075	72.7	0.022	9.4	0.02	1431.4	428.5	531.8	139.7	13.0	13.0	62.5	54.3	54.5	223	139.7	13.0	13.0
SK19-123	2019	UNR	Run 3	138	core	N/A	N/A	112	3	N/A	45.325	8.3	0.082	28.1	0.233	26.6	0.022	8.3	-0.05	1953.9	347.4	552.7	140.5	11.6	11.6	207.3	53.5	55.1	68	140.5	11.6	11.6
SK19-123	2019	UNR	Run 3	139	core	N/A	N/A	203	2	N/A	51.950	8.8	0.079	25.4	0.221	24.7	0.019	8.8	-0.02	1742.9	385.3	543.6	122.8	10.7	10.7	188.9	42.6	44.3	65	122.8	10.7	10.7
SK19-123	2019	UNR	Run 3	140	core	N/A	N/A	470	2	N/A	59.508	6.2	0.060	18.0	0.145	19.0	0.017	6.2	0.08	1188.5	301.7	399.2	107.4	6.7	6.7	134.0	23.7	25.2	80	107.4	6.7	6.7
SK19-123	2019	UNR	Run 3	141	core	N/A	N/A	93	2	N/A	49.064	12.9	0.065	49.3	0.167	42.5	0.020	12.9	0.17	2229.9	407.5	637.7	129.7	16.5	16.5	129.0	59.2	59.8	101	129.7	16.5	16.5
SK19-123	2019	UNR	Run 3	142	core	N/A	N/A	114	5	N/A	42.958	10.0	0.039	44.2	0.125	45.0	0.023	10.0	-0.10	1781.6	472.6	614.0	148.1	14.6	14.6	110.8	50.4	50.9	134	148.1	14.6	14.6
SK19-123	2019	UNR	Run 3	143	core	N/A	N/A	359	2	N/A	56.030	9.4	0.047	33.8	0.116	32.7	0.018	9.4	-0.23	1384.8	425.8	523.6	114.0	10.6	10.6	106.6	33.9	34.6	107	114.0	10.6	10.6
SK19-123	2019	UNR	Run 3	144	core	N/A	N/A	7539	3	N/A	45.017	5.9	0.051	5.4	0.154	4.9	0.022	5.9	0.55	450.7	91.6	135.0	141.6	8.2	8.2	144.8	6.6	11.5	98	141.6	8.2	8.2
SK19-123	2019	UNR	Run 3	145	core	N/A	N/A	2247	1	N/A	58.121	4.6	0.047	8.0	0.114	8.9	0.017	4.6	0.43	555.4	128.1	177.0	109.9	5.0	5.0	109.3	9.2	11.6	101	109.9	5.0	5.0
SK19-123	2019	UNR	Run 3	146	core	N/A	N/A	82	2	N/A	49.094	11.4	0.021	110.0	0.076	86.8	0.020	11.4	0.18	1586.3	408.8	537.5	129.8	14.6	14.6	49.4	60.7	60.7	263	129.8	14.6	14.6
SK19-123	2019	UNR	Run 3	147	core	N/A	N/A	151	2	N/A	40.910	7.5	0.043	38.1	0.166	36.7	0.024	7.5	0.10	1596.3	328.6	480.9	155.5	11.6	11.6	136.0	50.9	51.7	114	155.5	11.6	11.6
SK19-123	2019	UNR	Run 3	148	core	N/A	N/A	53	3	N/A	45.730	13.4	0.033	122.4	0.091	118.2	0.022	13.4	-0.14	2241.1	477.1	686.1	139.0	18.4	18.4	49.5	119.2	119.3	281	139.0	18.4	18.4
SK19-123	2019	UNR	Run 3	149	core	N/A	N/A	147	3	N/A	45.941	9.9	0.050	36.5	0.123	34.6	0.022	9.9	-0.07	1729.1	370.2	530.8	138.6	13.6	13.6	122.1	43.5	44.2	113	138.6	13.6	13.6
SK19-123	2019	UNR	Run 3	150	core	N/A	N/A	78	3	N/A	54.176	10.6	0.048	67.7	0.134	60.1	0.018	10.6	-0.03	2266.6	373.5	623.0	117.7	12.4	12.4	105.0	71.2	71.6	112	117.7	12.4	12.4
SK19-123	2020	UCSB	Run 2	1	rim	N/A	N/A	57	4	N/A	41.684	2.5	0.045	5.8	0.148	6.3	0.024	2.5	0.30	-30.0	120.0	-120.0	152.8	3.8	3.8	140.1	8.3	8.3	109	152.8	3.8	3.8
SK19-123	2020	UCSB	Run 2	4	rim	N/A	N/A	152	3	N/A	48.123	3.2	0.047	3.2	0.132	4.2	0.021	3.2	0.55	50.0	70.0	74.0	132.6	3.4	3.4	125.5	3.5	3.5	106	132.6	3.4	3.4
SK19-123	2020	UCSB	Run 2	4	rim	N/A	N/A	171	5	N/A	49.776	2.7	0.047	1.6	0.133	3.9	0.020	2.7	0.69	69.0	37.0	66.1	128.2	3.								

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ. [†]	Name [‡]	Zr # [§]	loc.	f206c	²⁰⁶ Pb CPs	U (ppm)	Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)	Date (Ma)	Zs (ABS)		Zs _{total} (ABS)		
SK19-123	2020	UCSB	Run 2	154	core	N/A	N/A	1813	2	N/A	39.857	1.6	0.048	1.0	0.168	2.2	0.025	1.6	0.93	118.0	23.0	23.7	159.7	2.5	2.5	157.2	3.2	3.2	102	159.7	2.5	2.5
SK19-123	2020	UCSB	Run 2	155	core	N/A	N/A	288	3	N/A	49.407	2.7	0.048	2.0	0.135	3.5	0.020	2.7	0.81	113.0	47.0	47.3	129.2	3.4	3.4	128.9	4.2	4.2	100	129.2	3.4	3.4
SK19-09B	2019	UCSB	Run 1	1	core	N/A	N/A	56	5	N/A	24.752	1.7	0.078	14.1	0.436	15.1	0.040	1.7	0.93	1120.0	260.0	268.5	255.3	4.2	5.7	366.0	46.0	46.1	70	255.3	4.2	5.7
SK19-09B	2019	UCSB	Run 1	2	core	N/A	N/A	891	2	N/A	60.720	0.5	0.048	0.7	0.110	1.2	0.016	0.5	0.72	118.0	16.0	17.5	105.3	0.6	1.7	106.1	1.2	1.6	99	105.3	0.6	1.7
SK19-09B	2019	UCSB	Run 1	3	core	N/A	N/A	71	4	N/A	57.571	0.9	0.050	3.4	0.120	3.1	0.017	0.9	-0.18	189.0	78.0	78.8	111.0	0.9	1.9	115.2	3.4	3.6	96	111.0	0.9	1.9
SK19-09B	2019	UCSB	Run 1	4	core	N/A	N/A	21	8	N/A	26.295	1.0	0.053	5.1	0.275	5.5	0.038	1.0	0.47	300.0	120.0	121.3	240.6	2.4	4.3	246.0	12.0	12.2	98	240.6	2.4	4.3
SK19-09B	2019	UCSB	Run 1	4	rim	N/A	N/A	55	4	N/A	25.641	0.8	0.053	3.0	0.284	2.3	0.039	0.8	-0.14	343.0	66.0	69.1	246.6	1.9	4.2	256.1	6.2	6.7	96	246.6	1.9	4.2
SK19-09B	2019	UCSB	Run 1	5	core	N/A	N/A	69	1	N/A	8.496	0.6	0.071	1.1	1.162	1.5	0.118	0.6	0.73	969.0	22.0	62.2	717.3	3.8	11.4	782.7	8.3	11.4	92	717.3	3.8	11.4
SK19-09B	2019	UCSB	Run 1	5	rim	N/A	N/A	72	2	N/A	5.624	2.1	0.086	1.8	2.098	3.2	0.178	2.1	0.84	1326.0	34.0	86.5	1055.0	21.0	26.3	1148.0	22.0	24.8	92	1148.0	22.0	24.8
SK19-09B	2019	UCSB	Run 1	6	core	N/A	N/A	46	5	N/A	26.357	0.5	0.053	2.2	0.279	2.3	0.038	0.5	-0.03	341.0	51.0	55.0	240.1	1.1	3.8	249.6	5.0	5.6	96	240.1	1.1	3.8
SK19-09B	2019	UCSB	Run 1	7	core	N/A	N/A	77	2	N/A	26.638	1.1	0.053	2.3	0.273	1.7	0.038	1.1	-0.39	314.0	53.0	56.2	237.6	2.6	4.4	246.0	3.1	4.0	97	237.6	2.6	4.4
SK19-09B	2019	UCSB	Run 1	8	core	N/A	N/A	33	3	N/A	20.202	2.4	0.219	5.9	1.500	8.0	0.050	2.4	0.93	2967.0	95.0	201.8	311.7	7.6	8.9	927.0	49.0	49.9	34	311.7	7.6	8.9
SK19-09B	2019	UCSB	Run 1	9	core	N/A	N/A	32	6	N/A	26.998	0.6	0.053	3.2	0.268	3.3	0.037	0.6	0.55	341.0	89.0	91.3	234.5	1.3	3.8	240.8	7.1	7.5	97	234.5	1.3	3.8
SK19-09B	2019	UCSB	Run 1	9	mantle	N/A	N/A	39	7	N/A	26.667	1.6	0.052	4.0	0.268	4.9	0.038	1.6	0.57	297.0	89.0	90.8	237.3	3.7	5.1	241.0	10.0	10.3	98	237.3	3.7	5.1
SK19-09B	2019	UCSB	Run 1	9	rim	N/A	N/A	20	5	N/A	27.503	0.9	0.054	5.0	0.269	5.2	0.036	0.9	0.38	340.0	110.0	111.9	230.2	1.9	3.9	242.0	12.0	12.2	95	230.2	1.9	3.9
SK19-09B	2019	UCSB	Run 1	10	core	N/A	N/A	43	6	N/A	24.814	4.2	0.095	15.8	0.520	19.2	0.040	4.2	0.99	1620.0	390.0	401.9	255.0	10.0	10.7	424.0	67.0	67.1	60	255.0	10.0	10.7
SK19-09B	2019	UCSB	Run 1	11	core	N/A	N/A	56	7	N/A	26.795	0.9	0.056	1.8	0.288	1.5	0.037	0.9	-0.45	444.0	40.0	48.1	236.2	2.0	4.1	256.6	3.4	4.3	92	236.2	2.0	4.1
SK19-09B	2019	UCSB	Run 1	12	core	N/A	N/A	35	4	N/A	26.254	0.9	0.053	3.4	0.277	2.7	0.038	0.9	-0.42	328.0	78.0	80.4	241.0	2.3	4.3	248.2	6.0	6.5	97	241.0	2.3	4.3
SK19-09B	2019	UCSB	Run 1	12	rim	N/A	N/A	25	4	N/A	27.144	1.2	0.056	5.7	0.285	5.3	0.037	1.2	0.01	450.0	130.0	132.8	233.2	2.7	4.4	254.0	12.0	12.3	92	233.2	2.7	4.4
SK19-09B	2019	UCSB	Run 1	12	mantle	N/A	N/A	34	6	N/A	26.767	0.7	0.051	4.5	0.263	4.2	0.037	0.7	-0.41	240.0	110.0	110.9	236.5	1.8	4.0	236.7	9.1	9.4	100	236.5	1.8	4.0
SK19-09B	2019	UCSB	Run 1	13	core	N/A	N/A	63	3	N/A	26.860	1.1	0.061	5.4	0.313	5.4	0.037	1.1	-0.05	630.0	120.0	125.8	235.7	2.5	4.3	276.0	13.0	13.3	85	235.7	2.5	4.3
SK19-09B	2019	UCSB	Run 1	14	core	N/A	N/A	36	7	N/A	32.082	1.6	0.057	3.3	0.251	4.4	0.031	1.6	0.11	527.0	87.0	92.6	197.9	3.1	4.3	227.5	8.6	8.9	87	197.9	3.1	4.3
SK19-09B	2019	UCSB	Run 1	15	core	N/A	N/A	40	1	N/A	25.720	0.4	0.054	2.0	0.292	2.2	0.039	0.4	0.37	386.0	45.0	50.6	245.9	1.1	3.8	259.9	4.9	5.5	95	245.9	1.1	3.8
SK19-09B	2019	UCSB	Run 1	15	rim	N/A	N/A	44	1	N/A	26.199	1.0	0.053	2.6	0.281	3.1	0.038	1.0	0.56	343.0	57.0	60.6	241.5	2.3	4.3	251.7	7.0	7.4	96	241.5	2.3	4.3
SK19-09B	2019	UCSB	Run 1	16	core	N/A	N/A	45	4	N/A	26.130	0.7	0.054	3.0	0.283	2.9	0.038	0.7	0.05	359.0	67.0	70.4	242.1	1.6	4.0	253.2	6.5	7.0	96	242.1	1.6	4.0
SK19-09B	2019	UCSB	Run 1	16	mantle	N/A	N/A	56	5	N/A	26.525	0.8	0.052	1.4	0.271	1.3	0.038	0.8	-0.16	303.0	33.0	37.7	238.6	2.0	4.1	243.7	2.7	3.6	98	238.6	2.0	4.1
SK19-09B	2019	UCSB	Run 1	16	mantle	N/A	N/A	56	5	N/A	26.455	0.8	0.054	1.6	0.283	1.6	0.038	0.8	-0.16	377.0	37.0	43.4	239.2	2.0	4.1	252.7	3.6	4.4	95	239.2	2.0	4.1
SK19-09B	2019	UCSB	Run 1	16	rim	N/A	N/A	526	2	N/A	24.172	1.2	0.050	0.8	0.288	1.1	0.041	1.2	0.87	211.0	18.0	22.0	261.3	3.0	4.9	256.9	2.5	3.6	102	261.3	3.0	4.9
SK19-09B	2019	UCSB	Run 1	17	core	N/A	N/A	398	9	N/A	26.157	1.6	0.053	1.2	0.276	1.9	0.038	1.6	0.92	332.0	48.0	52.0	241.8	3.9	5.3	247.8	4.1	4.8	98	241.8	3.9	5.3
SK19-09B	2019	UCSB	Run 1	18	core	N/A	N/A	55	3	N/A	24.325	1.4	0.083	11.7	0.475	12.8	0.041	1.4	0.98	1320.0	270.0	281.4	259.7	3.5	5.2	392.0	42.0	42.2	66	259.7	3.5	5.2
SK19-09B	2019	UCSB	Run 1	19	core	N/A	N/A	258	6	N/A	28.852	2.1	0.055	1.7	0.262	3.6	0.035	2.1	0.76	392.0	38.0	44.7	219.7	4.6	5.7	236.1	7.6	8.0	93	219.7	4.6	5.7
SK19-09B	2019	UCSB	Run 1	20	core	N/A	N/A	39	6	N/A	27.027	0.8	0.052	3.8	0.268	3.5	0.037	0.8	-0.15	291.0	86.0	87.8	234.2	1.8	3.9	241.1	7.6	8.0	97	234.2	1.8	3.9
SK19-09B	2019	UCSB	Run 1	20	mantle	N/A	N/A	61	6	N/A	26.399	1.2	0.064	7.9	0.338	8.6	0.038	1.2	0.51	730.0	170.0	175.6	239.7	2.8	4.6	295.0	22.0	22.2	81	239.7	2.8	4.6
SK19-09B	2019	UCSB	Run 1	20	rim	N/A	N/A	57	5	N/A	26.504	0.6	0.054	3.0	0.283	3.1	0.038	0.6	0.57	369.0	66.0	69.6	238.7	1.3	3.8	253.0	6.9	7.3	94	238.7	1.3	3.8
SK19-09B																																

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ. [†]	Name [‡]	Zr # [‡]	loc.	f206c	²⁰⁶ Pb CPS	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK19-09B	2020	UCSB	Run 1	4	rim	N/A	N/A	68	4	N/A	26.178	2.9	0.049	5.3	0.255	3.9	0.038	2.9	0.11	140.0	120.0	120.1	242.0	6.5	6.5	230.9	8.4	8.4	105	242.0	6.5	6.5
SK19-09B	2020	UCSB	Run 1	3	rim	N/A	N/A	115	4	N/A	60.423	1.7	0.056	6.1	0.126	6.1	0.017	1.7	0.71	420.0	140.0	140.6	105.8	1.7	1.7	120.3	7.0	7.0	88	105.8	1.7	1.7
SK19-09B	2020	UCSB	Run 1	17	rim	N/A	N/A	125	3	N/A	25.727	2.2	0.064	4.7	0.350	5.4	0.039	2.2	0.62	744.0	99.0	101.5	245.8	5.2	5.2	305.0	15.0	15.0	81	245.8	5.2	5.2
SK19-09B	2020	UCSB	Run 1	23	rim	N/A	N/A	48	4	N/A	26.667	2.9	0.059	5.6	0.312	6.4	0.038	2.9	0.53	560.0	130.0	131.1	237.5	6.8	6.8	275.0	15.0	15.0	86	237.5	6.8	6.8
SK19-09B	2020	UCSB	Run 1	26	rim	N/A	N/A	57	3	N/A	23.866	3.8	0.060	8.0	0.353	7.1	0.042	3.8	0.31	580.0	160.0	160.9	265.0	10.0	10.0	307.0	19.0	19.0	86	265.0	10.0	10.0
SK19-09B	2020	UCSB	Run 1	31	rim	N/A	N/A	96	4	N/A	25.445	5.3	0.052	6.0	0.282	7.8	0.039	5.3	0.68	260.0	140.0	140.2	248.0	13.0	13.0	252.0	17.0	17.0	98	248.0	13.0	13.0
SK19-09B	2020	UCSB	Run 1	28	rim	N/A	N/A	85	4	N/A	27.056	2.3	0.050	2.8	0.255	3.7	0.037	2.3	0.61	173.0	66.0	66.2	234.0	5.2	5.2	230.2	7.6	7.6	102	234.0	5.2	5.2
SK19-09B	2020	UCSB	Run 1	28	rim	N/A	N/A	81	5	N/A	26.385	3.7	0.052	4.3	0.272	4.0	0.038	3.7	0.79	261.0	97.0	97.3	240.1	8.8	8.8	244.3	8.5	8.5	98	240.1	8.8	8.8
SK19-09B	2020	UCSB	Run 1	37	rim	N/A	N/A	91	5	N/A	26.247	3.4	0.057	3.0	0.304	3.3	0.038	3.4	0.68	485.0	66.0	67.6	240.7	8.3	8.3	269.6	7.8	7.8	89	240.7	8.3	8.3
SK19-07	2020	UCSB	Run 3	1	core	N/A	N/A	170	3	N/A	31.066	2.7	0.050	2.8	0.227	7.6	0.032	2.7	0.74	198.0	64.0	64.9	204.2	5.4	5.4	207.6	7.6	7.6	82	204.2	5.4	5.4
SK19-07	2020	UCSB	Run 3	1	rim	N/A	N/A	280	3	N/A	30.367	1.3	0.051	1.5	0.232	4.3	0.033	1.3	0.71	229.0	35.0	37.2	208.9	2.7	2.7	211.4	4.3	4.3	53	208.9	2.7	2.7
SK19-07	2020	UCSB	Run 3	2	core	N/A	N/A	62	2	N/A	37.037	2.0	0.050	5.4	0.192	8.1	0.027	2.0	0.33	200.0	120.0	120.5	171.8	3.4	3.4	178.5	8.1	8.1	85	171.8	3.4	3.4
SK19-07	2020	UCSB	Run 3	2	rim	N/A	N/A	135	2	N/A	36.510	1.9	0.051	2.4	0.192	3.3	0.027	1.9	0.38	218.0	57.0	58.2	174.2	3.3	3.3	178.0	3.3	3.3	42	174.2	3.3	3.3
SK19-07	2020	UCSB	Run 3	3	core	N/A	N/A	878	1	N/A	44.053	1.9	0.049	1.2	0.155	2.5	0.023	1.9	0.87	144.0	28.0	29.1	144.7	2.6	2.6	146.4	2.5	2.5	33	144.7	2.6	2.6
SK19-07	2020	UCSB	Run 3	3	rim	N/A	N/A	157	4	N/A	41.929	1.9	0.049	2.7	0.163	4.6	0.024	1.9	0.56	128.0	62.0	62.4	151.9	2.8	2.8	153.1	4.6	4.6	51	151.9	2.8	2.8
SK19-07	2020	UCSB	Run 3	4	core	N/A	N/A	163	2	N/A	45.704	1.9	0.049	3.0	0.149	4.5	0.022	1.9	0.65	153.0	70.0	70.5	139.5	2.6	2.6	140.9	4.5	4.5	50	139.5	2.6	2.6
SK19-07	2020	UCSB	Run 3	4	rim	N/A	N/A	218	2	N/A	44.484	1.3	0.049	1.7	0.154	2.8	0.022	1.3	0.59	138.0	40.0	40.7	143.3	1.9	1.9	145.3	2.8	2.8	35	143.3	1.9	1.9
SK19-07	2020	UCSB	Run 3	5	core	N/A	N/A	230	3	N/A	44.504	1.6	0.051	2.4	0.156	3.9	0.022	1.6	0.28	218.0	53.0	54.3	143.2	2.2	2.2	147.6	3.9	3.9	45	147.6	2.2	2.2
SK19-07	2020	UCSB	Run 3	6	core	N/A	N/A	82	3	N/A	49.140	1.5	0.047	6.6	0.131	7.9	0.020	1.5	0.19	30.0	140.0	140.0	129.9	1.9	1.9	124.9	7.9	7.9	81	124.9	1.9	1.9
SK19-07	2020	UCSB	Run 3	6	rim	N/A	N/A	77	2	N/A	51.151	1.7	0.048	4.0	0.129	4.6	0.020	1.7	0.27	73.0	87.0	87.1	124.8	2.1	2.1	123.2	4.6	4.6	50	124.8	2.1	2.1
SK19-07	2020	UCSB	Run 3	7	core	N/A	N/A	950	3	N/A	30.340	1.4	0.050	1.2	0.229	3.5	0.033	1.4	0.75	196.0	29.0	30.9	209.0	2.8	2.8	209.5	3.5	3.5	47	209.0	2.8	2.8
SK19-07	2020	UCSB	Run 3	8	rim	N/A	N/A	324	7	N/A	42.123	2.4	0.050	2.2	0.165	2.4	0.024	2.4	0.59	179.0	50.0	51.0	151.3	3.6	3.6	155.0	2.4	2.4	33	151.3	3.6	3.6
SK19-07	2020	UCSB	Run 3	8	rim	N/A	N/A	84	2	N/A	41.946	2.6	0.049	3.4	0.163	5.8	0.024	2.6	0.55	161.0	79.0	79.5	151.9	4.0	4.0	153.3	5.8	5.8	62	151.9	4.0	4.0
SK19-07	2020	UCSB	Run 3	8	core	N/A	N/A	260	2	N/A	38.153	2.1	0.050	1.9	0.182	4.2	0.026	2.1	0.70	175.0	43.0	44.1	166.8	3.5	3.5	169.4	4.2	4.2	49	166.8	3.5	3.5
SK19-07	2020	UCSB	Run 3	9	rim	N/A	N/A	93	3	N/A	43.103	1.5	0.048	1.7	0.157	3.7	0.023	1.5	0.47	114.0	40.0	40.5	147.8	2.2	2.2	148.4	3.7	3.7	43	147.8	2.2	2.2
SK19-07	2020	UCSB	Run 3	10	core	N/A	N/A	84	4	N/A	41.356	1.7	0.048	4.4	0.160	5.4	0.024	1.7	-0.03	96.0	97.0	97.1	154.0	2.6	2.6	150.3	5.4	5.4	59	154.0	2.6	2.6
SK19-07	2020	UCSB	Run 3	10	rim	N/A	N/A	154	2	N/A	38.008	2.0	0.051	2.6	0.185	4.1	0.026	2.0	0.14	213.0	61.0	62.1	167.4	3.3	3.3	172.4	4.1	4.1	48	167.4	3.3	3.3
SK19-07	2020	UCSB	Run 3	11	core	N/A	N/A	121	3	N/A	37.764	1.8	0.050	2.8	0.184	4.6	0.026	1.8	0.15	206.0	67.0	68.0	168.5	3.0	3.0	171.5	4.6	4.6	53	168.5	3.0	3.0
SK19-07	2020	UCSB	Run 3	11	rim	N/A	N/A	202	2	N/A	45.455	1.2	0.050	1.9	0.152	3.3	0.022	1.2	0.71	174.0	43.0	44.1	140.3	1.7	1.7	143.3	3.3	3.3	39	140.3	1.7	1.7
SK19-07	2020	UCSB	Run 3	12	core	N/A	N/A	140	2	N/A	45.872	1.9	0.051	3.1	0.149	5.0	0.022	1.9	0.41	227.0	73.0	74.1	139.0	2.6	2.6	141.1	5.0	5.0	54	139.0	2.6	2.6
SK19-07	2020	UCSB	Run 3	13	core	N/A	N/A	260	2	N/A	34.341	2.6	0.051	3.1	0.208	3.1	0.029	2.6	0.32	247.0	70.0	71.3	185.0	4.7	4.7	191.7	3.1	3.1	42	185.0	4.7	4.7
SK19-07	2020	UCSB	Run 3	14	core	N/A	N/A	747	3	N/A	33.058	2.8	0.050	1.2	0.208	6.1	0.030	2.8	0.89	203.0	28.0	30.1	192.1	5.3	5.3	192.0	6.1	6.1	67	192.1	5.3	5.3
SK19-07	2020	UCSB	Run 3	14	rim	N/A	N/A	105	5	N/A	44.307	1.6	0.048	4.4	0.150	5.0	0.023	1.6	-0.32	99.0	98.0	98.2	143.9	2.3	2.3	141.5	5.0	5.0	54	143.9	2.3	2.3
SK19-07	2020	UCSB	Run 3	15	core	N/A	N/A	134	2	N/A	46.125	3.5	0.049	2.2	0.146	4.2	0.022	3.5	0.78	160.0	58.0	58.7	138.3	4.7	4.7	137.9	4.2	4.2	47	138.3	4.7	4.7
SK19-																																

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ.*	Name [‡]	Zr # [§]	loc.	f206c	²⁰⁶ Pb CPS	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK19-07	2020	UCSB	Run 3	50	core	N/A	N/A	161	5	N/A	53.677	1.6	0.049	2.9	0.125	3.5	0.019	1.6	0.31	136.0	64.0	64.4	119.0	1.9	1.9	119.8	3.5	3.9	99	119.0	1.9	1.9
SK19-07	2020	UCSB	Run 3	51	core	N/A	N/A	211	2	N/A	37.453	2.4	0.049	1.7	0.182	5.2	0.027	2.4	0.72	168.0	40.0	41.1	169.9	4.1	4.1	169.6	5.2	5.8	100	169.9	4.1	4.1
SK19-07	2020	UCSB	Run 3	52	core	N/A	N/A	57	3	N/A	37.425	2.3	0.048	5.2	0.178	9.0	0.027	2.3	0.49	110.0	110.0	110.2	170.0	3.9	3.9	166.3	9.0	9.3	102	170.0	3.9	3.9
SK19-07	2020	UCSB	Run 3	53	core	N/A	N/A	96	2	N/A	43.271	1.9	0.049	3.2	0.157	4.1	0.023	1.9	0.06	157.0	75.0	75.5	147.3	2.8	2.8	147.9	4.1	4.7	100	147.3	2.8	2.8
SK19-07	2020	UCSB	Run 3	54	core	N/A	N/A	106	3	N/A	44.563	2.0	0.048	4.0	0.148	6.7	0.022	2.0	0.56	83.0	87.0	87.1	143.1	2.9	2.9	140.2	6.7	7.0	102	143.1	2.9	2.9
SK19-07	2020	UCSB	Run 3	55	rim	N/A	N/A	737	2	N/A	30.048	2.2	0.050	0.7	0.230	4.4	0.033	2.2	0.97	206.0	17.0	20.4	211.0	4.5	4.5	210.1	4.4	5.4	100	211.0	4.5	4.5
SK19-07	2020	UCSB	Run 3	55	core	N/A	N/A	3940	16	N/A	29.257	2.4	0.048	0.4	0.224	4.6	0.034	2.4	0.96	106.5	9.6	11.2	216.7	5.2	5.2	205.6	4.6	5.5	105	216.7	5.2	5.2
SK19-07	2020	UCSB	Run 3	56	core	N/A	N/A	142	3	N/A	42.790	1.6	0.048	2.3	0.153	4.5	0.023	1.6	0.58	87.0	59.0	59.2	148.9	2.3	2.3	144.5	4.5	5.0	103	148.9	2.3	2.3
SK19-07	2020	UCSB	Run 3	57	core	N/A	N/A	141	3	N/A	43.975	2.9	0.048	2.5	0.151	3.9	0.023	2.9	0.49	97.0	58.0	58.2	144.9	4.1	4.1	142.9	3.9	4.5	101	144.9	4.1	4.1
SK19-07	2020	UCSB	Run 3	58	core	N/A	N/A	235	8	N/A	53.022	3.4	0.048	2.7	0.119	3.3	0.019	3.4	0.76	71.0	61.0	61.1	120.4	4.1	4.1	114.4	3.3	3.7	105	120.4	4.1	4.1
SK19-07	2020	UCSB	Run 3	58	rim	N/A	N/A	177	5	N/A	52.466	2.4	0.048	3.1	0.124	3.2	0.019	2.4	0.14	93.0	70.0	70.2	121.7	2.9	2.9	118.4	3.2	3.7	103	121.7	2.9	2.9
SK19-07	2020	UCSB	Run 3	59	core	N/A	N/A	623	2	N/A	34.483	1.1	0.049	1.8	0.193	3.7	0.029	1.1	0.65	155.0	41.0	41.9	184.3	2.0	2.0	179.5	3.7	4.6	103	184.3	2.0	2.0
SK19-07	2020	UCSB	Run 3	60	core	N/A	N/A	47	4	N/A	26.947	2.2	0.051	4.5	0.258	10.0	0.037	2.2	0.25	240.0	110.0	110.8	234.9	5.1	5.1	232.0	10.0	10.6	101	234.9	5.1	5.1
SK19-07	2020	UCSB	Run 3	61	core	N/A	N/A	330	3	N/A	27.315	1.1	0.051	0.9	0.254	3.3	0.037	1.1	0.78	255.0	20.0	24.4	231.8	2.5	2.5	229.5	3.3	4.8	101	231.8	2.5	2.5
SK19-07	2020	UCSB	Run 3	62	core	N/A	N/A	149	2	N/A	40.967	1.8	0.049	3.3	0.161	6.3	0.024	1.8	0.74	143.0	76.0	76.4	155.5	2.8	2.8	151.3	6.3	6.7	103	155.5	2.8	2.8
SK19-07	2020	UCSB	Run 3	63	core	N/A	N/A	150	2	N/A	45.434	2.2	0.048	2.0	0.143	4.1	0.022	2.2	0.82	113.0	46.0	46.4	140.4	3.1	3.1	135.6	4.1	4.6	104	140.4	3.1	3.1
SK19-07	2020	UCSB	Run 3	63	rim	N/A	N/A	125	2	N/A	44.287	3.0	0.051	2.3	0.153	5.2	0.023	3.0	0.78	256.0	54.0	55.8	144.0	4.2	4.2	144.6	5.2	5.6	100	144.0	4.2	4.2
SK19-07	2020	UCSB	Run 3	64	core	N/A	N/A	336	1	N/A	46.468	1.5	0.049	2.9	0.143	3.2	0.022	1.5	0.32	143.0	67.0	67.5	137.3	2.0	2.0	135.8	3.2	3.8	101	137.3	2.0	2.0
SK19-07	2020	UCSB	Run 3	65	core	N/A	N/A	95	2	N/A	42.918	2.7	0.050	4.6	0.153	6.8	0.023	2.7	0.38	200.0	100.0	100.6	148.5	3.9	3.9	144.8	6.8	7.1	103	148.5	3.9	3.9
SK19-07	2020	UCSB	Run 3	66	core	N/A	N/A	71	3	N/A	35.149	2.9	0.051	3.7	0.189	6.5	0.028	2.9	0.37	230.0	83.0	84.0	180.8	5.2	5.2	176.1	6.5	7.0	103	180.8	5.2	5.2
SK19-07	2020	UCSB	Run 3	67	core	N/A	N/A	117	3	N/A	28.818	1.6	0.051	1.7	0.235	3.2	0.035	1.6	0.39	219.0	41.0	42.7	219.9	3.6	3.6	214.6	3.2	4.5	102	219.9	3.6	3.6
SK19-07	2020	UCSB	Run 3	68	core	N/A	N/A	58	3	N/A	48.379	1.8	0.049	6.4	0.138	9.1	0.021	1.8	0.24	120.0	140.0	140.2	131.9	2.3	2.3	131.2	9.1	9.3	101	131.9	2.3	2.3
SK19-07	2020	UCSB	Run 3	69	core	N/A	N/A	521	4	N/A	30.855	1.8	0.050	0.9	0.219	3.7	0.032	1.8	0.84	203.0	22.0	24.7	205.6	3.7	3.7	201.3	3.7	4.8	102	205.6	3.7	3.7
SK19-07	2020	UCSB	Run 3	70	core	N/A	N/A	79	2	N/A	41.203	2.5	0.050	3.6	0.164	5.7	0.024	2.5	0.51	191.0	80.0	80.7	154.6	3.8	3.8	154.4	5.7	6.2	100	154.6	3.8	3.8
SK19-07	2020	UCSB	Run 3	71	core	N/A	N/A	323	3	N/A	45.809	1.9	0.051	1.6	0.149	4.4	0.022	1.9	0.85	220.0	37.0	38.9	139.2	2.7	2.7	140.8	4.4	4.9	99	139.2	2.7	2.7
SK19-07	2020	UCSB	Run 3	72	core	N/A	N/A	1454	1	N/A	41.034	2.0	0.049	0.8	0.162	3.4	0.024	2.0	0.92	138.0	18.0	19.5	155.2	3.1	3.1	152.3	3.4	4.1	102	155.2	3.1	3.1
SK19-07	2020	UCSB	Run 3	73	core	N/A	N/A	103	2	N/A	42.355	2.2	0.049	3.8	0.158	5.8	0.024	2.2	0.42	160.0	88.0	88.4	150.4	3.4	3.4	148.5	5.8	6.2	101	150.4	3.4	3.4
SK19-07	2020	UCSB	Run 3	74	core	N/A	N/A	106	2	N/A	45.704	1.9	0.048	3.5	0.143	4.8	0.022	1.9	0.61	116.0	82.0	82.2	139.5	2.6	2.6	136.1	4.8	5.2	102	139.5	2.6	2.6
SK19-07	2020	UCSB	Run 3	75	core	N/A	N/A	214	2	N/A	48.709	1.5	0.048	1.2	0.137	2.2	0.021	1.5	0.53	105.0	29.0	29.6	131.0	2.0	2.0	130.2	2.2	2.9	101	131.0	2.0	2.0
SK19-07	2020	UCSB	Run 3	76	core	N/A	N/A	120	2	N/A	36.711	2.3	0.050	3.8	0.182	5.0	0.027	2.3	0.22	165.0	88.0	88.5	173.3	3.9	3.9	169.9	5.0	5.6	102	173.3	3.9	3.9
SK19-07	2020	UCSB	Run 3	77	core	N/A	N/A	1370	1	N/A	43.122	2.3	0.049	1.0	0.156	3.9	0.023	2.3	0.95	155.0	23.0	24.5	147.8	3.4	3.4	147.2	3.9	4.5	100	147.8	3.4	3.4
SK19-07	2020	UCSB	Run 3	78	core	N/A	N/A	75	2	N/A	36.832	1.4	0.047	3.0	0.176	7.2	0.027	1.4	0.25	57.0	67.0	67.1	172.7	2.4	2.4	164.9	7.2	7.6	105	172.7	2.4	2.4
SK19-07	2020	UCSB	Run 3	79	core	N/A	N/A	86	2	N/A	45.956	1.5	0.049	4.5	0.150	6.5	0.022	1.5	0.10	147.0	99.0	99.3	138.7	2.0	2.0	141.4	6.5	6.8	98	138.7	2.0	2.0
SK19-07	2020	UCSB	Run 3	80	core	N/A	N/A	78	2	N/A	37.189	3.5	0.051	4.1	0.188	7.1	0.027	3.5	0.43	232.0	95.0	95.9	171.0	5.8	5.8	174.6	7.1	7.6	98	171.0	5.8	

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ. [†]	Name [‡]	Zr # [§]	loc.	f206c	²⁰⁶ Pb CPS	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK19-07	2020	UCSB	Run 3	119	core	N/A	N/A	220	1	N/A	37.893	2.2	0.049	2.0	0.180	5.1	0.026	2.2	0.77	139.0	48.0	48.6	167.9	3.6	3.6	167.8	5.1	5.7	100	167.9	3.6	3.6
SK19-07	2020	UCSB	Run 3	120	core	N/A	N/A	135	2	N/A	45.977	1.7	0.049	3.7	0.147	5.8	0.022	1.7	0.70	136.0	82.0	82.3	138.7	2.3	2.3	139.3	5.8	6.2	100	138.7	2.3	2.3
SK19-07	2020	UCSB	Run 3	121	core	N/A	N/A	194	3	N/A	37.836	2.3	0.050	1.5	0.180	3.1	0.026	2.3	0.65	186.0	36.0	37.4	168.1	3.9	3.9	167.8	3.1	4.0	100	168.1	3.9	3.9
SK19-07	2020	UCSB	Run 3	122	core	N/A	N/A	455	1	N/A	44.743	2.0	0.049	1.7	0.151	3.7	0.022	2.0	0.88	148.0	40.0	40.8	142.5	2.8	2.8	142.8	3.7	4.3	100	142.5	2.8	2.8
SK19-07	2020	UCSB	Run 3	123	core	N/A	N/A	74	3	N/A	37.722	2.4	0.051	3.9	0.186	6.2	0.027	2.4	0.38	231.0	88.0	88.9	168.7	4.0	4.0	173.4	6.2	6.7	97	168.7	4.0	4.0
SK19-07	2020	UCSB	Run 3	124	core	N/A	N/A	969	2	N/A	40.900	2.3	0.050	1.1	0.167	2.7	0.024	2.3	0.88	178.0	25.0	26.8	155.7	3.5	3.5	157.1	2.7	3.6	99	155.7	3.5	3.5
SK19-07	2020	UCSB	Run 3	125	core	N/A	N/A	131	2	N/A	38.745	2.3	0.053	2.6	0.187	6.4	0.026	2.3	0.63	324.0	62.0	64.5	164.3	3.7	3.7	174.3	6.4	6.9	94	164.3	3.7	3.7
SK19-07	2020	UCSB	Run 3	126	core	N/A	N/A	100	3	N/A	47.192	3.6	0.050	3.6	0.148	7.0	0.021	3.6	0.77	187.0	81.0	81.7	135.2	4.8	4.8	139.8	7.0	7.3	97	135.2	4.8	4.8
SK19-07	2020	UCSB	Run 3	127	core	N/A	N/A	711	2	N/A	41.220	1.9	0.049	1.2	0.164	2.5	0.024	1.9	0.79	153.0	27.0	28.3	154.5	2.9	2.9	154.0	2.5	3.4	100	154.5	2.9	2.9
SK19-07	2020	UCSB	Run 3	128	core	N/A	N/A	300	3	N/A	38.655	1.7	0.050	2.0	0.176	3.9	0.026	1.7	0.58	177.0	46.0	47.0	164.6	2.7	2.7	164.6	3.9	4.6	100	164.6	2.7	2.7
SK19-07	2020	UCSB	Run 3	129	core	N/A	N/A	90	4	N/A	31.104	1.9	0.050	3.0	0.219	5.1	0.032	1.9	0.63	173.0	68.0	68.7	204.0	3.8	3.8	200.6	5.1	5.9	102	204.0	3.8	3.8
SK19-07	2020	UCSB	Run 3	130	core	N/A	N/A	103	4	N/A	30.516	2.5	0.049	2.9	0.221	5.4	0.033	2.5	0.53	163.0	75.0	75.5	207.9	5.2	5.2	202.5	5.4	6.2	103	207.9	5.2	5.2
SK19-07	2020	UCSB	Run 3	130	rim	N/A	N/A	98	3	N/A	31.338	1.8	0.051	2.8	0.226	7.8	0.032	1.8	0.80	249.0	58.0	59.6	202.5	3.6	3.6	206.9	7.8	8.4	98	202.5	3.6	3.6
SK19-07	2020	UCSB	Run 3	131	core	N/A	N/A	165	1	N/A	39.246	1.7	0.062	3.5	0.219	9.3	0.025	1.7	0.29	701.0	89.0	97.0	162.2	2.8	2.8	201.3	9.3	9.8	81	162.2	2.8	2.8
SK19-07	2020	UCSB	Run 3	132	core	N/A	N/A	158	3	N/A	39.541	2.7	0.050	1.9	0.172	4.9	0.025	2.7	0.84	193.0	40.0	41.4	161.0	4.3	4.3	160.7	4.9	5.5	100	161.0	4.3	4.3
SK19-07	2020	UCSB	Run 3	132	rim	N/A	N/A	108	2	N/A	34.710	2.7	0.054	4.1	0.213	9.5	0.029	2.7	0.67	343.0	92.0	93.9	183.1	4.8	4.8	195.6	9.5	9.9	94	183.1	4.8	4.8
SK19-07	2020	UCSB	Run 3	133	core	N/A	N/A	293	4	N/A	44.903	1.7	0.049	2.2	0.151	3.3	0.022	1.7	0.52	138.0	52.0	52.6	142.0	2.4	2.4	142.4	3.3	3.9	100	142.0	2.4	2.4
SK19-07	2020	UCSB	Run 3	134	core	N/A	N/A	164	3	N/A	38.835	2.0	0.048	3.4	0.172	5.4	0.026	2.0	0.15	75.0	77.0	77.1	163.9	3.2	3.2	160.8	5.4	5.9	102	163.9	3.2	3.2
SK19-07	2020	UCSB	Run 3	135	core	N/A	N/A	210	1	N/A	38.820	3.5	0.050	2.8	0.180	3.4	0.026	3.5	0.71	200.0	67.0	67.9	163.9	5.6	5.6	168.1	3.4	4.2	98	163.9	5.6	5.6
SK19-07	2020	UCSB	Run 4	136	core	N/A	N/A	1828	1	N/A	37.764	0.9	0.049	0.8	0.179	1.4	0.026	0.9	0.81	165.0	20.0	21.1	168.5	1.5	1.5	166.8	2.1	2.1	101	168.5	1.5	1.5
SK19-07	2020	UCSB	Run 4	137	core	N/A	N/A	127	2	N/A	37.936	0.9	0.051	2.6	0.182	2.6	0.026	0.9	0.23	219.0	61.0	61.6	167.7	1.6	1.6	169.9	4.1	4.1	99	167.7	1.6	1.6
SK19-07	2020	UCSB	Run 4	138	core	N/A	N/A	374	3	N/A	43.011	1.1	0.050	2.0	0.157	1.4	0.023	1.1	0.07	176.0	46.0	46.5	148.2	1.6	1.6	148.0	1.9	1.9	100	148.2	1.6	1.6
SK19-07	2020	UCSB	Run 4	139	core	N/A	N/A	257	2	N/A	38.241	1.5	0.050	1.9	0.181	1.0	0.026	1.5	0.08	212.0	43.0	43.8	166.4	2.4	2.4	168.8	1.6	1.6	99	166.4	2.4	2.4
SK19-07	2020	UCSB	Run 4	140	core	N/A	N/A	357	1	N/A	39.047	1.8	0.050	1.9	0.176	2.4	0.026	1.8	0.67	208.0	45.0	45.8	163.0	3.0	3.0	164.8	3.6	3.6	99	163.0	3.0	3.0
SK19-07	2020	UCSB	Run 4	141	core	N/A	N/A	328	4	N/A	53.996	1.2	0.049	2.5	0.123	2.0	0.019	1.2	-0.09	126.0	59.0	59.2	118.3	1.4	1.4	117.8	2.1	2.1	100	118.3	1.4	1.4
SK19-07	2020	UCSB	Run 4	142	core	N/A	N/A	307	1	N/A	41.220	1.0	0.049	2.0	0.161	2.7	0.024	1.0	0.92	131.0	46.0	46.3	154.5	1.6	1.6	151.3	3.8	3.8	102	154.5	1.6	1.6
SK19-07	2020	UCSB	Run 4	143	core	N/A	N/A	340	2	N/A	45.767	0.6	0.049	2.2	0.146	2.1	0.022	0.6	0.31	157.0	52.0	52.4	139.3	0.9	0.9	138.1	2.6	2.6	101	139.3	0.9	0.9
SK19-07	2020	UCSB	Run 4	144	core	N/A	N/A	152	2	N/A	37.383	0.9	0.051	2.4	0.187	2.8	0.027	0.9	0.69	235.0	53.0	53.8	170.2	1.6	1.6	173.7	4.4	4.4	98	170.2	1.6	1.6
SK19-07	2020	UCSB	Run 4	145	core	N/A	N/A	228	2	N/A	50.050	1.3	0.050	2.0	0.138	2.3	0.020	1.3	0.04	193.0	47.0	47.6	127.5	1.6	1.6	130.8	2.8	2.8	97	127.5	1.6	1.6
SK19-07	2020	UCSB	Run 4	146	core	N/A	N/A	371	2	N/A	44.703	0.6	0.049	2.4	0.150	2.3	0.022	0.6	-0.01	144.0	56.0	56.3	142.7	0.9	0.9	142.3	3.0	3.0	100	142.7	0.9	0.9
SK19-07	2020	UCSB	Run 4	146	rim	N/A	N/A	2124	1	N/A	44.131	1.0	0.048	0.8	0.150	1.2	0.023	1.0	0.75	118.0	18.0	18.6	144.5	1.5	1.5	142.1	1.6	1.6	102	144.5	1.5	1.5
SK19-07	2020	UCSB	Run 4	147	core	N/A	N/A	135	2	N/A	38.491	0.8	0.050	4.0	0.176	3.7	0.026	0.8	-0.08	164.0	90.0	90.2	165.3	1.3	1.3	164.5	5.6	5.6	100	165.3	1.3	1.3
SK19-07	2020	UCSB	Run 4	148	core	N/A	N/A	186	3	N/A	45.249	1.6	0.049	2.2	0.150	3.1	0.022	1.6	0.54	163.0	60.0	60.4	140.9	2.3	2.3	141.5	4.0	4.0	100	140.9	2.3	2.3
SK19-07	2020	UCSB	Run 4	148	rim	N/A	N/A	217	3	N/A	44.563	1.1	0.049	2.2	0.152	2.1	0.022	1.1	0.32	149.0	53.0	53.3	143.1	1.5	1.5	143.6	2.8					

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ. [†]	Name [‡]	Zr # [§]	loc.	f206c	²⁰⁶ Pb CPS	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK19-15C	2020	UCSB	Run 1	15	rim	N/A	N/A	81	3	N/A	50.891	2.4	0.063	12.2	0.172	12.2	0.020	2.4	0.35	660.0	250.0	250.8	125.4	3.0	3.0	161.0	18.0	18.0	78	125.4	3.0	3.0
SK19-15C	2020	UCSB	Run 1	12	rim	N/A	N/A	173	2	N/A	39.494	2.4	0.056	2.7	0.196	2.7	0.025	2.4	0.48	441.0	61.0	62.4	161.2	3.9	3.9	181.5	4.5	4.5	89	161.2	3.9	3.9
SK19-15C	2020	UCSB	Run 1	11	rim	N/A	N/A	216	4	N/A	53.937	2.2	0.049	1.9	0.128	3.2	0.019	2.2	0.63	134.0	45.0	45.2	118.4	2.6	2.6	122.0	3.6	3.6	97	118.4	2.6	2.6
SK19-15C	2020	UCSB	Run 1	24	rim	N/A	N/A	368	2	N/A	38.941	2.6	0.049	1.3	0.172	2.2	0.026	2.6	0.93	132.0	31.0	31.3	163.4	4.2	4.2	161.0	3.2	3.2	101	163.4	4.2	4.2
SK19-15C	2020	UCSB	Run 1	19	rim	N/A	N/A	1143	3	N/A	69.979	2.0	0.049	1.2	0.097	1.5	0.014	2.0	0.82	143.0	29.0	29.3	91.4	1.8	1.8	94.3	1.4	1.4	97	91.4	1.8	1.8
SK19-15C	2020	UCSB	Run 1	19	rim	N/A	N/A	1139	2	N/A	69.493	2.4	0.049	1.4	0.096	2.6	0.014	2.4	0.87	127.0	34.0	34.2	92.1	2.2	2.2	93.4	2.3	2.3	99	92.1	2.2	2.2
SK19-15C	2020	UCSB	Run 1	18	rim	N/A	N/A	885	3	N/A	40.258	1.4	0.049	1.2	0.169	1.1	0.025	1.4	0.62	149.0	27.0	27.4	158.2	2.2	2.2	158.6	1.6	1.6	100	158.2	2.2	2.2
SK19-15C	2020	UCSB	Run 1	21	rim	N/A	N/A	95	3	N/A	40.366	2.5	0.074	7.0	0.253	6.7	0.025	2.5	0.26	1020.0	140.0	143.3	158.0	3.8	3.8	228.0	14.0	14.0	69	158.0	3.8	3.8
SK19-20	2020	UCSB	Run 3	1	rim	N/A	N/A	33	3	N/A	26.903	1.2	0.050	6.1	0.261	6.5	0.037	1.2	0.09	200.0	140.0	140.4	235.2	2.7	2.7	236.0	14.0	14.4	100	235.2	2.7	2.7
SK19-20	2020	UCSB	Run 3	1	core	N/A	N/A	17	3	N/A	25.974	2.9	0.055	5.1	0.290	3.3	0.039	2.9	-0.11	410.0	110.0	112.3	243.4	7.1	7.1	258.4	7.6	8.5	94	243.4	7.1	7.1
SK19-20	2020	UCSB	Run 3	2	core	N/A	N/A	285	1	N/A	52.411	1.3	0.049	1.8	0.128	2.1	0.019	1.3	0.46	142.0	43.0	43.7	121.8	1.6	1.6	122.5	2.4	3.0	99	121.8	1.6	1.6
SK19-20	2020	UCSB	Run 3	2	rim	N/A	N/A	259	1	N/A	50.633	1.0	0.048	2.3	0.130	2.8	0.020	1.0	0.56	97.0	59.0	59.2	126.1	1.2	1.2	124.3	3.2	3.7	101	126.1	1.2	1.2
SK19-20	2020	UCSB	Run 3	3	core	N/A	N/A	345	2	N/A	53.706	1.5	0.049	2.0	0.125	1.6	0.019	1.5	0.16	137.0	47.0	47.6	118.9	1.7	1.7	119.9	1.8	2.5	99	118.9	1.7	1.7
SK19-20	2020	UCSB	Run 3	3	rim	N/A	N/A	165	2	N/A	52.632	2.8	0.048	2.7	0.127	4.3	0.019	2.8	0.38	115.0	81.0	81.2	121.3	3.3	3.3	121.2	4.9	5.2	100	121.3	3.3	3.3
SK19-20	2020	UCSB	Run 3	4	core	N/A	N/A	158	1	N/A	44.484	1.0	0.050	2.2	0.153	2.2	0.022	1.0	-0.02	171.0	52.0	52.8	143.3	1.5	1.5	144.9	2.9	3.6	99	143.3	1.5	1.5
SK19-20	2020	UCSB	Run 3	4	rim	N/A	N/A	172	2	N/A	44.583	1.4	0.049	3.3	0.149	2.9	0.022	1.4	0.21	133.0	74.0	74.4	143.0	2.0	2.0	140.8	3.8	4.3	102	143.0	2.0	2.0
SK19-20	2020	UCSB	Run 3	5	core	N/A	N/A	132	3	N/A	50.277	4.0	0.049	2.2	0.132	4.5	0.020	4.0	0.48	166.0	53.0	53.8	127.0	5.0	5.0	126.1	5.3	5.6	101	127.0	5.0	5.0
SK19-20	2020	UCSB	Run 3	6	core	N/A	N/A	54	4	N/A	39.432	1.5	0.050	2.8	0.172	3.7	0.025	1.5	0.57	164.0	66.0	66.6	161.5	2.5	2.5	161.3	5.4	5.9	100	161.5	2.5	2.5
SK19-20	2020	UCSB	Run 3	6	rim	N/A	N/A	56	2	N/A	38.655	1.5	0.046	5.7	0.162	6.1	0.026	1.5	0.31	-20.0	120.0	-120.0	164.7	2.4	2.4	151.9	8.6	8.9	108	164.7	2.4	2.4
SK19-20	2020	UCSB	Run 3	7	core	N/A	N/A	92	2	N/A	53.191	2.0	0.048	5.6	0.124	6.3	0.019	2.0	0.34	100.0	130.0	130.1	120.1	2.4	2.4	118.9	7.0	7.2	101	120.1	2.4	2.4
SK19-20	2020	UCSB	Run 3	8	core	N/A	N/A	174	7	N/A	80.972	3.0	0.052	4.3	0.087	5.0	0.012	3.0	0.68	261.0	96.0	97.1	79.1	2.3	2.3	84.9	4.1	4.3	93	79.1	2.3	2.3
SK19-20	2020	UCSB	Run 3	8	rim	N/A	N/A	526	3	N/A	62.228	3.2	0.049	2.4	0.108	4.0	0.016	3.2	0.80	144.0	60.0	60.5	102.8	3.2	3.2	103.7	3.9	4.2	99	102.8	3.2	3.2
SK19-20	2020	UCSB	Run 3	9	core	N/A	N/A	429	2	N/A	41.545	1.3	0.049	1.9	0.160	1.5	0.024	1.3	0.54	159.0	44.0	44.9	153.4	2.0	2.0	150.5	2.1	3.1	102	153.4	2.0	2.0
SK19-20	2020	UCSB	Run 3	9	rim	N/A	N/A	357	2	N/A	41.051	1.2	0.051	1.9	0.169	1.8	0.024	1.2	0.27	249.0	47.0	49.0	155.2	1.8	1.8	158.6	2.6	3.5	98	155.2	1.8	1.8
SK19-20	2020	UCSB	Run 3	10	core	N/A	N/A	413	2	N/A	41.408	0.9	0.049	1.7	0.163	1.6	0.024	0.9	0.44	160.0	38.0	39.0	153.8	1.4	1.4	152.9	2.3	3.2	101	153.8	1.4	1.4
SK19-20	2020	UCSB	Run 3	10	rim	N/A	N/A	254	3	N/A	59.137	1.6	0.050	1.9	0.114	2.6	0.017	1.6	0.55	186.0	44.0	45.2	108.1	1.7	1.7	109.6	2.7	3.2	99	108.1	1.7	1.7
SK19-20	2020	UCSB	Run 3	11	core	N/A	N/A	128	1	N/A	46.664	1.3	0.050	4.2	0.146	4.4	0.021	1.3	0.30	182.0	94.0	94.5	136.7	1.8	1.8	137.9	5.7	6.1	99	136.7	1.8	1.8
SK19-20	2020	UCSB	Run 3	12	core	N/A	N/A	55	1	N/A	42.194	1.7	0.048	5.6	0.157	4.6	0.024	1.7	-0.38	100.0	130.0	130.1	151.0	2.5	2.5	147.7	6.3	6.7	102	151.0	2.5	2.5
SK19-20	2020	UCSB	Run 3	12	rim	N/A	N/A	76	2	N/A	42.230	1.8	0.050	4.8	0.161	5.4	0.024	1.8	0.48	170.0	110.0	110.4	150.9	2.7	2.7	151.6	7.6	7.9	100	150.9	2.7	2.7
SK19-20	2020	UCSB	Run 3	13	core	N/A	N/A	232	2	N/A	47.281	1.7	0.049	4.5	0.139	2.9	0.021	1.7	0.21	120.0	100.0	100.2	134.9	2.3	2.3	131.8	3.5	4.0	102	134.9	2.3	2.3
SK19-20	2020	UCSB	Run 3	14	core	N/A	N/A	442	2	N/A	49.310	1.2	0.049	1.7	0.137	2.2	0.020	1.2	0.65	148.0	39.0	39.8	129.4	1.5	1.5	130.4	2.7	3.3	99	129.4	1.5	1.5
SK19-20	2020	UCSB	Run 3	14	rim	N/A	N/A	53	2	N/A	30.193	2.0	0.053	6.0	0.239	5.4	0.033	2.0	0.30	320.0	130.0	131.2	210.1	4.2	4.2	217.0	11.0	11.5	97	210.1	4.2	4.2
SK19-20	2020	UCSB	Run 3	15	core	N/A	N/A	40	4	N/A	28.555	1.9	0.054	5.6	0.263	5.7	0.035	1.9	0.23	350.0	130.0	131.4	221.9	4.0	4.0	236.0	12.0	12.5	94	221.9	4.0	4.0
SK19-20	2020	UCSB	Run 3	16	core	N/A	N/A	643	2	N/A	43.309	0.8	0.050	2.0	0.158	2.3	0.023	0.8	0.56	173.0	50.0	50.9	147.2	1.1	1.1	149.1	3.3	4.0	99	147.2	1.1	

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ. ⁺	Name ⁵	Zr # ⁴	loc.	f206c	²⁰⁶ Pb CPS	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK19-20	2020	UCSB	Run 3	48	rim	N/A	N/A	119	4	N/A	51.387	2.2	0.050	3.4	0.133	3.8	0.019	2.2	0.42	180.0	79.0	79.6	124.2	2.7	2.7	126.7	4.5	4.5	98	124.2	2.7	2.7
SK19-20	2020	UCSB	Run 3	49	core	N/A	N/A	120	3	N/A	48.333	2.0	0.048	3.7	0.137	3.9	0.021	2.0	0.35	116.0	84.0	84.2	132.0	2.6	2.6	130.7	4.8	5.2	101	132.0	2.6	2.6
SK19-20	2020	UCSB	Run 3	50	core	N/A	N/A	154	2	N/A	39.984	2.0	0.050	1.8	0.172	2.8	0.025	2.0	0.51	187.0	43.0	44.2	159.2	3.2	3.2	160.7	4.1	4.8	99	159.2	3.2	3.2
SK19-20	2020	UCSB	Run 3	51	core	N/A	N/A	84	4	N/A	38.790	2.6	0.048	5.4	0.170	5.3	0.026	2.6	0.15	100.0	120.0	120.1	164.1	4.2	4.2	159.6	7.8	8.2	103	164.1	4.2	4.2
SK19-20	2020	UCSB	Run 3	52	core	N/A	N/A	54	3	N/A	42.212	1.9	0.049	4.5	0.159	5.5	0.024	1.9	0.57	150.0	100.0	100.3	150.9	2.8	2.8	149.8	7.6	7.9	101	150.9	2.8	2.8
SK19-20	2020	UCSB	Run 3	53	core	N/A	N/A	524	1	N/A	41.563	2.5	0.049	2.0	0.162	3.2	0.024	2.5	0.64	164.0	47.0	47.9	153.2	3.8	3.8	152.5	4.6	5.1	100	153.2	3.8	3.8
SK19-20	2020	UCSB	Run 3	54	core	N/A	N/A	108	4	N/A	54.795	2.5	0.049	2.4	0.127	3.4	0.018	2.5	0.48	161.0	55.0	55.7	116.6	2.9	2.9	121.4	3.9	4.3	96	116.6	2.9	2.9
SK19-20	2020	UCSB	Run 3	55	rim	N/A	N/A	211	5	N/A	46.664	1.4	0.050	2.4	0.147	3.1	0.021	1.4	0.39	166.0	55.0	55.8	136.7	1.9	1.9	139.3	4.0	4.5	98	136.7	1.9	1.9
SK19-20	2020	UCSB	Run 3	55	core	N/A	N/A	99	2	N/A	43.159	2.5	0.050	4.4	0.158	4.4	0.023	2.5	0.09	170.0	100.0	100.4	147.7	3.6	3.6	149.0	6.1	6.5	99	147.7	3.6	3.6
SK19-20	2020	UCSB	Run 3	56	core	N/A	N/A	84	2	N/A	43.234	1.7	0.048	4.8	0.154	5.5	0.023	1.7	0.54	110.0	110.0	110.2	147.4	2.5	2.5	145.1	7.4	7.7	102	147.4	2.5	2.5
SK19-20	2020	UCSB	Run 3	57	core	N/A	N/A	329	2	N/A	47.148	2.4	0.049	1.0	0.144	2.6	0.021	2.4	0.89	143.0	23.0	24.3	135.3	3.2	3.2	136.1	3.3	3.9	99	135.3	3.2	3.2
SK19-20	2020	UCSB	Run 3	58	core	N/A	N/A	32	3	N/A	53.619	2.1	0.052	5.4	0.135	4.7	0.019	2.1	0.17	270.0	130.0	130.8	119.1	2.5	2.5	128.7	5.7	6.0	93	119.1	2.5	2.5
SK19-20	2020	UCSB	Run 3	59	rim	N/A	N/A	485	3	N/A	66.269	1.4	0.050	2.2	0.103	2.0	0.015	1.4	0.18	188.0	50.0	51.1	96.5	1.3	1.3	99.5	1.9	2.4	97	96.5	1.3	1.3
SK19-20	2020	UCSB	Run 3	59	core	N/A	N/A	607	2	N/A	41.597	1.2	0.049	1.5	0.163	1.6	0.024	1.2	0.68	149.0	35.0	35.9	153.1	1.9	1.9	153.3	2.2	3.2	100	153.1	1.9	1.9
SK19-20	2020	UCSB	Run 3	60	core	N/A	N/A	141	2	N/A	50.050	2.4	0.050	3.2	0.138	4.4	0.020	2.4	0.69	182.0	73.0	73.7	127.5	3.0	3.0	130.9	5.3	5.7	97	127.5	3.0	3.0
SK19-20	2020	UCSB	Run 3	61	core	N/A	N/A	60	4	N/A	26.954	1.2	0.053	3.4	0.271	2.4	0.037	1.2	0.06	300.0	80.0	81.7	234.8	2.8	2.8	243.1	5.2	6.4	97	234.8	2.8	2.8
SK19-20	2020	UCSB	Run 3	62	core	N/A	N/A	28	4	N/A	51.813	2.3	0.045	4.9	0.119	4.9	0.019	2.3	0.46	-50.0	100.0	-100.0	123.2	2.8	2.8	114.3	5.3	5.6	108	123.2	2.8	2.8
SK19-20	2020	UCSB	Run 3	63	core	N/A	N/A	176	2	N/A	40.883	1.6	0.049	2.7	0.165	2.4	0.024	1.6	0.34	128.0	62.0	62.4	155.8	2.5	2.5	154.9	3.5	4.2	101	155.8	2.5	2.5
SK19-20	2020	UCSB	Run 3	63	rim	N/A	N/A	176	3	N/A	41.102	1.7	0.049	2.6	0.163	2.4	0.024	1.7	0.17	162.0	60.0	60.7	154.9	2.6	2.6	153.6	3.4	4.1	101	154.9	2.6	2.6
SK19-20	2020	UCSB	Run 3	64	core	N/A	N/A	35	3	N/A	27.886	2.0	0.053	4.1	0.261	4.2	0.036	2.0	0.00	328.0	94.0	95.7	227.1	4.4	4.4	235.3	8.9	9.6	97	227.1	4.4	4.4
SK19-20	2020	UCSB	Run 3	65	core	N/A	N/A	132	2	N/A	43.103	0.9	0.049	3.3	0.156	2.7	0.023	0.9	-0.18	135.0	75.0	75.4	147.9	1.4	1.4	147.5	3.7	4.3	100	147.9	1.4	1.4
SK19-20	2020	UCSB	Run 3	66	core	N/A	N/A	252	3	N/A	50.607	3.5	0.050	2.4	0.137	4.4	0.020	3.5	0.85	190.0	56.0	57.0	126.1	4.4	4.4	130.0	5.4	5.7	97	126.1	4.4	4.4
SK19-20	2020	UCSB	Run 3	66	rim	N/A	N/A	521	4	N/A	115.741	2.8	0.047	2.3	0.057	3.4	0.009	2.8	0.69	62.0	59.0	59.1	55.5	1.6	1.6	55.9	1.8	2.0	99	55.5	1.6	1.6
SK19-20	2020	UCSB	Run 3	67	core	N/A	N/A	72	3	N/A	30.979	1.5	0.052	3.5	0.231	3.7	0.032	1.5	0.34	259.0	76.0	77.3	204.8	3.1	3.1	210.6	7.0	7.7	97	204.8	3.1	3.1
SK19-20	2020	UCSB	Run 3	68	core	N/A	N/A	42	2	N/A	27.778	2.1	0.054	2.4	0.269	2.6	0.036	2.1	0.27	369.0	67.0	70.0	228.0	4.7	4.7	242.0	5.5	6.6	94	228.0	4.7	4.7
SK19-20	2020	UCSB	Run 3	68	rim	N/A	N/A	975	4	N/A	47.506	1.7	0.050	1.3	0.147	1.4	0.021	1.7	0.65	204.0	31.0	33.0	134.3	2.3	2.3	139.0	1.8	2.8	97	134.3	2.3	2.3
SK19-20	2020	UCSB	Run 3	69	core	N/A	N/A	407	3	N/A	41.563	1.5	0.050	1.3	0.168	1.7	0.024	1.5	0.72	198.0	31.0	32.9	153.2	2.2	2.2	157.7	2.4	3.4	97	153.2	2.2	2.2
SK19-20	2020	UCSB	Run 3	70	core	N/A	N/A	268	2	N/A	41.632	2.0	0.050	1.3	0.162	3.3	0.024	2.0	0.86	179.0	30.0	31.6	153.0	3.1	3.1	152.7	4.7	5.2	100	153.0	3.1	3.1
SK19-20	2020	UCSB	Run 3	71	core	N/A	N/A	37	3	N/A	54.615	1.7	0.051	7.5	0.130	8.5	0.018	1.7	0.53	220.0	160.0	160.5	117.0	2.0	2.0	123.6	9.5	9.7	95	117.0	2.0	2.0
SK19-20	2020	UCSB	Run 3	71	rim	N/A	N/A	54	3	N/A	53.447	2.5	0.048	6.0	0.125	4.9	0.019	2.5	-0.19	100.0	130.0	130.1	119.5	2.9	2.9	119.1	5.5	5.8	100	119.5	2.9	2.9
SK19-20	2020	UCSB	Run 3	72	core	N/A	N/A	148	3	N/A	39.825	3.1	0.052	3.3	0.178	3.4	0.025	3.1	0.30	271.0	77.0	78.4	159.9	4.9	4.9	166.6	5.2	5.8	96	159.9	4.9	4.9
SK19-20	2020	UCSB	Run 3	72	rim	N/A	N/A	55	3	N/A	40.750	1.5	0.052	5.4	0.178	5.6	0.025	1.5	0.36	280.0	120.0	121.0	156.3	2.2	2.2	166.1	8.7	9.0	94	156.3	2.2	2.2
SK19-20	2020	UCSB	Run 3	73	core	N/A	N/A	165	4	N/A	43.917	2.2	0.051	2.2	0.160	3.0	0.023	2.2	0.74	217.0	51.0	52.4	145.2	3.1	3.1	150.7	4.2	4.8	96	145.2	3.1	3.1
SK19-20	2020	UCSB	Run 3	74	core	N/A	N/A	93	3	N/A	43.029	1.7	0.047	4.7	0.153	5.8	0.023	1.7	0.72	50.0	100.0	100.0	148.1	2.5	2.5	144.2	7.7	8.0	103	148.1	2.5	2.5
SK19-20	2020	UCSB	Run 3	75																												

SUPPLEMENTAL TABLE S3. DETRITAL ZIRCON ANALYSES

Sample	Year*	Univ. [†]	Name [‡]	Zr # [‡]	loc.	f206c	²⁰⁶ Pb CPs	U (ppm)	U/Th	²⁰⁶ Pb/ ²⁰⁴ Pb	Data for Tera-Wasserburg plot				Data for Wetherill plot				Dates										% conc	Accepted Ages		
											²³⁸ U/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (%)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (%)	²⁰⁶ Pb/ ²³⁸ U	Zs (%)	Rho	²⁰⁷ Pb/ ²⁰⁶ Pb	Zs (ABS)	Zs _{total} (ABS)	²⁰⁶ Pb/ ²³⁸ U	Zs (ABS)	Zs _{total} (ABS)	²⁰⁷ Pb/ ²³⁵ Pb	Zs (ABS)	Zs _{total} (ABS)		Date (Ma)	Zs (ABS)	Zs _{total} (ABS)
SK19-20clast	2020	UCSB	Run 5	35	rim	N/A	N/A	580	3	N/A	46.041	2.9	0.049	2.6	0.146	4.7	0.022	2.9	0.86	155.0	61.0	61.7	138.5	4.0	4.0	138.0	6.0	6.0	100	138.5	4.0	4.0
SK19-20clast	2020	UCSB	Run 5	36	core	N/A	N/A	483	7	N/A	41.051	3.1	0.052	2.1	0.171	4.1	0.024	3.1	0.80	263.0	50.0	52.4	155.2	4.8	4.8	160.4	6.1	6.1	97	155.2	4.8	4.8
SK19-20clast	2020	UCSB	Run 5	37	core	N/A	N/A	463	2	N/A	46.555	4.1	0.050	3.8	0.147	6.8	0.021	4.1	0.86	184.0	90.0	90.7	137.0	5.6	5.6	139.4	8.9	8.9	98	137.0	5.6	5.6
SK19-20clast	2020	UCSB	Run 5	38	core	N/A	N/A	244	2	N/A	47.438	2.3	0.049	3.1	0.141	4.1	0.021	2.3	0.60	127.0	69.0	69.4	134.5	3.1	3.1	133.8	5.1	5.1	101	134.5	3.1	3.1
SK19-20clast	2020	UCSB	Run 5	39	core	N/A	N/A	306	4	N/A	43.879	1.5	0.052	2.5	0.162	3.2	0.023	1.5	0.37	266.0	58.0	60.2	145.3	2.2	2.2	152.0	4.5	4.5	96	145.3	2.2	2.2
SK19-20clast	2020	UCSB	Run 5	40	core	N/A	N/A	61	2	N/A	43.309	3.1	0.048	8.3	0.154	9.1	0.023	3.1	0.47	90.0	180.0	180.1	147.1	4.5	4.5	145.0	12.0	12.0	101	147.1	4.5	4.5
SK19-20clast	2020	UCSB	Run 5	41	core	N/A	N/A	524	3	N/A	40.833	2.5	0.050	2.0	0.167	3.2	0.024	2.5	0.79	181.0	52.0	53.1	156.0	3.8	3.8	156.9	4.6	4.6	99	156.0	3.8	3.8
SK19-20clast	2020	UCSB	Run 5	42	core	N/A	N/A	402	2	N/A	43.745	4.2	0.049	3.4	0.155	5.9	0.023	4.2	0.85	164.0	82.0	82.6	145.7	6.1	6.1	146.2	8.1	8.1	100	145.7	6.1	6.1
SK19-20clast	2020	UCSB	Run 5	43	core	N/A	N/A	339	2	N/A	45.579	2.3	0.049	3.3	0.149	3.8	0.022	2.3	0.67	145.0	73.0	73.5	139.9	3.2	3.2	140.7	5.0	5.0	99	139.9	3.2	3.2
SK19-20clast	2020	UCSB	Run 5	44	core	N/A	N/A	124	3	N/A	42.301	2.2	0.048	2.9	0.154	3.2	0.024	2.2	0.58	74.0	69.0	69.1	150.6	3.4	3.4	145.3	4.4	4.4	104	150.6	3.4	3.4
SK19-20clast	2020	UCSB	Run 5	45	core	N/A	N/A	2640	2	N/A	40.145	3.5	0.050	0.5	0.168	3.0	0.025	3.5	0.98	178.0	12.0	16.1	158.6	5.6	5.6	157.5	4.5	4.5	101	158.6	5.6	5.6
SK19-20clast	2020	UCSB	Run 5	46	core	N/A	N/A	139	2	N/A	52.083	3.5	0.051	4.7	0.134	5.5	0.019	3.5	0.65	220.0	110.0	110.8	122.6	4.2	4.2	127.3	6.6	6.6	96	122.6	4.2	4.2
SK19-20clast	2020	UCSB	Run 5	47	core	N/A	N/A	323	3	N/A	40.816	4.5	0.051	3.8	0.171	6.4	0.025	4.5	0.84	214.0	85.0	86.0	156.0	6.9	6.9	159.7	9.9	9.9	98	156.0	6.9	6.9
SK19-20clast	2020	UCSB	Run 5	48	core	N/A	N/A	1670	1	N/A	42.808	3.2	0.050	1.1	0.160	2.4	0.023	3.2	0.92	211.0	25.0	28.0	148.9	4.7	4.7	151.0	3.3	3.3	99	148.9	4.7	4.7
SK19-20clast	2020	UCSB	Run 5	49	core	N/A	N/A	212	2	N/A	41.322	2.6	0.050	4.0	0.166	4.9	0.024	2.6	0.66	195.0	91.0	91.7	154.1	3.9	3.9	155.9	7.2	7.2	99	154.1	3.9	3.9
SK19-20clast	2020	UCSB	Run 5	50	core	N/A	N/A	282	3	N/A	56.980	2.4	0.053	3.8	0.127	4.0	0.018	2.4	0.42	303.0	89.0	90.8	112.2	2.7	2.7	121.4	4.6	4.6	92	112.2	2.7	2.7
SK19-20clast	2020	UCSB	Run 5	51	core	N/A	N/A	123	3	N/A	42.790	2.3	0.047	6.1	0.156	6.4	0.023	2.3	-0.12	60.0	130.0	130.0	148.9	3.3	3.3	146.7	9.1	9.1	101	148.9	3.3	3.3
SK19-20clast	2020	UCSB	Run 5	52	core	N/A	N/A	402	7	N/A	129.366	3.4	0.044	5.7	0.047	7.0	0.008	3.4	0.55	-110.0	110.0	-110.2	49.6	1.7	1.7	46.6	3.2	3.2	106	49.6	1.7	1.7
SK19-20clast	2020	UCSB	Run 5	53	core	N/A	N/A	170	2	N/A	44.111	3.2	0.051	3.3	0.160	5.4	0.023	3.2	0.80	266.0	67.0	68.9	144.5	4.6	4.6	150.9	7.6	7.6	96	144.5	4.6	4.6
SK19-20clast	2020	UCSB	Run 5	53	rim	N/A	N/A	179	3	N/A	51.653	2.5	0.063	5.3	0.168	5.4	0.019	2.5	0.36	680.0	120.0	126.7	123.6	3.1	3.1	157.9	8.0	8.0	78	123.6	3.1	3.1
SK19-20clast	2020	UCSB	Run 5	54	core	N/A	N/A	296	2	N/A	40.650	3.3	0.071	4.4	0.243	6.2	0.025	3.3	0.67	954.0	82.0	100.0	156.6	5.1	5.1	220.0	12.0	12.0	71	156.6	5.1	5.1
SK19-20clast	2020	UCSB	Run 5	55	core	N/A	N/A	173	4	N/A	44.425	3.1	0.051	4.0	0.159	5.8	0.023	3.1	0.75	240.0	100.0	101.0	143.5	4.4	4.4	150.0	8.1	8.1	96	143.5	4.4	4.4
SK19-20clast	2020	UCSB	Run 5	56	core	N/A	N/A	164	2	N/A	41.859	2.5	0.050	2.4	0.163	4.3	0.024	2.5	0.71	182.0	57.0	58.0	152.2	3.7	3.7	153.2	6.1	6.1	99	152.2	3.7	3.7
SK19-20clast	2020	UCSB	Run 5	57	core	N/A	N/A	227	3	N/A	52.329	2.6	0.050	2.6	0.134	3.6	0.019	2.6	0.66	169.0	63.0	63.8	122.0	3.1	3.1	127.4	4.3	4.3	96	122.0	3.1	3.1
SK19-20clast	2020	UCSB	Run 5	58	core	N/A	N/A	364	2	N/A	49.826	2.1	0.049	1.9	0.137	2.2	0.020	2.1	0.39	141.0	45.0	45.8	128.1	2.7	2.7	130.0	2.7	2.7	99	128.1	2.7	2.7
SK19-20clast	2020	UCSB	Run 5	59	core	N/A	N/A	291	1	N/A	42.373	4.2	0.048	4.0	0.159	5.1	0.024	4.2	0.68	101.0	89.0	89.2	150.2	6.4	6.4	149.4	7.1	7.1	101	150.2	6.4	6.4
SK19-20clast	2020	UCSB	Run 5	60	core	N/A	N/A	117	2	N/A	40.486	6.1	0.050	6.1	0.169	8.3	0.025	6.1	0.71	160.0	130.0	130.4	157.6	9.2	9.2	158.0	12.0	12.0	100	157.6	9.2	9.2
SK19-20clast	2020	UCSB	Run 5	61	core	N/A	N/A	168	4	N/A	45.496	4.5	0.051	3.6	0.155	4.6	0.022	4.5	0.59	221.0	83.0	84.1	140.2	6.3	6.3	146.6	6.3	6.3	96	140.2	6.3	6.3
SK19-20clast	2020	UCSB	Run 5	62	core	N/A	N/A	102	3	N/A	50.916	2.1	0.049	6.4	0.135	5.6	0.020	2.1	0.37	130.0	140.0	140.2	125.4	2.6	2.6	128.5	6.8	6.8	98	125.4	2.6	2.6
SK19-20clast	2020	UCSB	Run 5	63	core	N/A	N/A	49	6	N/A	47.870	3.0	0.047	7.2	0.139	8.6	0.021	3.0	0.53	60.0	150.0	150.0	133.3	3.9	3.9	132.0	11.0	11.0	101	133.3	3.9	3.9
SK19-20clast	2020	UCSB	Run 5	64	core	N/A	N/A	761	2	N/A	40.967	3.1	0.050	2.0	0.169	3.1	0.024	3.1	0.74	184.0	47.0	48.3	155.4	4.8	4.8	158.2	4.6	4.6	98	155.4	4.8	4.8
SK19-20clast	2020	UCSB	Run 5	65	core	N/A	N/A	567	2	N/A	43.611	2.3	0.049	2.0	0.156	3.3	0.023	2.3	0.85	140.0	47.0	47.7	146.2	3.3	3.3	147.0	4.6	4.6	99	146.2	3.3	3.3
SK19-20clast	2020	UCSB	Run 5	66	core	N/A	N/A	107	4	N/A	46.425	4.2	0.048	3.3	0.145	6.1	0.022	4.2	0.72	94.0	76.0	76.2	137.4	5.7	5.7	137.4	7.8	7.8	100	137.4	5.7	5.7
SK19-20clast	2020	UCSB	Run 5	67	core	N/A	N/A	293	4	N/A	40.984	3.2	0.051	3.3	0.175	5.7	0.024	3.2	0.76	231.0	76.0	77.3	155.4	4.9	4.9	163.4	8.7	8.7	95	155.4	4.9	4.9
SK19-20clast	2020	UCSB	Run 5	68	core	N/A	N/A	267	2	N/A	50.075	4.8	0.049	2.8	0.138	4.9	0.020	4.8	0.87	159.0	66.0	66.7	127.5	6.0	6.0	130.8	6.0	6.0	97	127.5	6.0	6.0
SK19-20clast	2020	UCSB	Run 5	69	core	N/A	N/A	80	3	N/A	41.684	2.8	0.050	4.4	0.16																	

SUPPLEMENTAL TABLE S4. WHOLE ROCK MAJOR- AND TRACE-ELEMENT COMPOSITIONS

	SK19-32*	SK19-55*	SK19-112*	SK19-159*	SK06-1C*	NC-775 [†]	SK19-123*
<u>Major Elements (Wt%)</u>							
SiO ₂	66.43	61.47	59.84	61.43	61.44	65.48	59.71
TiO ₂	0.69	0.83	0.90	0.78	0.95	0.73	0.84
Al ₂ O ₃	15.14	17.78	17.58	15.79	16.22	17.63	18.10
FeO	5.51	6.56	7.15	6.97	7.77	3.50	6.85
MnO	0.09	0.10	0.09	0.13	0.11	0.05	0.11
MgO	3.20	3.00	3.55	5.07	4.15	1.28	3.29
CaO	2.55	2.77	3.18	2.88	2.74	4.26	4.29
Na ₂ O	2.85	3.58	3.31	2.53	3.18	4.30	3.83
K ₂ O	2.50	2.75	3.07	3.18	2.06	1.16	1.75
P ₂ O ₅	0.19	0.21	0.27	0.17	0.23	0.25	0.25
Total	99.78	99.77	99.74	99.70	99.70	99.51	99.77
<u>Rare Earth Elements (ppm)</u>							
La	21.8	15.5	16.4	12.1	21.6	24.6	14.6
Ce	47.3	37.2	37.2	26.9	46.5	48.8	33.0
Pr	5.7	4.6	4.6	3.4	5.8	5.7	4.3
Nd	21.7	17.8	17.8	13.7	22.7	22.1	17.5
Sm	4.5	4.0	3.9	3.1	4.6	3.8	4.2
Eu	1.1	1.1	0.9	0.8	1.2	1.1	1.2
Gd	4.1	3.6	3.4	3.1	4.7	2.4	4.1
Tb	0.7	0.6	0.5	0.5	0.8	0.3	0.6
Dy	4.0	3.3	3.1	3.4	4.7	1.3	3.7
Ho	0.8	0.7	0.7	0.7	1.0	0.2	0.8
Er	2.3	2.0	1.9	2.0	2.9	0.6	2.1
Tm	0.4	0.3	0.3	0.3	0.4	0.1	0.3
Yb	2.3	2.1	1.9	2.0	3.0	0.4	2.1
Lu	0.3	0.3	0.3	0.3	0.4	0.1	0.3
<u>Other Trace Elements (ppm)</u>							
Be	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	1	N.M. [§]
Sc	17.2	21.5	21.4	20.4	21.8	5.0	20.1
V	154.7	191.0	205.4	173.0	219.0	45.0	190.3
Cr	98.8	89.3	117.6	199.0	204.0	< 20	65.4
Co	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	5	N.M. [§]
Ni	43.2	26.4	38.5	120.1	128.2	< 20	50.5
Cu	15.1	30.4	38.5	50.5	62.6	< 10	78.7
Zn	115.6	102.4	128.6	149.4	162.6	90.0	106.0
Ga	18.2	19.6	20.3	19.7	18.5	20.0	20.4
Ge	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	< 1	N.M. [§]
As	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	< 5	N.M. [§]
Rb	76.5	66.4	90.1	80.6	63.7	31.0	43.9
Sr	274.0	407.0	451.0	276.0	348.0	744.0	448.0
Y	21.7	17.7	16.3	18.1	26.0	5.0	20.0
Zr	120.6	119.0	127.9	94.9	174.8	147.0	95.8
Nb	9.6	6.2	6.9	4.8	10.0	4.0	5.7
Mo	3.2	1.0	1.8	1.9	2.0	< 2	1.4
Ag	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	0.6	N.M. [§]
In	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	< 0.2	N.M. [§]
Sn	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	< 1	N.M. [§]
Sb	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	< 0.5	N.M. [§]
Cs	5.4	3.7	3.9	3.2	1.7	1.2	2.2
Ba	734.0	634.0	808.0	1106.0	820.0	852.0	594.0
Hf	3.0	3.1	3.3	2.5	4.2	3.3	2.8
Ta	0.7	0.5	0.4	0.3	0.5	0.1	0.5
W	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	< 1	N.M. [§]
Tl	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	0.2	N.M. [§]
Pb	14.3	9.0	5.7	5.9	4.0	9.0	5.4
Bi	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	N.M. [§]	< 0.4	N.M. [§]
Th	5.9	3.8	4.2	2.5	5.1	2.8	2.9
U	3.0	1.8	1.6	1.6	1.3	0.8	1.5

*Analyzed at Activation Laboratories Ltd. in Ontario, Canada

[†]Analyzed at Pomona College, CA[§]N.M.: not measured

SUPPLEMENTAL TABLE S4 CONTINUED. WHOLE ROCK MAJOR- AND TRACE-ELEMENT COMPOSITIONS

	NC-792 [†]	NC-778 [†]	SK15-10B [†]	SK14-11A [†]	SK19-09B*	SK19-15C*	SK19-74C*
<u>Major Elements (Wt%)</u>							
SiO ₂	63.81	61.16	58.34	58.51	52.91	68.74	60.42
TiO ₂	0.69	0.92	0.86	0.84	2.26	0.88	1.09
Al ₂ O ₃	16.89	16.26	16.78	18.31	20.45	15.47	16.67
FeO	5.01	7.17	7.86	6.35	12.31	5.98	10.67
MnO	0.11	0.11	0.14	0.10	0.11	0.07	0.39
MgO	2.32	3.20	3.78	2.88	2.00	1.89	3.28
CaO	3.70	4.36	5.74	6.96	2.55	2.36	3.17
Na ₂ O	4.08	2.90	2.35	4.32	2.46	1.60	1.37
K ₂ O	1.53	1.82	1.80	0.66	2.80	1.60	1.31
P ₂ O ₅	0.18	0.15	0.16	0.22	0.43	0.51	0.23
Total	98.33	98.04	99.42	100.50	99.66	99.77	99.79
<u>Rare Earth Elements (ppm)</u>							
La	18.2	13.5	8.2	7.8	31.1	16.3	13.6
Ce	37.8	28.2	17.9	18.3	79.2	35.0	28.6
Pr	4.8	3.7	2.5	2.7	7.9	4.5	3.7
Nd	19.5	15.8	11.8	12.9	31.5	18.1	15.6
Sm	4.3	3.9	3.1	3.3	6.9	4.2	3.7
Eu	1.0	1.1	1.0	1.0	2.3	1.2	1.3
Gd	3.7	3.9	3.1	3.0	7.1	4.4	4.4
Tb	0.6	0.7	0.5	0.4	1.1	0.7	0.8
Dy	3.3	4.1	3.0	2.2	6.5	4.0	6.0
Ho	0.6	0.8	0.6	0.4	1.3	0.9	1.3
Er	1.6	2.3	1.9	1.0	3.7	2.4	3.9
Tm	0.2	0.3	0.3	0.2	0.5	0.3	0.6
Yb	1.5	2.1	1.8	1.0	3.5	2.3	3.6
Lu	0.2	0.3	0.3	0.1	0.5	0.3	0.6
<u>Other Trace Elements (ppm)</u>							
Be	N.M. [§]	N.M. [§]	< 1	< 1	N.M. [§]	N.M. [§]	N.M. [§]
Sc	14.1	23.9	24.0	13.0	43.4	18.9	37.7
V	125.2	187.8	192.0	143.0	323.0	164.3	218.9
Cr	46.5	107.9	70.0	30.0	141.2	124.2	105.7
Co	N.M. [§]	N.M. [§]	21	12	N.M. [§]	N.M. [§]	N.M. [§]
Ni	16.4	43.9	< 20	< 20	123.5	60.8	69.4
Cu	27.2	51.8	40.0	10.0	125.5	10.1	21.1
Zn	80.1	97.2	90.0	100.0	84.0	169.2	98.6
Ga	16.8	17.5	17.0	21.0	26.9	16.8	18.1
Ge	N.M. [§]	N.M. [§]	2	< 1	N.M. [§]	N.M. [§]	N.M. [§]
As	N.M. [§]	N.M. [§]	< 5	< 5	N.M. [§]	N.M. [§]	N.M. [§]
Rb	39.8	46.4	37.0	10.0	71.7	48.0	35.9
Sr	488.6	293.5	246.0	695.0	204.2	387.0	134.2
Y	16.8	20.9	14.0	9.0	34.1	23.4	39.4
Zr	99.7	121.6	62.0	63.0	246.3	112.1	109.1
Nb	5.2	6.8	3.0	2.0	37.3	6.3	15.8
Mo	N.M. [§]	N.M. [§]	< 2	< 2	0.9	0.3	0.4
Ag	N.M. [§]	N.M. [§]	< 0.5	< 0.5	N.M. [§]	N.M. [§]	N.M. [§]
In	N.M. [§]	N.M. [§]	< 0.2	< 0.2	N.M. [§]	N.M. [§]	N.M. [§]
Sn	N.M. [§]	N.M. [§]	1.0	1.0	N.M. [§]	N.M. [§]	N.M. [§]
Sb	N.M. [§]	N.M. [§]	4.9	< 0.5	N.M. [§]	N.M. [§]	N.M. [§]
Cs	2.4	1.8	3.8	< 0.5	4.8	2.5	2.0
Ba	563.0	462.6	121.0	414.0	1528.0	697.0	686.0
Hf	2.8	3.4	1.8	1.9	6.0	2.8	2.8
Ta	0.4	0.5	0.1	< 0.1	2.6	0.4	0.7
W	N.M. [§]	N.M. [§]	< 1	< 1	N.M. [§]	N.M. [§]	N.M. [§]
Tl	N.M. [§]	N.M. [§]	0.2	< 0.1	N.M. [§]	N.M. [§]	N.M. [§]
Pb	4.1	9.8	11.0	< 5	3.8	7.0	7.9
Bi	N.M. [§]	N.M. [§]	< 0.4	< 0.4	N.M. [§]	N.M. [§]	N.M. [§]
Th	3.8	2.8	1.3	0.8	6.1	2.8	2.9
U	1.0	1.5	0.6	0.4	2.5	1.8	1.3

*Analyzed at Activation Laboratories Ltd. in Ontario, Canada

[†]Analyzed at Pomona College, CA[§]N.M.: not measured

Supplemental Table S5. Mineral-specific accelerating voltage, beam current, beam diameter, and correction method for the EPMA analyses.

Location/Mineral Analyzed	Accelerating Voltage (kV)	Beam Current (nA)	Beam Diameter (micron)	Background Correction
<u>UC Davis</u>				
Garnet	15	20	<1	ZAF*
Biotite	15	10	10	ZAF*
Plagioclase	15	10	10	ZAF*
Amphibole	15	20	<1	ZAF*
<u>UMN</u>				
Garnet	15	20	1	MAN [†]
Biotite	15	10	5	MAN [†]
Plagioclase	15	20	5	MAN [†]
Amphibole	15	20	5	MAN [†]
Staurolite	15	20	2	MAN [†]
Cordierite	15	20	2	MAN [†]
Rutile	20	250	2	CITZAF [§]
*X-Phi version of ZAF correction (e.g. Armstrong, 1984)				
[†] Mean Atomic Number Background Correction (MAN; Donovan & Tingle, 1996; Donovan et al., 2016)				
[§] The matrix correction method was Phi-Rho-Z matrix correction using the Armstrong/Love Scott algorithm (CITZAF; Armstrong, 1984)				

SUPPLEMENTAL TABLE S6. REPRESENTATIVE EPMA ANALYSES FOR GARNET.

	SK19-32**		SK19-55**		SK19-112**		SK19-159**		SK19-142**		NC-775*		SK19-123**		SK19-146**		SK14-13**	
	core	rim	core	rim	core	rim	core	rim	core	rim	core	rim	core	rim	core	rim	core	rim
SiO ₂	37.92	37.44	37.61	36.49	37.24	37.27	38.00	37.52	37.59	36.71	38.26	38.07	37.89	36.75	37.41	38.15	37.72	37.37
TiO ₂	0.01	0.45	0.01	0.01	0.00	0.00	0.01	0.00	0.01	0.01	0.04	0.04	0.03	0.01	0.06	0.02	0.02	0.00
Al ₂ O ₃	21.87	21.27	21.60	20.91	21.60	21.48	21.91	21.68	21.89	21.36	21.31	21.19	21.96	21.37	21.34	21.89	21.80	21.55
Cr ₂ O ₃	0.05	0.01	0.05	0.04	0.05	0.01	0.00	0.01	0.03	0.00	0.01	0.01	0.00	0.06	0.00	0.02	0.01	0.01
FeO	30.02	30.64	31.91	32.03	30.55	30.50	26.27	29.14	30.16	33.50	29.10	30.52	25.95	31.98	27.12	27.48	28.97	29.97
MnO	1.29	4.29	0.92	4.26	1.31	2.11	1.27	5.36	1.44	3.16	2.30	3.31	0.97	3.30	3.17	0.72	0.99	1.07
MgO	5.99	3.62	5.47	3.17	4.89	4.47	6.79	4.23	5.89	3.46	3.86	3.33	5.96	3.47	2.66	6.29	5.98	5.62
CaO	3.10	2.97	2.46	2.29	4.09	3.88	5.25	2.36	3.05	1.35	5.78	4.38	7.00	2.50	8.50	5.61	4.22	3.76
Total	100.24	100.69	100.02	99.21	99.73	99.71	99.52	100.31	100.07	99.55	100.64	100.83	99.76	99.45	100.26	100.18	99.72	99.34
Cations per 12 oxygens																		
Si	2.97	2.97	2.97	2.97	2.96	2.97	2.97	2.98	2.96	2.97	3.01	3.01	2.96	2.96	2.97	2.97	2.97	2.97
Ti	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Al	2.02	1.99	2.01	2.00	2.02	2.02	2.02	2.03	2.03	2.03	1.98	1.98	2.02	2.03	2.00	2.01	2.02	2.02
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe	1.97	2.04	2.11	2.18	2.03	2.03	1.72	1.93	1.99	2.26	1.92	2.02	1.70	2.16	1.80	1.79	1.91	1.99
Mn	0.09	0.29	0.06	0.29	0.09	0.14	0.08	0.36	0.10	0.22	0.15	0.22	0.06	0.23	0.21	0.05	0.07	0.07
Mg	0.70	0.43	0.64	0.38	0.58	0.53	0.79	0.50	0.69	0.42	0.45	0.39	0.69	0.42	0.31	0.73	0.70	0.66
Ca	0.26	0.25	0.21	0.20	0.35	0.33	0.44	0.20	0.26	0.12	0.49	0.37	0.59	0.22	0.72	0.47	0.36	0.32
Fe	0.65	0.68	0.70	0.71	0.67	0.67	0.57	0.65	0.66	0.75	0.64	0.67	0.56	0.72	0.59	0.59	0.63	0.65
Mn	0.03	0.10	0.02	0.10	0.03	0.05	0.03	0.12	0.03	0.07	0.05	0.07	0.02	0.07	0.07	0.02	0.02	0.02
Mg	0.23	0.14	0.21	0.13	0.19	0.17	0.26	0.17	0.23	0.14	0.15	0.13	0.23	0.14	0.10	0.24	0.23	0.22
Ca	0.09	0.08	0.07	0.07	0.11	0.11	0.15	0.07	0.08	0.04	0.16	0.12	0.19	0.07	0.24	0.15	0.12	0.11
Mg#	0.26	0.17	0.23	0.15	0.22	0.21	0.32	0.21	0.26	0.16	0.19	0.16	0.29	0.16	0.15	0.29	0.27	0.25

*Analyzed at UC Davis

†Analyzed at UMN

SUPPLEMENTAL TABLE S6 CONTINUED. REPRESENTATIVE EPMA ANALYSES FOR GARNET.

	NC-792*		NC-778*		SK15-10B*		SK14-11A*		SK19-09A**		SK19-15C**		SK19-74B**		SK19-74C**	
	core	rim	core	rim	core	rim	core	rim	core	rim	core	rim	core	rim	core	rim
SiO ₂	38.02	37.17	38.25	38.19	38.58	38.25	38.61	37.70	36.76	36.95	36.43	36.87	37.13	36.83	37.01	37.21
TiO ₂	0.04	0.05	0.02	0.02	0.04	0.05	0.049	0.10	0.03	0.07	0.09	0.05	0.12	0.03	0.12	0.01
Al ₂ O ₃	21.43	21.21	21.36	21.20	21.43	21.30	21.35	21.12	21.11	21.14	21.02	21.34	21.26	21.40	20.96	21.45
Cr ₂ O ₃	0.01	0.03	0.05	0.04	0.00	0.02	0.00	0.01	0.00	0.02	0.01	0.03	0.06	0.01	0.01	0.02
FeO	30.02	30.15	31.87	32.48	28.14	27.59	27.66	27.40	38.09	34.10	33.21	34.17	25.76	32.52	24.95	32.69
MnO	1.54	4.32	2.45	2.59	1.65	2.00	2.582	2.76	2.38	0.24	1.25	0.28	6.07	1.84	7.02	0.54
MgO	3.98	3.41	5.32	4.70	4.53	3.51	4.91	4.69	1.46	1.30	1.52	1.93	1.26	3.68	1.12	3.58
CaO	5.86	3.64	1.53	1.53	6.15	7.54	6.10	6.54	1.19	6.62	6.09	5.62	8.46	3.46	8.26	4.43
Total	100.89	99.97	100.84	100.75	100.51	100.25	101.25	100.32	101.03	100.45	99.62	100.29	100.12	99.78	99.45	99.94
Cations per 12 oxygens																
Si	2.99	2.98	3.01	3.02	3.02	3.01	3.00	2.97	2.98	2.97	2.96	2.96	2.98	2.96	2.99	2.97
Ti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00
Al	1.99	2.00	1.98	1.97	1.98	1.98	1.96	1.96	2.01	2.00	2.01	2.02	2.01	2.02	2.00	2.02
Cr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fe	1.97	2.02	2.09	2.15	1.84	1.82	1.80	1.81	2.58	2.29	2.26	2.30	1.73	2.18	1.68	2.18
Mn	0.10	0.29	0.16	0.17	0.11	0.13	0.17	0.18	0.16	0.02	0.09	0.02	0.41	0.12	0.48	0.04
Mg	0.47	0.41	0.62	0.55	0.53	0.41	0.57	0.55	0.18	0.16	0.18	0.23	0.15	0.44	0.13	0.43
Ca	0.49	0.31	0.13	0.13	0.52	0.64	0.51	0.55	0.10	0.57	0.53	0.48	0.73	0.30	0.72	0.38
Fe	0.65	0.67	0.70	0.71	0.62	0.61	0.59	0.58	0.85	0.76	0.74	0.76	0.57	0.72	0.56	0.72
Mn	0.03	0.10	0.05	0.06	0.04	0.04	0.06	0.06	0.05	0.01	0.03	0.01	0.14	0.04	0.16	0.01
Mg	0.15	0.13	0.21	0.18	0.18	0.14	0.19	0.18	0.06	0.05	0.06	0.08	0.05	0.14	0.04	0.14
Ca	0.16	0.10	0.04	0.04	0.17	0.21	0.17	0.18	0.03	0.19	0.17	0.16	0.24	0.10	0.24	0.13
Mg#	0.19	0.17	0.23	0.21	0.22	0.18	0.24	0.23	0.06	0.06	0.08	0.09	0.08	0.17	0.07	0.16

*Analyzed at UC Davis

†Analyzed at UMN

SUPPLEMENTAL TABLE S7. REPRESENTATIVE EPMA ANALYSES FOR PLAGIOCLASE.

	SK19-32 [†]	SK19-55 [†]	SK19-112 [†]	SK19-159 [†]	SK19-142 [†]	NC-775*	SK19-123 [†]	SK19-146 [†]	SK14-13 [†]
SiO ₂	59.21	60.90	59.35	57.35	61.20	59.96	58.69	56.71	60.61
Al ₂ O ₃	25.90	25.34	25.93	27.17	24.57	25.31	26.19	27.76	25.23
FeO	0.02	0.10	0.05	0.02	0.01	0.05	0.06	0.06	0.02
CaO	6.48	5.82	6.50	7.81	5.07	6.22	7.18	8.55	5.92
Na ₂ O	7.94	8.19	8.08	7.18	8.76	7.89	7.72	6.83	8.29
K ₂ O	0.10	0.11	0.18	0.08	0.16	0.20	0.06	0.05	0.12
Total	99.65	100.46	100.08	99.62	99.77	99.62	99.90	99.95	100.18
Cations per 8 oxygens									
Si	2.65	2.69	2.65	2.58	2.72	2.68	2.62	2.54	2.69
Al	1.37	1.32	1.36	1.44	1.29	1.33	1.38	1.47	1.32
Fe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ca	0.31	0.28	0.31	0.38	0.24	0.30	0.34	0.41	0.28
Na	0.69	0.70	0.70	0.62	0.76	0.68	0.67	0.59	0.71
K	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.01
An	0.31	0.28	0.30	0.37	0.24	0.30	0.34	0.41	0.28
Ab	0.69	0.71	0.69	0.62	0.75	0.69	0.66	0.59	0.71
Or	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.01

*Analyzed at UC Davis

[†]Analyzed at UMN

SUPPLEMENTAL TABLE S7 CONTINUED. REPRESENTATIVE EPMA ANALYSES FOR PLAGIOCLASE.

	NC-792*	NC-778*	SK15-10B* [§]	SK15-10B* [#]	SK14-11A*	SK19-09A [†]	SK19-15C [†]	SK19-74B [†]	SK19-74C [†]
SiO ₂	59.85	58.59	53.16	58.42	59.73	57.70	61.01	56.02	55.98
Al ₂ O ₃	26.26	27.30	31.00	27.38	26.41	27.03	24.95	28.03	27.39
FeO	0.13	0.08	0.17	0.06	0.07	0.13	0.08	0.13	0.30
CaO	6.65	7.71	11.87	8.10	6.83	8.27	5.35	9.09	8.74
Na ₂ O	7.77	7.12	4.60	6.83	7.55	6.82	8.45	6.51	6.69
K ₂ O	0.10	0.08	0.03	0.09	0.07	0.07	0.17	0.06	0.09
Total	100.76	100.88	100.83	100.88	100.65	100.02	100.02	99.83	99.19
Cations per 8 oxygens									
Si	2.65	2.59	2.38	2.59	2.64	2.58	2.71	2.52	2.54
Al	1.37	1.42	1.64	1.43	1.38	1.43	1.31	1.49	1.46
Fe	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
Ca	0.31	0.37	0.57	0.38	0.32	0.40	0.25	0.44	0.42
Na	0.67	0.61	0.40	0.59	0.65	0.59	0.73	0.57	0.59
K	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.01
An	0.32	0.37	0.59	0.39	0.33	0.40	0.26	0.43	0.42
Ab	0.67	0.62	0.41	0.60	0.66	0.60	0.73	0.56	0.58
Or	0.01	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.01

*Analyzed at UC Davis

[†]Analyzed at UMN[§]plagioclase adjacent to garnet[#]matrix plagioclase

	SK19-32 [†]	SK19-55 [†]	SK19-112 [†]	SK19-159 [†]	SK19-142 [†]	NC-775*	SK19-123 [†]	SK19-146 [†]	SK14-13 [†]
SiO ₂	35.92	34.92	35.72	37.26	35.85	34.93	36.38	37.13	36.83
TiO ₂	2.87	2.58	3.53	2.14	2.05	3.58	2.46	1.69	2.08
Al ₂ O ₃	19.59	19.36	19.38	17.70	18.41	16.94	17.44	17.04	17.72
FeO	16.73	19.38	17.10	15.37	17.72	20.37	18.20	19.11	18.14
MnO	0.14	0.12	0.14	0.14	0.07	0.17	0.08	0.12	0.09
MgO	10.88	9.49	10.10	13.50	11.93	9.55	12.09	11.46	11.75
CaO	0.02	0.01	0.06	0.01	0.02	0.00	0.01	0.02	0.02
Na ₂ O	0.29	0.22	0.08	0.30	0.13	0.16	0.31	0.08	0.22
K ₂ O	9.46	9.41	9.84	8.86	9.10	9.46	8.87	9.65	9.22
Cr ₂ O ₃	0.11	0.05	0.09	0.13	0.08	—	0.09	0.03	0.05
Cl	0.02	0.01	0.04	0.03	0.03	0.03	0.06	0.03	0.07
Total	96.00	95.54	96.05	95.42	95.36	95.15	95.94	96.33	96.13
Cations per 22 oxygens									
Si	5.70	5.54	5.67	5.91	5.69	5.87	5.77	5.89	5.85
Ti	0.34	0.31	0.42	0.26	0.24	0.45	0.29	0.20	0.25
Al	3.66	3.62	3.63	3.31	3.44	3.35	3.26	3.19	1.66
Fe	2.22	2.57	2.27	2.04	2.35	2.86	2.42	2.54	2.41
Mn	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.02	0.01
Mg	2.57	2.24	2.39	3.19	2.82	2.39	2.86	2.71	2.78
Ca	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Na	0.09	0.07	0.02	0.09	0.04	0.05	0.10	0.02	0.03
K	2.91	2.89	3.03	2.73	2.80	3.08	2.73	2.97	0.93
Cr	0.01	0.01	0.01	0.02	0.01	—	0.01	0.00	0.00
Cl	0.01	0.00	0.01	0.01	0.01	0.01	0.02	0.01	0.02
Mg#	0.54	0.47	0.51	0.61	0.55	0.46	0.54	0.52	0.54

*Analyzed at UC Davis

[†]Analyzed at UMN

	NC-792*	NC-778*	SK15-10B*	SK14-11A*	SK19-09A [†]	SK19-15C [†]	SK19-74B [†]	SK19-74C [†]
SiO ₂	35.89	36.248	36.68	36.07	33.88	36.27	36.38	36.19
TiO ₂	2.84	2.405	2.69	2.98	2.03	2.35	2.24	2.26
Al ₂ O ₃	16.87	16.947	16.28	16.41	19.57	20.42	18.07	19.05
FeO	19.39	18.462	18.97	20.41	25.18	16.77	18.56	19.14
MnO	0.14	0.097	0.07	0.12	0.01	0.03	0.06	0.03
MgO	10.89	11.917	11.64	9.96	5.98	10.22	11.01	10.35
CaO	0.00	0	0.00	0.07	0.06	0.03	0.04	0.02
Na ₂ O	0.17	0.259	0.18	0.07	0.34	0.40	0.25	0.28
K ₂ O	9.20	9.038	9.01	9.09	8.65	9.11	8.18	8.20
Cr ₂ O ₃	—	—	—	—	0.03	0.15	0.17	0.17
Cl	0.05	0.00	0.03	0.08	0.02	0.02	0.01	0.00
Total	95.38	95.37	95.52	95.19	95.73	95.75	94.97	95.67
Cations per 22 oxygens								
Si	6.03	6.09	6.16	6.06	5.38	5.76	5.77	5.74
Ti	0.36	0.30	0.34	0.38	0.24	0.28	0.27	0.27
Al	3.34	3.36	3.22	3.25	3.66	3.82	3.38	3.56
Fe	2.72	2.59	2.67	2.87	3.34	2.23	2.46	2.54
Mn	0.02	0.01	0.01	0.02	0.00	0.00	0.01	0.00
Mg	2.73	2.98	2.92	2.49	1.41	2.42	2.61	2.45
Ca	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.00
Na	0.06	0.08	0.06	0.02	0.11	0.12	0.08	0.08
K	3.00	2.94	2.94	2.96	2.66	2.80	2.52	2.52
Cr	—	—	—	—	0.00	0.02	0.02	0.02
Cl	0.01	0.00	0.01	0.02	0.00	0.00	0.00	0.00
Mg#	0.50	0.54	0.52	0.47	0.30	0.52	0.51	0.49

*Analyzed at UC Davis

[†]Analyzed at UMN

SUPPLEMENTAL TABLE S9. REPRESENTATIVE EPMA ANALYSES FOR AMPHIBOLES.

	SK19-123 [†]	SK19-146 [†]	SK15-10B*	SK14-11A*
SiO ₂	51.79	51.53	44.40	44.47
TiO ₂	0.53	0.15	1.16	1.19
Al ₂ O ₃	1.95	2.13	12.24	11.07
Cr ₂ O ₃	0.02	0.01	0.02	0.01
FeO	25.99	25.80	17.08	18.47
MnO	0.66	0.78	0.32	0.34
MgO	15.85	15.76	9.67	9.54
CaO	0.47	0.52	11.26	10.91
Na ₂ O	0.14	0.16	0.92	1.25
K ₂ O	0.00	0.00	0.47	0.46
Cl	0.01	0.01	0.02	0.02
Total	97.41	96.84	97.53	97.70
Cations per 24 oxygens				
Si	7.69	7.68	6.56	6.60
Ti	0.06	0.02	0.13	0.13
Al	0.34	0.37	2.13	1.94
Cr	0.00	0.00	0.00	0.00
Fe	3.23	3.22	2.11	2.29
Mn	0.08	0.10	0.04	0.04
Mg	3.51	3.50	2.13	2.11
Ca	0.07	0.08	1.78	1.74
Na	0.04	0.05	0.26	0.36
K	0.00	0.00	0.09	0.09
Cl	0.00	0.00	0.01	0.00
Mg#	0.52	0.52	0.50	0.48
Amphibole Type	cummingtonite	cummingtonite	magnesio-hornblende	magnesio-hornblende
*Analyzed at UC Davis				
[†] Analyzed at UMN				

SUPPLEMENTAL TABLE S10. REPRESENTATIVE EPMA ANALYSES OF CORDIERITE.

	SK19-15C*	SK19-74B*	SK19-74C*
SiO ₂	47.83	48.83	47.83
TiO ₂	0.01	0.00	0.00
Al ₂ O ₃	32.35	32.51	33.44
Cr ₂ O ₃	0.00	0.00	0.02
FeO	9.39	6.56	8.70
MnO	0.09	0.10	0.07
MgO	7.27	7.11	8.17
CaO	0.01	3.19	0.06
Na ₂ O	0.41	0.67	0.23
K ₂ O	0.02	0.02	0.01
Total	97.37	99.00	98.52
Cations per 18 oxygens			
Si	4.91	5.02	4.91
Ti	0.00	0.00	0.00
Al	3.92	3.94	4.05
Cr	0.00	0.00	0.00
Fe	0.81	0.56	0.75
Mn	0.01	0.01	0.01
Mg	1.11	1.09	1.25
Ca	0.00	0.35	0.01
Na	0.08	0.13	0.05
K	0.00	0.00	0.00
Mg#	0.58	0.66	0.63
*Analyzed at UMN			

SUPPLEMENTAL TABLE S11. REPRESENTATIVE EPMA ANALYSES
OF STAUROLITE.

	SK19-112*	SK19-15C*
SiO ₂	26.57	27.64
TiO ₂	0.83	0.56
Al ₂ O ₃	55.21	53.39
Cr ₂ O ₃	0.13	0.12
FeO	11.77	11.68
MnO	0.08	0.10
MgO	2.50	1.42
CaO	0.00	0.01
Total	97.09	94.91
Cations per 24 oxygens		
Si	3.88	4.04
Ti	0.09	0.06
Al	9.51	9.19
Cr	0.01	0.01
Fe	1.44	1.43
Mn	0.01	0.01
Mg	0.54	0.31
Ca	0.00	0.00
Mg#	0.27	0.18
*Analyzed at UMN		

SUPPLEMENTAL TABLE S12. REPRESENTATIVE EPMA ANALYSES FOR RUTILE.

[illegible]

SUPPLEMENTAL TABLE S13. RAMAN PEAK POSITIONS AND WAVENUMBER SHIFTS FOR QUARTZ INCLUSIONS IN
GARNET.

Sample	Grt #	Incl. #	Wavenumbers (cm ⁻¹)						Inclusions Waveshift (cm ⁻¹)					
			464	s.e.	206	s.e.	127	s.e.	Δ464	s.e.	Δ206	s.e.	Δ127	s.e.
SK19-32: Aluminosilicate-Garnet-Biotite paragneiss from southern Ruby Mountain (Skagit Gneiss Group 1)														
SK19-32	1	1	463.12	0.02	201.03	0.06	126.32	0.02	-1.50	0.03	-5.55	0.17	-1.77	0.05
SK19-32	1	2	463.29	0.02	201.58	0.11	126.44	0.03	-1.32	0.02	-4.86	0.11	-1.60	0.04
SK19-32	1	3	463.41	0.02	202.53	0.10	126.64	0.05	-1.22	0.02	-3.92	0.11	-1.42	0.06
SK19-32	2	1	464.52	0.04	206.47	0.14	127.77	0.03	-0.13	0.04	0.09	0.15	-0.22	0.03
SK19-32	3	1	464.32	0.04	205.27	0.16	127.48	0.07	-0.39	0.04	-1.17	0.16	-0.58	0.07
SK19-32	4	1	463.46	0.03	202.49	0.08	126.56	0.02	-1.32	0.04	-4.07	0.09	-1.58	0.03
SK19-32	4	2	463.24	0.03	202.78	0.24	126.53	0.07	-1.43	0.03	-3.69	0.24	-1.56	0.07
SK19-32	5	1	463.58	0.04	203.48	0.13	127.03	0.05	-1.14	0.04	-3.03	0.14	-1.10	0.05
SK19-55: Sillimanite-Garnet-Biotite paragneiss from Red Mountain (Skagit Gneiss Group 1)														
SK19-55	1	1	463.97	0.03	205.32	0.27	127.00	0.03	-0.63	0.03	-1.12	0.31	-1.02	0.06
SK19-55	1	2	463.11	0.04	201.73	0.06	126.34	0.02	-1.52	0.07	-4.79	0.17	-1.72	0.05
SK19-55	1	3	463.52	0.02	201.97	0.09	126.45	0.02	-1.03	0.03	-4.45	0.19	-1.55	0.05
SK19-55	1	4	463.24	0.02	200.78	0.05	126.16	0.01	-1.51	0.03	-5.89	0.17	-2.02	0.05
SK19-55	2	1	463.38	0.05	200.94	0.12	126.45	0.04	-1.31	0.09	-5.58	0.21	-1.63	0.08
SK19-55	2	2	463.15	0.03	201.18	0.08	126.50	0.02	-1.46	0.03	-5.38	0.18	-1.62	0.05
SK19-55	3	1	463.42	0.02	202.13	0.05	126.60	0.03	-1.20	0.03	-4.40	0.17	-1.47	0.05
SK19-55	4	1	464.24	0.02	204.57	0.06	127.40	0.04	-0.52	0.03	-2.07	0.17	-0.84	0.06
SK19-55	5	1	462.99	0.02	201.43	0.13	125.70	0.04	-1.65	0.03	-5.30	0.21	-2.40	0.06
SK19-112: Garnet-Biotite paragneiss from near Colonial Glacier (Skagit Gneiss Group 1)														
SK19-112	1	1	463.20	0.02	201.00	0.08	126.22	0.02	-1.62	0.03	-5.57	0.12	-1.98	0.04
SK19-112	1	2	463.85	0.01	203.05	0.07	126.76	0.02	-0.88	0.03	-3.44	0.12	-1.40	0.03
SK19-112	1	3	463.12	0.03	202.45	0.17	126.40	0.04	-1.62	0.03	-4.03	0.19	-1.77	0.05
SK19-112	1	4	463.60	0.01	202.67	0.07	126.82	0.03	-1.18	0.02	-3.91	0.12	-1.43	0.04
SK19-112	1	5	463.40	0.02	202.35	0.16	126.58	0.11	-1.41	0.03	-4.05	0.19	-1.61	0.11
SK19-112	1	6	464.71	0.01	206.25	0.08	127.86	0.02	-0.11	0.02	-0.25	0.12	-0.35	0.02
SK19-112	1	7	463.34	0.05	201.51	0.12	126.56	0.04	-1.43	0.05	-4.95	0.15	-1.60	0.04
SK19-112	2	1	464.46	0.02	205.57	0.05	127.72	0.01	-0.35	0.03	-0.96	0.10	-0.52	0.02
SK19-112	2	2	463.12	0.02	200.49	0.08	125.97	0.03	-1.76	0.02	-6.11	0.12	-2.29	0.03
SK19-112	3	1	463.12	0.02	200.75	0.06	126.29	0.03	-1.62	0.03	-5.74	0.11	-1.90	0.03
SK19-112	3	2	462.55	0.02	198.85	0.10	125.50	0.03	-2.26	0.03	-7.67	0.14	-2.72	0.04
SK19-112	4	1	463.58	0.03	202.25	0.07	126.61	0.03	-1.17	0.03	-4.24	0.11	-1.60	0.03
SK19-112	4	2	462.98	0.01	200.09	0.08	126.19	0.04	-1.91	0.02	-6.52	0.12	-2.13	0.05
SK19-159: Garnet-biotite paragneiss from western Red Mountain (Skagit Gneiss Group 1)														
SK19-159	1	1	464.43	0.04	205.07	0.12	127.51	0.03	-0.39	0.04	-1.39	0.15	-0.66	0.03
SK19-159	2	1	463.18	0.03	201.47	0.08	126.59	0.02	-1.67	0.04	-5.17	0.12	-1.67	0.03
SK19-159	3	1	464.89	0.02	205.43	0.06	127.51	0.01	0.02	0.03	-1.19	0.11	-0.83	0.02
SK19-159	3	2	462.86	0.02	200.70	0.12	125.93	0.05	-2.00	0.03	-5.94	0.15	-2.27	0.05
SK19-159	3	3	463.02	0.02	199.94	0.06	126.02	0.01	-1.88	0.05	-6.73	0.11	-2.26	0.03
SK19-159	3	4	463.38	0.03	201.12	0.10	125.77	0.02	-1.49	0.04	-5.44	0.13	-2.38	0.03
SK06-1C: Skagit Garnet-Sillimanite-Biotite paragneiss from Gorge Lake (Skagit Gneiss Group 1)														
SK06-1C	1	1	462.44	0.01	198.01	0.06	125.51	0.02	-2.29	0.05	-8.72	0.09	-2.74	0.05
SK06-1C	1	2	462.69	0.01	198.77	0.06	125.71	0.02	-2.11	0.07	-7.94	0.12	-2.44	0.16
SK06-1C	1	3	462.69	0.01	198.92	0.06	125.73	0.02	-2.05	0.03	-7.79	0.09	-2.45	0.03
SK06-1C	1	4	462.84	0.02	199.98	0.10	125.84	0.02	-2.07	0.03	-6.81	0.12	-2.39	0.03
SK06-1C	2	1	464.62	0.02	205.86	0.05	127.72	0.01	-0.36	0.03	-1.13	0.08	-0.65	0.02
SK06-1C	3	1	463.30	0.02	201.45	0.06	126.44	0.02	-1.73	0.03	-5.48	0.08	-1.89	0.02
SK06-1C	4	1	462.42	0.02	198.40	0.08	125.96	0.03	-2.68	0.03	-8.60	0.10	-2.56	0.04
SK06-1C	5	1	462.64	0.02	198.72	0.06	126.15	0.03	-2.41	0.02	-8.24	0.09	-2.22	0.03
*N.D. = not determined														

*N.D. = not determined

SUPPLEMENTAL TABLE S13 CONTINUED. RAMAN PEAK POSITIONS AND WAVENUMBER SHIFTS FOR QUARTZ
INCLUSIONS IN GARNET.

Sample	Grt #	Incl. #	Wavenumbers (cm ⁻¹)						Inclusions Waveshift (cm ⁻¹)					
			464	s.e.	206	s.e.	127	s.e.	Δ464	s.e.	Δ206	s.e.	Δ127	s.e.
<u>SK19-142: Garnet-Biotite paragneiss from western Gorge Lake (Skagit Gneiss Group 1)</u>														
SK19-142	1	1	462.58	0.02	199.44	0.09	125.47	0.02	-2.13	0.02	-7.01	0.10	-2.62	0.03
SK19-142	1	2	462.04	0.02	198.48	0.08	125.66	0.02	-2.53	0.03	-7.94	0.09	-2.36	0.03
SK19-142	1	3	462.29	0.02	198.88	0.08	125.79	0.05	-2.34	0.02	-7.49	0.09	-2.17	0.08
SK19-142	1	4	462.40	0.02	199.00	0.08	125.78	0.04	-2.14	0.02	-7.35	0.10	-2.20	0.05
SK19-142	2	1	463.04	0.03	201.20	0.09	126.27	0.04	-1.54	0.03	-5.18	0.11	-1.72	0.04
SK19-142	3	1	462.95	0.02	200.64	0.08	126.07	0.02	-1.62	0.02	-5.76	0.09	-1.95	0.02
SK19-142	3	2	462.70	0.02	199.55	0.06	125.71	0.02	-1.85	0.02	-6.86	0.08	-2.30	0.03
SK19-142	3	3	462.57	0.03	199.90	0.13	125.71	0.04	-1.99	0.04	-6.48	0.13	-2.30	0.04
SK19-142	3	4	462.78	0.05	200.94	0.17	125.92	0.06	-1.76	0.05	-5.39	0.18	-2.04	0.06
SK19-142	3	5	462.52	0.02	199.13	0.10	125.78	0.02	-2.05	0.02	-7.26	0.11	-2.22	0.03
SK19-142	4	1	462.62	0.02	199.58	0.05	125.99	0.02	-1.95	0.02	-6.76	0.07	-1.98	0.03
SK19-142	4	2	462.62	0.03	199.30	0.07	125.71	0.03	-1.98	0.03	-7.12	0.08	-2.30	0.04
SK19-142	4	3	462.62	0.02	199.27	0.07	125.79	0.02	-2.07	0.03	-7.15	0.08	-2.33	0.03
SK19-142	5	1	462.67	0.03	200.18	0.07	125.74	0.03	-2.05	0.08	-6.20	0.09	-2.29	0.04
SK19-142	5	2	462.75	0.02	200.51	0.11	125.82	0.04	-2.01	0.02	-6.01	0.12	-2.32	0.15
SK19-142	5	3	462.80	0.02	201.24	0.13	125.91	0.05	-1.79	0.03	-5.16	0.14	-2.10	0.06
<u>SK06-91: Garnet-Biotite-Sillimanite-Cordierite paragneiss from Ruby Mountain (Skagit Gneiss Group 1)</u>														
SK06-91	1	1	463.14	0.02	201.75	0.08	126.32	0.04	-1.39	0.05	-4.65	0.10	-1.56	0.04
SK06-91	2	1	463.34	0.02	201.89	0.05	126.59	0.02	-1.42	0.04	-4.74	0.08	-1.48	0.03
SK06-91	3	1	463.64	0.03	202.94	0.08	126.85	0.03	-1.13	0.03	-3.66	0.10	-1.18	0.04
<u>SK19-123: Garnet-Cummingtonite-Biotite paragneiss from southern Diablo Lake (Skagit Gneiss Group 2)</u>														
SK19-123	1	1	462.55	0.05	200.38	0.30	125.38	0.08	-2.05	0.05	-6.12	0.31	-2.80	0.09
SK19-123	1	2	462.87	0.02	199.89	0.08	126.16	0.03	-1.95	0.02	-6.64	0.12	-2.02	0.04
SK19-123	1	3	463.05	0.03	199.80	0.11	126.11	0.03	-1.74	0.04	-6.68	0.14	-2.05	0.03
SK19-123	1	4	463.10	0.06	199.97	0.25	125.67	0.10	-1.74	0.06	-6.60	0.26	-2.55	0.10
SK19-123	1	5	463.49	0.02	201.10	0.09	126.54	0.03	-1.39	0.03	-5.46	0.12	-1.69	0.03
SK19-123	1	6	463.48	0.03	201.44	0.15	126.41	0.07	-1.38	0.04	-5.15	0.17	-1.83	0.07
SK19-123	2	1	463.14	0.02	200.17	0.06	126.33	0.02	-1.77	0.03	-6.42	0.11	-1.92	0.03
SK19-123	2	2	462.65	0.04	199.12	0.10	125.94	0.03	-2.23	0.05	-7.52	0.14	-2.33	0.04
SK19-123	2	3	462.43	0.05	199.07	0.10	125.92	0.05	-2.46	0.05	-7.54	0.14	-2.36	0.05
SK19-123	2	4	462.54	0.03	198.60	0.09	125.88	0.03	-2.32	0.04	-8.02	0.13	-2.39	0.03
SK19-123	2	5	464.64	0.03	205.67	0.14	127.49	0.06	-0.29	0.03	-1.01	0.16	-0.80	0.06
SK19-123	2	6	462.54	0.02	198.22	0.07	126.18	0.03	-2.40	0.03	-8.44	0.12	-2.16	0.04
SK19-123	3	1	463.03	0.03	200.30	0.08	126.29	0.02	-1.92	0.04	-6.37	0.12	-2.06	0.03
SK19-123	3	2	462.65	0.02	198.79	0.07	126.18	0.01	-2.28	0.04	-7.88	0.13	-2.13	0.03
SK19-123	3	3	463.43	0.03	200.19	0.08	126.10	0.04	-1.42	0.03	-6.31	0.13	-2.08	0.05
SK19-123	3	4	463.62	0.05	200.50	0.17	126.42	0.11	-1.25	0.05	-6.05	0.19	-1.82	0.11
SK19-123	4	1	463.65	0.03	203.15	0.12	126.90	0.04	-0.89	0.03	-3.14	0.13	-1.01	0.04
SK19-123	4	2	462.48	0.04	199.61	0.10	125.96	0.03	-2.10	0.04	-6.67	0.11	-1.99	0.03
SK19-123	4	3	463.27	0.07	201.71	0.25	126.48	0.05	-1.22	0.07	-4.47	0.25	-1.35	0.05
SK19-123	5	1	462.79	0.02	199.57	0.08	125.52	0.03	-1.88	0.03	-6.80	0.09	-2.48	0.03
SK19-123	5	2	463.02	0.04	200.28	0.15	125.90	0.03	-1.48	0.04	-5.94	0.16	-2.04	0.04
SK19-123	5	3	462.81	0.03	199.65	0.10	125.74	0.03	-1.77	0.05	-6.63	0.11	-2.20	0.03
<u>SK19-146: Garnet-Biotite-Cummingtonite paragneiss from Diablo Dam (Skagit Gneiss Group 2)</u>														
SK19-146	1	1	464.80	0.02	206.76	0.06	127.87	0.01	0.03	0.04	0.35	0.10	-0.23	0.04
SK19-146	1	2	464.12	0.02	204.92	0.09	127.51	0.02	-0.70	0.03	-1.59	0.12	-0.66	0.05
SK19-146	1	3	462.96	0.03	201.46	0.08	126.61	0.02	-1.65	0.07	-4.90	0.12	-1.42	0.04
SK19-146	1	4	462.90	0.03	200.74	0.09	126.25	0.03	-1.76	0.05	-5.64	0.12	-1.79	0.05

*N.D. = not determined

*N.D. = not determined

SUPPLEMENTAL TABLE S13 CONTINUED. RAMAN PEAK POSITIONS AND WAVENUMBER SHIFTS FOR QUARTZ
INCLUSIONS IN GARNET.

Wavenumbers									Inclusions Waveshift					
Sample	Grt #	Incl. #	(cm ⁻¹)						(cm ⁻¹)					
			464	s.e.	206	s.e.	127	s.e.	Δ464	s.e.	Δ206	s.e.	Δ127	s.e.
SK19-146 Continued: Garnet-Biotite-Cummingtonite paragneiss from Diablo Dam (Skagit Gneiss Group 2)														
SK19-146	1	5	462.85	0.04	200.85	0.11	126.17	0.02	-1.79	0.07	-5.51	0.14	-1.85	0.04
SK19-146	2	1	464.34	0.03	205.28	0.09	127.67	0.02	-0.39	0.04	-1.15	0.12	-0.41	0.04
SK19-146	2	2	464.67	0.03	206.38	0.07	127.78	0.03	-0.23	0.04	-0.13	0.11	-0.35	0.10
SK19-146	3	1	465.08	0.02	207.67	0.05	128.08	0.01	0.52	0.03	1.30	0.06	0.11	0.02
SK19-146	3	2	463.27	0.02	201.88	0.07	126.31	0.02	-1.27	0.03	-4.50	0.08	-1.61	0.02
SK19-146	3	3	464.77	0.03	206.89	0.11	127.90	0.03	0.24	0.04	0.56	0.11	-0.06	0.04
SK14-13: Garnet-Biotite Paragneiss from Diablo Dam (Skagit Gneiss Group 2)														
SK14-13	1	1	463.92	0.01	204.36	0.04	127.09	0.01	-0.59	0.04	-2.23	0.12	-0.92	0.04
SK14-13	2	1	462.87	0.02	201.24	0.07	126.15	0.02	-1.71	0.04	-5.38	0.13	-1.97	0.04
SK14-13	2	2	463.82	0.04	204.83	0.08	127.16	0.03	-0.81	0.05	-1.78	0.13	-0.92	0.04
SK14-13	2	3	462.87	0.03	200.68	0.07	125.83	0.02	-1.55	0.09	-5.85	0.17	-2.02	0.08
SK14-13	2	4	462.81	0.02	200.95	0.05	126.29	0.02	-1.69	0.09	-5.71	0.17	-1.75	0.61
SK14-13	5	1	462.87	0.03	200.89	0.07	126.48	0.02	-1.64	0.06	-5.52	0.09	-1.41	0.05
SK14-13	5	2	464.01	0.03	205.12	0.07	127.13	0.06	-0.49	0.04	-1.31	0.12	-0.78	0.08
SK14-13	6	1	463.91	0.02	205.22	0.13	127.14	0.04	-0.47	0.03	-1.06	0.14	-0.63	0.06
SK14-13	6	2	462.67	0.02	199.53	0.06	125.38	0.02	-1.71	0.11	-6.80	0.10	-2.45	0.05
SK14-13	6	3	463.56	0.02	204.17	0.06	127.05	0.03	-0.82	0.07	-2.14	0.08	-0.64	0.10
SK14-13	6	4	462.51	0.02	199.82	0.05	126.22	0.01	-1.90	0.04	-6.49	0.07	-1.58	0.04
SK14-13	6	5	462.92	0.02	201.84	0.08	126.12	0.02	-1.46	0.06	-4.53	0.18	-1.67	0.08
NC-792: Garnet-Sillimanite-Biotite paragneiss from Sourdough Mountain (Skagit Gneiss Group 2)														
NC-792	1	1	464.21	0.02	205.79	0.08	127.73	0.03	-0.24	0.07	-0.68	0.22	-0.19	0.07
NC-792	1	2	462.73	0.02	200.28	0.18	125.90	0.05	-1.80	0.07	-6.32	0.28	-2.05	0.08
NC-792	1	3	463.00	0.03	200.81	0.17	126.01	0.03	-1.54	0.12	-5.70	0.31	-1.99	0.07
NC-792	2	1	462.72	0.02	199.49	0.05	125.79	0.02	-1.68	0.05	-7.00	0.13	-2.10	0.04
NC-792	2	2	463.93	0.03	204.65	0.07	127.16	0.05	-0.51	0.05	-1.84	0.14	-0.74	0.07
NC-792	2	3	462.99	0.02	200.44	0.05	125.82	0.02	-1.39	0.04	-6.05	0.12	-1.99	0.04
NC-792	3	1	463.18	0.03	202.17	0.17	126.22	0.05	-1.37	0.04	-4.41	0.20	-1.80	0.06
NC-778: Garnet-Biotite paragneiss from Ross Lake Dam (Skagit Gneiss Group 2)														
NC-778	1	1	462.30	0.03	198.40	0.13	125.81	0.03	-2.75	0.06	-8.61	0.21	-2.62	0.03
NC-778	2	1	462.71	0.02	197.98	0.12	126.12	0.03	-2.48	0.11	-8.94	0.21	-2.37	0.04
NC-778	2	2	462.56	0.03	199.76	0.30	126.02	0.05	-2.53	0.05	-7.28	0.36	-2.53	0.05
NC-778	2	3	462.91	0.06	205.07	0.75	126.46	0.14	-2.20	0.07	-2.04	0.77	-2.01	0.14
NC-778	2	4	462.52	0.02	199.07	0.34	126.52	0.06	-2.49	0.06	-7.93	0.45	-1.99	0.07
NC-778	2	5	461.31	0.04	N.D.*	N.D.*	N.D.*	N.D.*	-3.72	0.07	N.D.*	N.D.*	N.D.*	N.D.*
NC-778	3	1	461.40	0.02	198.01	0.24	124.64	0.11	-3.14	0.04	-8.38	0.25	-3.31	0.11
NC-778	4	1	461.73	0.04	197.45	0.12	125.23	0.04	-2.79	0.05	-8.89	0.13	-2.66	0.04
SK15-10B: Garnet-Hornblende paragneiss from Colonial Glacier (Skagit Gneiss Group 2)														
SK15-10B	1	1	462.56	0.03	200.36	0.12	126.03	0.06	-1.83	0.06	-6.02	0.23	-1.73	0.09
SK15-10B	1	2	462.51	0.01	200.05	0.14	126.18	0.06	-1.78	0.10	-6.28	19.66	-1.63	0.09
SK15-10B	1	3	464.22	0.01	205.78	0.08	127.61	0.04	-0.23	0.23	-0.72	0.27	-0.16	0.08
SK15-10B	2	1	462.56	0.02	199.58	0.15	126.09	0.07	-1.96	0.18	-6.81	0.58	-1.78	0.10
SK15-10B	3	1	461.84	0.02	198.37	0.18	125.35	0.06	-2.58	0.08	-8.15	0.57	-2.53	0.09
SK15-10B	3	2	462.33	0.02	200.01	0.17	126.01	0.29	-2.12	0.10	-6.54	0.28	-1.92	0.30
SK15-10B	3	3	461.86	0.02	198.09	0.17	125.86	0.05	-2.56	0.13	-8.47	0.33	-2.07	0.09
SK19-09B: Staurolite-Sillimanite-Biotite paragneiss from Elijah Ridge (meta-Methow terrane)														
SK19-09A	1	1	466.01	0.02	209.76	0.05	128.58	0.04	1.24	0.04	3.21	0.11	0.35	0.05
SK19-09A	1	2	465.75	0.02	208.80	0.08	128.51	0.01	0.82	0.02	2.18	0.12	0.24	0.03

*N.D. = not determined

*N.D. = not determined

SUPPLEMENTAL TABLE S13 CONTINUED. RAMAN PEAK POSITIONS AND WAVENUMBER SHIFTS FOR QUARTZ
INCLUSIONS IN GARNET.

INCLUSIONS IN GARNET:														
Sample	Grt #	Incl. #	Wavenumbers (cm ⁻¹)						Inclusions Waveshift (cm ⁻¹)					
			464	s.e.	206	s.e.	127	s.e.	Δ464	s.e.	Δ206	s.e.	Δ127	s.e.
<u>SK19-09B Continued: Staurolite-Sillimanite-Biotite paragneiss from Elijah Ridge (meta-Methow Group 3)</u>														
SK19-09A	2	1	466.34	0.02	210.49	0.07	128.82	0.01	1.52	0.03	3.95	0.12	0.61	0.03
SK19-09A	3	1	462.86	0.04	200.98	0.26	126.08	0.08	-1.92	0.04	-5.53	0.28	-2.10	0.08
SK19-09A	4	1	466.95	0.05	212.34	0.12	129.24	0.01	2.17	0.05	5.86	0.15	1.08	0.02
<u>SK07226B.2: Garnet-Biotite-Andalusite paragneiss from Elijah Ridge (meta-Methow Group 3)</u>														
SK07226B.2	1	1	464.91	0.01	207.38	0.07	127.63	0.01	0.57	0.04	1.12	0.10	-0.14	0.05
SK07226B.2	1	2	465.19	0.02	208.82	0.10	127.75	0.03	0.71	0.03	2.40	0.12	-0.15	0.05
SK07226B.2	1	3	466.25	0.02	210.81	0.06	128.52	0.01	1.72	0.03	4.43	0.08	0.66	0.04
SK07226B.2	1	4	464.73	0.02	206.39	0.15	127.61	0.09	-0.01	0.03	-0.25	0.16	-0.45	0.09
SK07226B.2	1	5	464.77	0.03	209.55	0.24	127.75	0.06	0.01	0.04	2.87	0.25	-0.31	0.07
SK07226B.2	1	6	465.43	0.02	208.45	0.09	128.20	0.03	0.64	0.03	1.73	0.11	0.02	0.04
<u>SK19-15C: Cordierite-Staurolite-Kyanite-Garnet-Biotite paragneiss from Gabriel Creek (meta-Methow Group 3)</u>														
SK19-15C	1	1	466.20	0.02	211.27	0.08	128.95	0.02	1.32	0.13	4.70	0.12	0.72	0.03
SK19-15C	2	1	464.95	0.03	206.68	0.06	127.58	0.01	0.12	0.04	0.14	0.11	-0.66	0.03
SK19-15C	3	1	464.68	0.04	208.45	0.36	127.57	0.09	-0.02	0.04	1.91	0.36	-0.54	0.09
SK19-15C	4	1	466.97	0.01	213.14	0.07	129.47	0.06	2.22	0.08	6.60	0.08	1.29	0.06
SK19-15C	5	1	466.61	0.02	212.37	0.08	128.95	0.07	1.88	0.02	5.82	0.09	0.79	0.08
SK19-15C	5	2	466.24	0.03	212.10	0.12	128.88	0.03	1.50	0.03	5.54	0.13	0.73	0.03
SK19-15C	5	3	466.58	0.08	213.23	0.25	129.21	0.19	1.82	0.08	6.68	0.26	1.06	0.19
SK19-15C	6	1	466.62	0.05	212.67	0.18	128.97	0.06	1.90	0.05	6.14	0.19	0.81	0.06
SK19-15C	6	2	464.30	0.03	204.85	0.23	127.21	0.06	-0.42	0.03	-1.68	0.23	-0.94	0.06
<u>SK19-74B: Cordierite-Garnet-Biotite paragneiss from western Beebe Mountain (meta-Methow Group 3)</u>														
SK19-74B	1	1	462.56	0.03	199.70	0.11	126.22	0.03	-2.12	0.03	-6.88	0.19	-1.91	0.06
SK19-74B	2	1	464.65	0.03	205.94	0.08	127.75	0.02	-0.05	0.03	-0.69	0.18	-0.42	0.05
SK19-74B	3	1	463.62	0.05	201.73	0.14	126.41	0.13	-1.09	0.05	-4.89	0.22	-1.72	0.14
SK19-74B	3	2	463.97	0.03	204.02	0.09	127.15	0.03	-0.74	0.03	-2.58	0.18	-1.01	0.05
SK19-74B	4	1	464.38	0.03	205.38	0.07	127.60	0.04	-0.34	0.04	-1.27	0.18	-0.61	0.06
SK19-74B	4	2	464.74	0.03	206.64	0.09	127.77	0.02	0.07	0.04	0.05	0.18	-0.37	0.05
SK19-74B	4	3	464.67	0.02	206.27	0.05	127.87	0.01	-0.04	0.04	-0.38	0.17	-0.25	0.05
<u>SK19-74C: Cordierite-Garnet-Biotite paragneiss from western Beebe Mountain (meta-Methow Group 3)</u>														
SK19-74C	1	1	464.46	0.02	205.94	0.06	127.81	0.02	-0.23	0.02	-0.52	0.11	-0.34	0.03
SK19-74C	1	2	462.79	0.10	202.88	0.27	125.55	0.10	-1.90	0.10	-3.55	0.28	-2.54	0.12
SK19-74C	2	1	464.51	0.04	205.94	0.08	127.69	0.02	-0.18	0.04	-0.48	0.12	-0.41	0.02
SK19-74C	2	2	464.33	0.02	205.44	0.10	127.55	0.04	-0.40	0.03	-1.02	0.13	-0.58	0.04
SK19-74C	2	3	464.12	0.03	205.04	0.15	127.41	0.04	-0.59	0.03	-1.43	0.18	-0.65	0.04
<u>SK08-273: Garnet amphibolite from western Elijah Ridge (Napeequa)</u>														
SK08273	1	1	466.74	0.02	212.39	0.05	129.13	0.01	2.17	0.03	5.93	0.10	1.18	0.02
SK08273	1	2	465.91	0.02	209.52	0.06	128.28	0.01	1.38	0.04	3.05	0.10	0.33	0.02
SK08273	2	1	464.95	0.02	206.98	0.07	127.88	0.02	0.49	0.03	0.71	0.12	-0.02	0.03
SK08273	3	1	466.55	0.01	211.98	0.04	128.99	0.01	2.09	0.06	5.57	0.10	1.07	0.02
SK08273	3	2	465.88	0.04	211.10	0.10	128.91	0.07	1.40	0.04	4.73	0.13	1.06	0.07
SK08273	4	1	466.38	0.01	211.22	0.07	129.28	0.06	1.90	0.03	4.84	0.11	1.37	0.06
*N.D. = not determined														

SUPPLEMENTAL TABLE S14. COMPARISON OF METAMORPHIC TEMPERATURES ASSOCIATED WITH THE THREE METASEDIMENTARY GROUPS.

Sample	Location	DZ groups	THERMOCALC Temperature (°C)	Ti-in-Biotite (°C)	Garnet-Biotite (°C)	Zr-in-Rutile (°C)	Interpreted Temperature Range (°C)
SK19-32	southern Ruby Mountain	1	683 (144)	666 (14)	704 (47)	658 (14)	640-670
SK19-55	Red Mountain	1	793 (66)	658 (13)	683 (106)	659 (20)	640-680
SK19-112	near Colonial Glacier	1	679 (80)	684 (14)	701 (42)	694 (14)	680-710
SK19-159	western Red Mountain	1	664 (76)	654 (16)	677 (56)	675 (16)	660-690
SK06-1C	Gorge Lake	1	N.D.*	630 (25) [†]	>700 [†]	713 (20)	690-730
SK19-142	western Gorge Lake	1 [§]	846 (76)	658 (22)	674 (59)	713 (20)*	700-760
NC-775	western Gorge Lake	1 [#]	722 (138)	708 (10)	736 (12)	732 (32)	700-760
SK0691	Ruby Mountain	1 [§]	700-800**	665 (25)**	830 (25)**	N.D.*	700-800**
SK19-123	southern Diablo Lake	2	590 (36)	659 (23)	730 (88)	684 (16)	670-700
SK19-146	Diablo Dam	2 [§]	503 (217)	585 (52)	745 (100)	711 (10)*	700-720
SK14-13	Diablo Dam	2 [§]	764 (78)	619 (17)	731 (22)	711 (10)*	700-720
NC-792	Sourdough Mountain	2 [#]	787 (89)	679 (9)	681 (50)	680 (19)	660-700
NC-778	Ross Lake Dam	2 [#]	809 (87)	696 (36)	685 (18)	N.D.*	670-710
SK15-10B	Colonial Glacier	2 [#]	672 (88)	692 (19)	713 (49)	708 (10)	700-720
SK14-11A	East Gorge Lake	2 [#]	800 (154)	659 (47)	820 (47)	678 (19)	660-700
SK19-09B	Elijah Ridge	3	N.D.*	N.D.*	N.D.*	635 (10)	620-650
SK19-09A	Elijah Ridge Float	3	638 (152)	569 (40)	594 (62)	635 (10)*	620-650
SK07226B.2	Elijah Ridge	3	650-700 [§]	609 (25)**	569 (25)**	635 (10)*	620-650
SK19-15C	Gabriel Creek	3	617 (26)	635 (16)	552 (78)	589 (18)	570-610
SK19-74B	western Beebe Mountain	3	445 (60)	639 (31)	564 (66)	597 (45)	600-700
SK19-74C	western Beebe Mountain	3	673 (81)	634 (30)	604 (68)	715 (18)	600-700
SK08273	western Elijah Ridge	Napeequa [§]	570-670**	N.D.*	N.D.*	N.D.*	570-670**

Note: 'Interpreted temperature range' determined predominantly based on the Zr-in-rutile temperatures, while being mindful of the other thermometry temperatures (see methods).

*N.D. = not determined

[†]Data from Whitney, 1992a

[§]Data from samples in the table with the same location

[#]Data from Sauer et al., 2017b

**Data from Gordon et al., 2010b

SUPPLEMENTAL TABLE S15. COMPARISONS OF METAMORPHIC PRESSURES ASSOCIATED WITH THE THREE METASEDIMENTARY GROUPS.

Sample	Location	DZ groups	THERMOCALC Pressure (kbar)	$P_{trap}^{464\text{ hyrdo}}$ (kbar)	P_{trap}^{strain} (kbar)
SK19-32	southern Ruby Mountain	1	8.5 (2.4)	6.14-6.80 (0.62)	5.93-6.61 (1.02)
SK19-55	Red Mountain	1	N.D.*	6.00-6.90 (0.49)	5.48-6.43 (0.90)
SK19-112	near Colonial Glacier	1	N.D.*	6.77-7.50 (0.67)	6.41-7.17 (0.91)
SK19-159	western Red Mountain	1	N.D.*	6.36-7.07 (0.98)	5.93-6.66 (1.06)
SK06-1C	Gorge Lake	1	8-10 [†]	6.38-7.44 (0.74)	5.71-6.88 (1.04)
SK19-142	western Gorge Lake	1 [§]	N.D.*	6.57-8.23 (0.23)	6.04-7.81 (0.33)
NC-775	western Gorge Lake	1 [#]	N.D.*	N.D.*	N.D.*
SK0691	Ruby Mountain	1 [§]	8-10**	7.23-9.91 (0.17)	6.80-9.59 (0.24)
SK19-123	southern Diablo Lake	2	6.3 (1.5)	6.02-6.77 (0.60)	5.37-6.17 (0.72)
SK19-146	Diablo Dam	2 [§]	5.5 (2.1)	7.26-7.94 (0.98)	7.18-7.87 (1.25)
SK14-13	Diablo Dam	2 [§]	N.D.*	7.33-7.82 (0.59)	6.99-7.50 (0.97)
NC-792	Sourdough Mountain	2 [#]	N.D.*	6.44-7.63 (0.76)	5.91-6.90 (1.11)
NC-778	Ross Lake Dam	2 [#]	N.D.*	5.21-6.30 (0.18)	5.53-6.61 (1.17)
SK15-10B	Colonial Glacier	2 [#]	8.5 (1.4)	6.73-7.26 (0.80)	7.15-7.68 (2.13)
SK14-11A	East Gorge Lake	2 [#]	8.3 (2.2)	N.D.*	N.D.*
SK19-09B	Elijah Ridge	3	N.D.*	N.D.*	N.D.*
SK19-09A	Elijah Ridge Float	3	10.6 (3)	8.48-9.04 (2.18)	8.77-9.32 (2.39)
SK07226B.2	Elijah Ridge	3	8-10**	8.03-8.59 (0.95)	8.70-9.24 (1.10)
SK19-15C	Gabriel Creek	3	9.3 (0.9), 5.7 (1.4) ^{††}	8.08-8.75 (1.54)	9.34-9.99 (2.05)
SK19-74B	western Beebe Mountain	3	N.D.*	5.94-8.06 (1.02)	5.55-7.73 (1.40)
SK19-74C	western Beebe Mountain	3	4.6 (1.2) ^{††}	5.87-7.99 (0.94)	6.25-8.31 (0.41)
SK08273	western Elijah Ridge	Napeequa**	8-10**	8.52-10.19 (0.99)	8.82-10.48 (1.29)

*N.D. = not determined

[†]Data from Whitney, 1992a[§]Data from samples in the table with the same location[#]Data from Sauer et al., 2017b

**Data from Gordon et al., 2010b

^{††}Garnet-cordierite isothermal decompression pressure

Supplemental References Cited

- Armstrong, J.T., 1984, Quantitative analysis of silicate and oxide minerals: A reevaluation of ZAF corrections and proposal for new Bence-Albee coefficients: *Microbeam Analysis*, v. 19, p. 208–212.
- Donovan, J.J., Lowers, H.A., and Rusk, B.G., 2011, Improved electron probe microanalysis of trace elements in quartz: *The American Mineralogist*, v. 96, p. 274–282, <https://doi.org/10.2138/am.2011.3631>.
- Donovan, J.J., Kremser, D., Fournelle, J.H., and Goemann, K., 2012, *Probe for EPMA: Acquisition, Automation and Analysis*: Eugene, Oregon, USA, Probe Software, Inc., 430 p.