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Supplemental Material

TABLE A1. ZIRCON U-Pb DATA OF MESOZOIC STRATA IN THE EASTERN JIAMUSI MASSIF

TABLE A2. ZIRCON Hf ISOTOPIC DATA OF MESOZOIC STRATA IN THE EASTERN JIAMUSI MASSIF

ANALYTICAL METHODS

Zircon U-Pb dating

Zircon grains were separated from the samples by conventional heavy liquid and magnetic techniques, and purified by handpicking under a binocular microscope at the Langfang Yantuo Geological Survey, Langfang, Hebei Province, China. The handpicked grains were examined under an optical microscope using transmitted and reflected light.

Cathodoluminescence (CL) images were obtained to reveal their internal structures using a JEOL (Japan Electron Optics Laboratory) scanning electron microscope housed at the State Key Laboratory of Continental Dynamics, Northwest University, Xi'an, China. The CL images were used to select domains within the grains for analysis. An Agilent 7500a ICP-MS equipped with a 193 nm laser, housed at the State Key Laboratory of Geological Processes and Mineral Resources, China University of Geosciences, Wuhan, China, was used to measure the zircon U-Pb ages. Zircon 91500 was used as external standard for age calibration and the U.S. National Institute of Standards and Technology Standard Reference Material 610 silicate glass (NIST SRM 610) was used for instrument optimization. The spot diameter was 32 μm . Details of the instrument parameters and procedures are provided by Yuan et al. (2004). ICPMSDataCal 7.0 (Liu et al., 2010) and Isoplot 3.0 (Ludwig, 2003) were used for data analysis and plotting. Corrections for common Pb were performed using the method of Andersen (2002). The quoted errors on individual LA-ICP-MS ages are 1σ ; errors on pooled ages are quoted at the 95% (2σ) confidence level. The results of the dating are listed in TABLE A1.

Hf isotopic analyses

In situ zircon Hf isotopic compositions were analyzed using a Neptune Plus multi-collector MC-ICP-MS (Thermo Fisher Scientific, Germany) equipped with a 193 nm excimer ArF laser ablation system (Lambda Physik, Göttingen, Germany) at the State Key Laboratory of Geological Processes and Mineral Resources, China University of Geosciences, China. Laser ablation analyses used an energy density of 5.3 J cm^{-2} . Helium was used as the carrier gas within the ablation cell and was mixed with argon after the ablation cell. A simple Y-junction downstream from the sample was used to add small amounts of nitrogen (4 mL min^{-1}) to the

argon (Hu et al., 2008a; Hu et al., 2008b). Compared with the standard arrangement, the addition of nitrogen in combination with the use of recently designed X-skimmer and Jet sample cones in the Neptune Plus improved the signal intensities for Hf, Yb, and Lu by factors of 5.3, 4.0, and 2.4, respectively. All data were acquired in single-spot ablation mode with a 44 μm spot size. Each measurement consisted of 20 s of background acquisition followed by 50 s of ablation signal acquisition. For further details of the operating conditions of the laser ablation system and the MC–ICP–MS and analytical procedures, see Hu et al. (2012). The Hf isotopic data are presented in TABLE A2.

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TABLE A1. ZIRCON U-Pb DATA OF MESOZOIC STRATA IN THE EASTERN JIAMUSI MASSIF

Sample number	Th (ppm)	U (ppm)	Th/U	Isotopic ratios								Ages (Ma)					
				$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$		$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$			
				ratio	1 σ	ratio	1 σ	ratio	1 σ	age	1 σ	age	1 σ	age	1 σ	age	1 σ
15MS1-1 a tuffaceous feldspathic quartz sandstone																	
15MS1-1-01	872	1720	0.51	0.05138	0.00137	0.33115	0.00901	0.04651	0.00045	258	45	290	7	293	3		
15MS1-1-02	1602	2273	0.70	0.05273	0.00129	0.35523	0.00892	0.04862	0.00054	317	37	309	7	306	3		
15MS1-1-03	260	467	0.56	0.05400	0.00297	0.32502	0.01754	0.04392	0.00071	371	92	286	13	277	4		
15MS1-1-04	262	484	0.54	0.05200	0.00460	0.32676	0.02839	0.04557	0.00076	286	202	287	22	287	5		
15MS1-1-05	966	1852	0.52	0.05483	0.00282	0.34381	0.01775	0.04528	0.00065	405	90	300	13	285	4		
15MS1-1-06	434	769	0.56	0.05183	0.00116	0.33749	0.00771	0.04703	0.00048	278	34	295	6	296	3		
15MS1-1-07	974	817	1.19	0.05413	0.00148	0.33381	0.00909	0.04461	0.00047	376	42	292	7	281	3		
15MS1-1-08	1011	2000	0.51	0.05366	0.00280	0.34174	0.01732	0.04619	0.00057	357	121	298	13	291	4		
15MS1-1-09	574	1272	0.45	0.05605	0.00202	0.35496	0.01233	0.04613	0.00056	454	56	308	9	291	3		
15MS1-1-10	428	980	0.44	0.05571	0.00147	0.34526	0.00972	0.04456	0.00048	441	43	301	7	281	3		
15MS1-1-11	874	1791	0.49	0.05488	0.00372	0.35086	0.02306	0.04636	0.00077	408	156	305	17	292	5		
15MS1-1-12	411	706	0.58	0.05587	0.00128	0.35748	0.00840	0.04613	0.00043	447	36	310	6	291	3		
15MS1-1-13	1249	2069	0.60	0.05659	0.00165	0.33875	0.00981	0.04347	0.00073	476	35	296	7	274	5		
15MS1-1-14	778	826	0.94	0.05658	0.00141	0.38827	0.00992	0.04952	0.00048	475	39	333	7	312	3		
15MS1-1-15	1109	2103	0.53	0.05351	0.00236	0.41497	0.02660	0.05598	0.00204	350	81	352	19	351	12		
15MS1-1-16	1584	2648	0.60	0.05774	0.00241	0.37494	0.01531	0.04744	0.00072	520	63	323	11	299	4		
15MS1-1-17	341	548	0.62	0.05422	0.00202	0.31756	0.01176	0.04264	0.00053	380	61	280	9	269	3		
15MS1-1-18	630	1324	0.48	0.05322	0.00267	0.32062	0.01505	0.04451	0.00076	338	75	282	12	281	5		
15MS1-1-19	260	478	0.54	0.05287	0.00137	0.31836	0.00846	0.04366	0.00050	323	39	281	7	275	3		
15MS1-1-20	1055	1875	0.56	0.05740	0.00315	0.36101	0.01947	0.04634	0.00076	507	90	313	15	292	5		
15MS1-1-21	197	310	0.63	0.05319	0.00301	0.31505	0.01732	0.04320	0.00073	337	94	278	13	273	4		
15MS1-1-22	195	500	0.39	0.05252	0.00126	0.33296	0.00799	0.04586	0.00043	308	37	292	6	289	3		
15MS1-1-23	1024	1897	0.54	0.05388	0.00494	0.34214	0.03110	0.04606	0.00055	366	210	299	24	290	3		
15MS1-1-24	1216	2264	0.54	0.05358	0.00121	0.37016	0.00857	0.04988	0.00047	353	35	320	6	314	3		
15MS1-1-25	1509	2699	0.56	0.05286	0.00157	0.33678	0.01052	0.04599	0.00067	323	45	295	8	290	4		
15MS1-1-26	549	1343	0.41	0.05323	0.00202	0.33705	0.01220	0.04592	0.00052	339	88	295	9	289	3		
15MS1-1-27	668	1634	0.41	0.05438	0.00142	0.39237	0.01016	0.05204	0.00049	387	41	336	7	327	3		
15MS1-1-28	1530	2395	0.64	0.05341	0.00195	0.32541	0.01183	0.04401	0.00065	346	55	286	9	278	4		
15MS1-1-29	1462	1792	0.82	0.05100	0.00164	0.32264	0.01005	0.04595	0.00054	241	50	284	8	290	3		
15MS1-1-30	590	828	0.71	0.05313	0.00207	0.34054	0.01215	0.04711	0.00063	334	57	298	9	297	4		
15MS1-1-31	1326	2062	0.64	0.05589	0.00169	0.37512	0.01138	0.04851	0.00052	448	48	323	8	305	3		
15MS1-1-32	918	2190	0.42	0.05482	0.00956	0.35163	0.06102	0.04652	0.00080	405	363	306	46	293	5		
15MS1-1-33	603	1206	0.50	0.05298	0.00132	0.32693	0.00875	0.04471	0.00057	328	38	287	7	282	4		
15MS1-1-34	954	2011	0.47	0.05417	0.00224	0.36299	0.01530	0.04853	0.00068	378	69	314	11	306	4		
15MS1-1-35	363	549	0.66	0.05512	0.00163	0.35255	0.00983	0.04651	0.00049	417	43	307	7	293	3		
15MS1-1-36	1465	2364	0.62	0.05488	0.00137	0.35168	0.00892	0.04635	0.00045	407	39	306	7	292	3		
15MS1-1-37	1624	2385	0.68	0.05532	0.00248	0.32491	0.01410	0.04260	0.00049	425	103	286	11	269	3		
15MS1-1-38	1335	1618	0.83	0.05599	0.00170	0.38069	0.01125	0.04920	0.00056	452	45	328	8	310	3		
15MS1-1-39	1211	1733	0.70	0.05391	0.00144	0.35182	0.00951	0.04728	0.00050	367	42	306	7	298	3		
15MS1-1-40	990	1827	0.54	0.05232	0.00153	0.34245	0.00931	0.04772	0.00055	299	41	299	7	300	3		
15MS1-1-41	873	1677	0.52	0.05508	0.00341	0.34729	0.02047	0.04674	0.00086	415	99	303	15	294	5		

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				$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$		$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$			
				ratio	1 σ	ratio	1 σ	ratio	1 σ	age	1 σ	age	1 σ	age	1 σ	age	1 σ
15MS1-1-42	294	425	0.69	0.05442	0.00202	0.35255	0.01230	0.04731	0.00062	388	55	307	9	298	4		
15MS1-1-43	577	830	0.69	0.05456	0.00218	0.40962	0.01663	0.05508	0.00100	394	58	349	12	346	6		
15MS1-1-44	243	509	0.48	0.05266	0.00122	0.35507	0.00825	0.04884	0.00044	314	36	309	6	307	3		
15MS1-1-45	720	1766	0.41	0.05336	0.00145	0.33149	0.00867	0.04523	0.00065	344	34	291	7	285	4		
15MS1-1-46	1475	2226	0.66	0.05382	0.00116	0.35052	0.00779	0.04703	0.00040	364	35	305	6	296	2		
15MS1-1-47	975	1857	0.52	0.05414	0.00157	0.35428	0.01002	0.04740	0.00045	377	46	308	8	299	3		
15MS1-1-48	775	1679	0.46	0.05265	0.00153	0.32302	0.01007	0.04424	0.00058	314	47	284	8	279	4		
15MS1-1-49	974	1874	0.52	0.05355	0.00157	0.37466	0.01161	0.05040	0.00059	352	49	323	9	317	4		
15MS1-1-50	974	1874	0.52	0.05299	0.00124	0.34638	0.00807	0.04712	0.00040	328	37	302	6	297	2		
15MS1-1-51	1696	2410	0.70	0.05298	0.00106	0.34001	0.00675	0.04623	0.00046	328	27	297	5	291	3		
15MS1-1-52	1454	2102	0.69	0.05358	0.00126	0.35372	0.00847	0.04749	0.00049	354	35	308	6	299	3		
15MS1-1-53	810	1709	0.47	0.05524	0.00277	0.35932	0.01761	0.04717	0.00049	422	115	312	13	297	3		
15MS1-1-54	363	624	0.58	0.05762	0.00180	0.61926	0.01840	0.07821	0.00091	515	45	489	12	485	5		
15MS1-1-55	676	811	0.83	0.05219	0.00250	0.29444	0.01165	0.04170	0.00063	294	62	262	9	263	4		
15MS1-1-56	630	1130	0.56	0.05168	0.00174	0.30474	0.01009	0.04267	0.00048	271	55	270	8	269	3		
15MS1-1-57	248	385	0.64	0.05487	0.00388	0.30925	0.02075	0.04249	0.00095	407	110	274	16	268	6		
15MS1-1-58	243	477	0.51	0.05768	0.00179	0.64330	0.02008	0.08108	0.00095	518	48	504	12	503	6		
15MS1-1-59	1008	3043	0.33	0.05706	0.00093	0.65319	0.01228	0.08277	0.00091	494	23	510	8	513	5		
15MS1-1-60	281	995	0.28	0.05786	0.00125	0.69436	0.01597	0.08695	0.00094	525	32	535	10	537	6		
15MS1-1-61	347	533	0.65	0.05716	0.00181	0.66974	0.02186	0.08495	0.00102	498	51	521	13	526	6		
15MS1-1-62	377	689	0.55	0.05824	0.00160	0.65992	0.01825	0.08248	0.00102	539	39	515	11	511	6		
15MS1-1-63	434	875	0.50	0.05167	0.00177	0.30168	0.01021	0.04251	0.00057	271	53	268	8	268	4		
15MS1-1-64	154	313	0.49	0.05909	0.00199	0.68533	0.02244	0.08490	0.00110	570	49	530	14	525	7		
15MS1-1-65	439	951	0.46	0.05847	0.00141	0.65383	0.01588	0.08085	0.00075	547	37	511	10	501	4		
15MS1-1-66	213	363	0.59	0.05405	0.00306	0.31102	0.01540	0.04272	0.00076	373	79	275	12	270	5		
15MS1-1-67	207	966	0.21	0.06509	0.00147	1.08573	0.02393	0.12031	0.00129	777	28	746	12	732	7		
15MS1-1-68	84	189	0.45	0.05832	0.00268	0.61911	0.02700	0.07857	0.00138	542	65	489	17	488	8		
15MS1-1-69	910	2452	0.37	0.05460	0.00135	0.36734	0.00912	0.04851	0.00045	396	39	318	7	305	3		
15MS1-1-70	1223	2267	0.54	0.06023	0.00092	0.69164	0.01074	0.08287	0.00062	612	21	534	6	513	4		
15MS1-1-71	758	2191	0.35	0.05121	0.00125	0.31098	0.00763	0.04401	0.00043	250	39	275	6	278	3		
15MS1-1-72	1080	2001	0.54	0.05170	0.00118	0.30610	0.00706	0.04290	0.00041	272	35	271	5	271	3		
15MS1-1-73	608	1487	0.41	0.05735	0.00110	0.64892	0.01331	0.08190	0.00083	505	28	508	8	507	5		
15MS1-1-74	432	768	0.56	0.05475	0.00214	0.31813	0.01217	0.04271	0.00053	402	63	280	9	270	3		
15MS1-1-75	628	943	0.67	0.05478	0.00144	0.41470	0.01056	0.05528	0.00058	403	38	352	8	347	4		
15MS1-1-76	768	1291	0.60	0.06027	0.00114	0.67329	0.01324	0.08108	0.00078	613	26	523	8	503	5		
15MS1-1-77	146	586	0.25	0.06986	0.00131	1.50588	0.03059	0.15667	0.00187	924	23	933	12	938	10		
15MS1-1-78	599	1054	0.57	0.05642	0.00118	0.60471	0.01292	0.07783	0.00080	469	29	480	8	483	5		
15MS1-1-79	953	1609	0.59	0.05342	0.00145	0.31185	0.00865	0.04238	0.00047	347	42	276	7	268	3		
15MS1-1-80	367	1328	0.28	0.05631	0.00107	0.69259	0.01390	0.08897	0.00082	464	28	534	8	549	5		
15MS1-1-81	332	725	0.46	0.05084	0.00189	0.32340	0.01197	0.04615	0.00055	234	63	285	9	291	3		
15MS1-1-82	1213	1815	0.67	0.05820	0.00114	0.62951	0.01212	0.07832	0.00068	537	27	496	8	486	4		
15MS1-1-83	460	1334	0.34	0.05729	0.00123	0.67077	0.01522	0.08452	0.00090	503	31	521	9	523	5		
15MS1-1-84	391	946	0.41	0.05677	0.00121	0.63026	0.01374	0.08018	0.00081	482	30	496	9	497	5		

Sample number	Th (ppm)	U (ppm)	Th/U	Isotopic ratios								Ages (Ma)					
				$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$		$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$			
				ratio	1 σ	ratio	1 σ	ratio	1 σ	age	1 σ	age	1 σ	age	1 σ	age	1 σ
15MS1-1-85	454	728	0.62	0.05613	0.00153	0.58406	0.01510	0.07555	0.00078	458	39	467	10	470	5		
15MS1-1-86	2027	2052	0.99	0.05285	0.00256	0.30561	0.01495	0.04168	0.00049	322	90	271	12	263	3		
15MS1-1-87	553	1999	0.28	0.05868	0.00114	0.71801	0.01413	0.08806	0.00084	555	26	549	8	544	5		
15MS1-1-88	499	1554	0.32	0.06661	0.00125	1.47442	0.02615	0.15835	0.00145	826	22	920	11	948	8		
17HL4-1 a feldspathic quartz sandstone																	
17HL4-1-01	167	380	0.44	0.05011	0.00289	0.22114	0.01235	0.03186	0.00044	200	103	203	10	202	3		
17HL4-1-02	694	988	0.70	0.05009	0.00186	0.21925	0.00762	0.03162	0.00036	199	59	201	6	201	2		
17HL4-1-03	359	738	0.49	0.04883	0.00195	0.22978	0.00878	0.03407	0.00037	140	69	210	7	216	2		
17HL4-1-04	437	740	0.59	0.05043	0.00188	0.22622	0.00834	0.03233	0.00037	215	64	207	7	205	2		
17HL4-1-05	282	562	0.50	0.05424	0.00165	0.62260	0.01787	0.08284	0.00091	381	45	491	11	513	5		
17HL4-1-06	161	352	0.46	0.05478	0.00210	0.55983	0.02034	0.07405	0.00082	403	61	451	13	461	5		
17HL4-1-07	382	669	0.57	0.05114	0.00163	0.29190	0.00928	0.04122	0.00044	247	53	260	7	260	3		
17HL4-1-08	145	222	0.65	0.05766	0.00229	0.62428	0.02457	0.07864	0.00090	517	66	493	15	488	5		
17HL4-1-09	565	1071	0.53	0.04915	0.00165	0.23151	0.00741	0.03424	0.00035	155	56	211	6	217	2		
17HL4-1-10	236	417	0.57	0.05074	0.00244	0.22849	0.01042	0.03309	0.00049	229	78	209	9	210	3		
17HL4-1-11	507	1144	0.44	0.04820	0.00166	0.22470	0.00753	0.03379	0.00030	109	62	206	6	214	2		
17HL4-1-12	153	305	0.50	0.05486	0.00322	0.25301	0.01422	0.03412	0.00049	406	100	229	12	216	3		
17HL4-1-13	226	401	0.56	0.05115	0.00255	0.22718	0.01055	0.03248	0.00043	247	82	208	9	206	3		
17HL4-1-14	826	2126	0.39	0.05526	0.00175	0.31967	0.00972	0.04195	0.00036	423	72	282	7	265	2		
17HL4-1-15	256	468	0.55	0.05158	0.00246	0.23594	0.01131	0.03294	0.00040	267	88	215	9	209	2		
17HL4-1-16	361	581	0.62	0.05416	0.00238	0.25963	0.01163	0.03457	0.00037	378	82	234	9	219	2		
17HL4-1-17	345	474	0.73	0.05137	0.00277	0.23389	0.01198	0.03340	0.00041	258	95	213	10	212	3		
17HL4-1-18	272	429	0.63	0.05263	0.00325	0.23923	0.01450	0.03297	0.00038	313	144	218	12	209	2		
17HL4-1-19	566	1320	0.43	0.05017	0.00146	0.32635	0.01007	0.04729	0.00068	203	45	287	8	298	4		
17HL4-1-20	732	1079	0.68	0.05102	0.00185	0.22939	0.00832	0.03246	0.00031	242	66	210	7	206	2		
17HL4-1-21	225	389	0.58	0.05128	0.00262	0.22539	0.01073	0.03205	0.00042	253	85	206	9	203	3		
17HL4-1-22	117	212	0.55	0.05335	0.00468	0.32277	0.02777	0.04388	0.00074	344	201	284	21	277	5		
17HL4-1-23	256	580	0.44	0.05138	0.00244	0.23934	0.01113	0.03369	0.00040	258	86	218	9	214	2		
17HL4-1-24	569	1516	0.38	0.05255	0.00127	0.31328	0.00765	0.04313	0.00038	309	40	277	6	272	2		
17HL4-1-25	712	1071	0.66	0.05040	0.01184	0.24665	0.05758	0.03549	0.00093	214	424	224	47	225	6		
17HL4-1-26	874	825	1.06	0.06195	0.00203	0.35545	0.01163	0.04157	0.00045	672	51	309	9	263	3		
17HL4-1-27	323	814	0.40	0.05699	0.00158	0.65209	0.01787	0.08298	0.00083	491	43	510	11	514	5		
17HL4-1-28	293	427	0.69	0.05304	0.00240	0.24245	0.01133	0.03276	0.00042	331	83	220	9	208	3		
17HL4-1-29	746	1645	0.45	0.05136	0.00143	0.24215	0.00672	0.03408	0.00030	257	47	220	5	216	2		
17HL4-1-30	447	829	0.54	0.05488	0.00171	0.31515	0.00978	0.04157	0.00043	407	51	278	8	263	3		
17HL4-1-31	675	965	0.70	0.05197	0.00160	0.31054	0.00927	0.04319	0.00039	284	52	275	7	273	2		
17HL4-1-32	326	429	0.76	0.05021	0.00271	0.21847	0.01109	0.03196	0.00044	205	92	201	9	203	3		
17HL4-1-33	325	548	0.59	0.05634	0.00179	0.60874	0.02008	0.07751	0.00081	466	54	483	13	481	5		
17HL4-1-34	654	662	0.99	0.05100	0.00201	0.22210	0.00869	0.03152	0.00039	241	67	204	7	200	2		
17HL4-1-35	718	854	0.84	0.04910	0.00201	0.21414	0.00849	0.03151	0.00032	153	74	197	7	200	2		
17HL4-1-36	200	345	0.58	0.05102	0.00246	0.23024	0.01115	0.03273	0.00041	242	89	210	9	208	3		
17HL4-1-37	489	679	0.72	0.04960	0.00217	0.22976	0.01029	0.03337	0.00040	176	82	210	8	212	3		
17HL4-1-38	447	1178	0.38	0.05051	0.00146	0.26381	0.00772	0.03773	0.00041	218	48	238	6	239	3		

Sample number	Th (ppm)	U (ppm)	Th/U	Isotopic ratios								Ages (Ma)					
				$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$		$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$			
				ratio	1 σ	ratio	1 σ	ratio	1 σ	age	1 σ	age	1 σ	age	1 σ	age	1 σ
17HL4-1-39	703	1344	0.52	0.05128	0.00132	0.22374	0.00585	0.03151	0.00029	253	43	205	5	200	2		
17HL4-1-40	387	632	0.61	0.04997	0.00226	0.21559	0.00894	0.03168	0.00038	194	74	198	7	201	2		
17HL4-1-41	874	1238	0.71	0.05078	0.00126	0.28781	0.00731	0.04101	0.00038	231	41	257	6	259	2		
17HL4-1-42	363	883	0.41	0.05108	0.00159	0.29164	0.00908	0.04147	0.00043	244	53	260	7	262	3		
17HL4-1-43	559	420	1.33	0.06396	0.00173	1.15848	0.03073	0.13151	0.00123	740	40	781	14	796	7		
17HL4-1-44	537	962	0.56	0.05054	0.00164	0.30820	0.01043	0.04402	0.00044	220	60	273	8	278	3		
17HL4-1-45	486	689	0.71	0.04908	0.00693	0.26869	0.03779	0.03970	0.00048	152	283	242	30	251	3		
17HL4-1-46	587	1475	0.40	0.05121	0.00143	0.28712	0.00811	0.04065	0.00038	250	48	256	6	257	2		
17HL4-1-47	1275	2152	0.59	0.05159	0.00114	0.27974	0.00609	0.03926	0.00031	267	35	250	5	248	2		
17HL4-1-48	266	1032	0.26	0.07016	0.00137	1.50654	0.02945	0.15527	0.00126	933	27	933	12	930	7		
17HL4-1-49	511	1038	0.49	0.05818	0.00151	0.60247	0.01567	0.07485	0.00063	536	42	479	10	465	4		
17HL4-1-50	1720	1539	1.12	0.05319	0.00157	0.25854	0.00757	0.03529	0.00038	337	47	233	6	224	2		
17HL4-1-51	445	1031	0.43	0.05730	0.00144	0.63802	0.01652	0.08039	0.00071	503	41	501	10	498	4		
17HL4-1-52	326	449	0.73	0.05353	0.00224	0.25283	0.01008	0.03446	0.00044	351	67	229	8	218	3		
17HL4-1-53	333	1971	0.17	0.05805	0.00109	0.69427	0.01396	0.08638	0.00085	532	27	535	8	534	5		
17HL4-1-54	788	1697	0.46	0.05201	0.00130	0.30954	0.00761	0.04298	0.00033	286	42	274	6	271	2		
17HL4-1-55	342	505	0.68	0.05125	0.00248	0.23110	0.01093	0.03273	0.00039	252	87	211	9	208	2		
17HL4-1-56	479	983	0.49	0.04969	0.00169	0.22298	0.00774	0.03239	0.00036	180	60	204	6	205	2		
17HL4-1-57	583	940	0.62	0.05079	0.00151	0.32737	0.00987	0.04687	0.00060	231	46	288	8	295	4		
17HL4-1-58	371	861	0.43	0.05295	0.00171	0.29963	0.00974	0.04091	0.00037	327	57	266	8	258	2		
17HL4-1-59	661	739	0.89	0.05136	0.00185	0.30460	0.01041	0.04320	0.00040	257	62	270	8	273	2		
17HL4-1-60	151	362	0.42	0.05629	0.00308	0.25404	0.01296	0.03293	0.00046	464	88	230	10	209	3		
17HL4-1-61	1018	1242	0.82	0.04912	0.00146	0.21836	0.00662	0.03213	0.00030	154	53	201	6	204	2		
17HL4-1-62	221	305	0.72	0.05170	0.00251	0.24434	0.01087	0.03439	0.00045	272	78	222	9	218	3		
17HL4-1-63	446	518	0.86	0.04958	0.00229	0.22699	0.01047	0.03339	0.00047	175	81	208	9	212	3		
17HL4-1-64	325	568	0.57	0.05492	0.00264	0.25855	0.01213	0.03436	0.00045	409	82	233	10	218	3		
17HL4-1-65	207	663	0.31	0.04778	0.00238	0.22198	0.01038	0.03423	0.00050	89	77	204	9	217	3		
13HL6-1 a mica schist																	
13HL6-1-01	996	1161	0.86	0.05306	0.00224	0.32543	0.01315	0.04449	0.00051	331	71	286	10	281	3		
13HL6-1-02	425	1247	0.34	0.05352	0.00206	0.35907	0.01369	0.04861	0.00056	351	65	312	10	306	3		
13HL6-1-03	1643	3095	0.53	0.05924	0.00133	0.65952	0.01451	0.08006	0.00068	576	33	514	9	496	4		
13HL6-1-04	468	1225	0.38	0.05180	0.00188	0.30690	0.01084	0.04275	0.00048	277	60	272	8	270	3		
13HL6-1-05	736	1778	0.41	0.05368	0.00189	0.32761	0.01135	0.04397	0.00046	358	59	288	9	277	3		
13HL6-1-06	518	1564	0.33	0.07129	0.00241	1.26361	0.04062	0.12856	0.00134	966	71	830	18	780	8		
13HL6-1-07	551	979	0.56	0.05603	0.00254	0.34581	0.01555	0.04470	0.00052	453	79	302	12	282	3		
13HL6-1-08	1245	2309	0.54	0.06048	0.00165	0.70026	0.01860	0.08380	0.00084	621	40	539	11	519	5		
13HL6-1-09	256	438	0.59	0.05629	0.00389	0.31119	0.01939	0.04181	0.00075	464	106	275	15	264	5		
13HL6-1-10	573	1362	0.42	0.05586	0.00165	0.57020	0.01683	0.07384	0.00079	447	46	458	11	459	5		
13HL6-1-11	1780	6779	0.26	0.05702	0.00125	0.59856	0.01396	0.07582	0.00086	492	32	476	9	471	5		
13HL6-1-12	323	631	0.51	0.07802	0.00236	1.56286	0.05129	0.14415	0.00185	1147	45	956	20	868	10		
13HL6-1-13	1118	3654	0.31	0.05840	0.00448	0.63912	0.04871	0.07937	0.00072	545	173	502	30	492	4		
13HL6-1-14	1218	1184	1.03	0.05278	0.00216	0.31812	0.01245	0.04402	0.00048	319	69	280	10	278	3		
13HL6-1-15	818	1472	0.56	0.07189	0.00177	1.54513	0.03770	0.15531	0.00136	983	35	949	15	931	8		

Sample number	Th (ppm)	U (ppm)	Th/U	Isotopic ratios								Ages (Ma)					
				$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$		$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$			
				ratio	1 σ	ratio	1 σ	ratio	1 σ	age	1 σ	age	1 σ	age	1 σ	age	1 σ
13HL6-1-16	434	1894	0.23	0.05728	0.00152	0.59556	0.01578	0.07498	0.00064	502	43	474	10	466	4		
13HL6-1-17	1188	2066	0.57	0.05107	0.00175	0.29582	0.00999	0.04176	0.00039	244	61	263	8	264	2		
13HL6-1-18	472	1329	0.36	0.06370	0.00392	0.85855	0.04888	0.09775	0.00229	732	134	629	27	601	13		
13HL6-1-19	666	1298	0.51	0.05631	0.00195	0.53632	0.01815	0.06867	0.00074	464	56	436	12	428	4		
13HL6-1-20	1611	1711	0.94	0.05059	0.00183	0.29926	0.01063	0.04259	0.00045	222	63	266	8	269	3		
13HL6-1-21	186	2782	0.07	0.07459	0.00196	1.29988	0.03168	0.12639	0.00124	1058	54	846	14	767	7		
13HL6-1-22	516	1243	0.41	0.05780	0.00175	0.64336	0.01859	0.08055	0.00079	522	46	504	11	499	5		
13HL6-1-23	1397	3595	0.39	0.05613	0.00134	0.62377	0.01500	0.07990	0.00075	457	37	492	9	496	4		
13HL6-1-24	690	883	0.78	0.05126	0.00213	0.31861	0.01249	0.04531	0.00055	252	68	281	10	286	3		
13HL6-1-25	746	1584	0.47	0.05749	0.00147	0.65926	0.01656	0.08230	0.00074	510	39	514	10	510	4		
13HL6-1-26	358	663	0.54	0.05539	0.00202	0.63400	0.02322	0.08199	0.00084	428	63	499	14	508	5		
13HL6-1-27	395	1031	0.38	0.05682	0.00183	0.66738	0.02089	0.08443	0.00093	485	50	519	13	523	6		
13HL6-1-28	940	1415	0.66	0.06000	0.00189	0.71344	0.02251	0.08499	0.00091	603	50	547	13	526	5		
13HL6-1-29	1406	2482	0.57	0.05868	0.00168	0.62779	0.01760	0.07653	0.00085	555	42	495	11	475	5		
13HL6-1-30	624	1182	0.53	0.05319	0.00236	0.32061	0.01378	0.04300	0.00049	337	77	282	11	271	3		
13HL6-1-31	407	595	0.68	0.05323	0.00403	0.31630	0.02348	0.04310	0.00064	339	174	279	18	272	4		
13HL6-1-32	3050	3195	0.95	0.05962	0.00139	0.68625	0.01602	0.08237	0.00069	590	36	531	10	510	4		
13HL6-1-33	1053	1400	0.75	0.05349	0.00194	0.40265	0.01519	0.05430	0.00070	350	62	344	11	341	4		
13HL6-1-34	429	1478	0.29	0.05713	0.00182	0.65410	0.02019	0.08283	0.00082	497	50	511	12	513	5		
13HL6-1-35	1478	1900	0.78	0.07467	0.00196	1.74764	0.04942	0.16831	0.00209	1060	37	1026	18	1003	12		
13HL6-1-36	754	1580	0.48	0.05686	0.00168	0.63913	0.01917	0.08097	0.00076	486	50	502	12	502	5		
13HL6-1-37	929	2675	0.35	0.05527	0.00135	0.64955	0.01594	0.08479	0.00079	423	38	508	10	525	5		
13HL6-1-38	1622	3412	0.48	0.05472	0.00125	0.64377	0.01496	0.08470	0.00073	401	37	505	9	524	4		
13HL6-1-39	1445	4999	0.29	0.05472	0.00122	0.60093	0.01425	0.07898	0.00085	401	34	478	9	490	5		
13HL6-1-40	980	958	1.02	0.05235	0.00205	0.43405	0.01673	0.06007	0.00061	301	69	366	12	376	4		
13HL6-1-41	367	2757	0.13	0.05651	0.00140	0.65415	0.01606	0.08324	0.00084	473	36	511	10	515	5		
13HL6-1-42	559	1112	0.50	0.05479	0.00165	0.62198	0.01869	0.08165	0.00076	403	51	491	12	506	5		
13HL6-1-43	2024	3560	0.57	0.05517	0.00156	0.31810	0.00876	0.04158	0.00040	419	44	280	7	263	3		
13HL6-1-44	1145	2176	0.53	0.06543	0.00158	1.21269	0.02858	0.13361	0.00117	788	35	806	13	808	7		
13HL6-1-45	838	1614	0.52	0.05783	0.00162	0.67429	0.01898	0.08403	0.00081	523	45	523	12	520	5		
13HL6-1-46	279	552	0.51	0.06073	0.00297	0.62200	0.02820	0.07440	0.00089	630	77	491	18	463	5		
13HL6-1-47	386	2153	0.18	0.05546	0.00153	0.61966	0.01707	0.08056	0.00074	431	45	490	11	499	4		
13HL6-1-48	462	1947	0.24	0.05694	0.00154	0.67198	0.01789	0.08516	0.00076	489	43	522	11	527	4		
13HL6-1-49	1567	2965	0.53	0.05660	0.00184	0.31858	0.01014	0.04062	0.00041	476	52	281	8	257	3		
13HL6-1-50	859	1204	0.71	0.05108	0.00193	0.31194	0.01185	0.04410	0.00050	244	66	276	9	278	3		
13HL6-1-51	414	1275	0.32	0.07600	0.00325	1.66051	0.06812	0.15846	0.00189	1095	88	994	26	948	11		
13HL6-1-52	2030	2702	0.75	0.04664	0.00168	0.27996	0.01002	0.04334	0.00053	31	54	251	8	273	3		
13HL6-1-53	66	176	0.37	0.13513	0.00399	7.58063	0.21313	0.40641	0.00537	2166	31	2183	25	2199	25		
13HL6-1-54	960	2876	0.33	0.05406	0.00130	0.67079	0.01795	0.08871	0.00111	373	38	521	11	548	7		
13HL6-1-55	606	857	0.71	0.05188	0.00233	0.30538	0.01330	0.04252	0.00052	280	77	271	10	268	3		
13HL6-1-56	500	1102	0.45	0.06591	0.00181	1.17834	0.03181	0.12847	0.00126	803	40	791	15	779	7		
13HL6-1-57	248	2172	0.11	0.05668	0.00158	0.70862	0.01982	0.08978	0.00092	479	44	544	12	554	5		
13HL6-1-58	594	627	0.95	0.05881	0.00282	0.68894	0.03281	0.08543	0.00133	560	77	532	20	528	8		

Sample number	Th (ppm)	U (ppm)	Th/U	Isotopic ratios								Ages (Ma)					
				$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$		$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$			
				ratio	1 σ	ratio	1 σ	ratio	1 σ	age	1 σ	age	1 σ	age	1 σ	age	1 σ
13HL6-1-59	460	2646	0.17	0.05834	0.00160	0.68494	0.01851	0.08432	0.00072	543	44	530	11	522	4		
13HL6-1-60	372	684	0.54	0.08123	0.00230	1.84073	0.05282	0.16300	0.00192	1227	38	1060	19	973	11		
13HL6-1-61	1408	3050	0.46	0.05400	0.00161	0.31857	0.00958	0.04231	0.00038	371	52	281	7	267	2		
13HL6-1-62	596	1551	0.38	0.05779	0.00224	0.65317	0.02448	0.08197	0.00081	522	87	510	15	508	5		
13HL6-1-63	2169	4598	0.47	0.06029	0.00149	0.64246	0.01624	0.07638	0.00076	614	37	504	10	475	5		
13HL6-1-64	1238	1785	0.69	0.05434	0.00204	0.31853	0.01192	0.04233	0.00047	385	64	281	9	267	3		
13HL6-1-65	1229	2121	0.58	0.05251	0.00183	0.30543	0.01040	0.04204	0.00040	307	60	271	8	265	2		
13HL6-1-66	1774	1042	1.70	0.05624	0.00259	0.32700	0.01516	0.04206	0.00051	462	81	287	12	266	3		
13HL6-1-67	992	902	1.10	0.06753	0.00237	0.78917	0.02851	0.08400	0.00090	854	57	591	16	520	5		
13HL6-1-68	8130	4974	1.63	0.05537	0.00125	0.57445	0.01318	0.07473	0.00068	427	35	461	8	465	4		
13HL6-1-69	1213	2228	0.54	0.05189	0.00198	0.30745	0.01188	0.04283	0.00048	281	68	272	9	270	3		
13HL6-1-70	1794	2779	0.65	0.05115	0.00158	0.29190	0.00893	0.04133	0.00043	248	51	260	7	261	3		
13HL6-1-71	570	643	0.89	0.05254	0.00297	0.31031	0.01710	0.04305	0.00059	309	101	274	13	272	4		
13HL6-1-72	796	2081	0.38	0.05907	0.00141	0.69660	0.01666	0.08510	0.00067	570	38	537	10	526	4		
13HL6-1-73	513	618	0.83	0.16118	0.00317	9.18220	0.17991	0.41109	0.00319	2468	23	2356	18	2220	15		
13HL6-1-74	661	1474	0.45	0.05680	0.00333	0.59832	0.03343	0.07640	0.00134	484	133	476	21	475	8		
13HL6-1-75	493	447	1.10	0.09223	0.00256	3.03883	0.08607	0.23789	0.00243	1472	38	1417	22	1376	13		
13HL6-1-76	1220	2446	0.50	0.05484	0.00186	0.31466	0.01048	0.04155	0.00043	406	56	278	8	262	3		
13HL6-1-77	456	959	0.48	0.05799	0.00196	0.64696	0.02160	0.08093	0.00083	529	55	507	13	502	5		
13HL6-1-78	1259	2163	0.58	0.05884	0.00143	0.63578	0.01567	0.07794	0.00073	561	37	500	10	484	4		
13HL6-1-79	906	2041	0.44	0.05792	0.00162	0.66867	0.01830	0.08348	0.00077	527	44	520	11	517	5		
13HL6-1-80	548	868	0.63	0.06116	0.00232	0.59792	0.02268	0.07081	0.00080	645	62	476	14	441	5		
13HL6-1-81	704	1008	0.70	0.05627	0.00198	0.54983	0.01919	0.07073	0.00090	463	55	445	13	441	5		
15MS12-1 an andesitic crystal–lithic tuff																	
15MS12-1-01	322	777	0.41	0.05394	0.00174	0.34526	0.01092	0.04647	0.00046	368	53	301	8	293	3		
15MS12-1-02	513	1108	0.46	0.05391	0.00105	0.34210	0.00649	0.04602	0.00027	367	32	299	5	290	2		
15MS12-1-03	145	2168	0.07	0.04893	0.00132	0.13354	0.00359	0.01978	0.00015	145	49	127	3	126	1		
15MS12-1-04	393	1618	0.24	0.04867	0.00195	0.13304	0.00514	0.01983	0.00021	132	93	127	5	127	1		
15MS12-1-05	462	661	0.70	0.05437	0.00188	0.34693	0.01178	0.04628	0.00030	386	80	302	9	292	2		
15MS12-1-06	622	1118	0.56	0.05406	0.00101	0.34614	0.00673	0.04630	0.00028	374	33	302	5	292	2		
15MS12-1-07	625	1249	0.50	0.05187	0.00148	0.32971	0.00917	0.04610	0.00030	280	67	289	7	291	2		
15MS12-1-08	575	1544	0.37	0.06473	0.00128	0.41411	0.00831	0.04636	0.00035	765	29	352	6	292	2		
15MS12-1-09	483	1116	0.43	0.05368	0.00140	0.34198	0.00871	0.04620	0.00028	358	60	299	7	291	2		
15MS12-1-10	1012	1586	0.64	0.05463	0.00265	0.34601	0.01651	0.04594	0.00040	397	112	302	12	290	2		
15MS12-1-11	734	1287	0.57	0.05195	0.00099	0.33262	0.00630	0.04648	0.00027	283	33	292	5	293	2		
15MS12-1-12	428	1935	0.22	0.04848	0.00110	0.13282	0.00305	0.01994	0.00017	123	38	127	3	127	1		
15MS12-1-13	423	1238	0.34	0.05041	0.00095	0.32106	0.00612	0.04617	0.00028	214	33	283	5	291	2		
15MS6-1 a rhyolitic crystal tuff																	
15MS6-1-01	507	834	0.61	0.05219	0.00198	0.33371	0.01250	0.04643	0.00041	294	69	292	10	293	3		
15MS6-1-02	441	714	0.62	0.05488	0.00236	0.35389	0.01659	0.04661	0.00062	407	81	308	12	294	4		
15MS6-1-03	1580	6523	0.24	0.05207	0.00151	0.14123	0.00397	0.01967	0.00014	288	68	134	4	126	1		
15MS6-1-04	308	3260	0.09	0.05172	0.00191	0.13814	0.00496	0.01937	0.00017	273	87	131	4	124	1		
15MS6-1-05	696	610	1.14	0.06338	0.00291	0.39928	0.01889	0.04584	0.00051	721	82	341	14	289	3		

Sample number	Th (ppm)	U (ppm)	Th/U	Isotopic ratios								Ages (Ma)					
				$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$		$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$			
				ratio	1 σ	ratio	1 σ	ratio	1 σ	age	1 σ	age	1 σ	age	1 σ		
15MS6-1-06	198	287	0.69	0.05306	0.00368	0.33007	0.02296	0.04558	0.00060	331	135	290	18	287	4		
15MS6-1-07	260	206	1.26	0.05716	0.00483	0.35510	0.02911	0.04595	0.00073	498	154	309	22	290	5		
15MS6-1-08	174	1856	0.09	0.12315	0.00185	6.08882	0.08239	0.35860	0.00236	2002	27	1989	12	1976	11		
15MS6-1-09	202	247	0.82	0.05549	0.00442	0.35418	0.02878	0.04615	0.00071	432	155	308	22	291	4		
15MS6-1-10	1186	1282	0.93	0.05314	0.00198	0.33720	0.01246	0.04613	0.00043	335	67	295	9	291	3		
15MS6-1-11	186	401	0.46	0.05478	0.00359	0.36632	0.02554	0.04883	0.00114	403	114	317	19	307	7		
15MS6-1-12	505	3285	0.15	0.05042	0.00336	0.13500	0.00885	0.01942	0.00023	214	153	129	8	124	1		
15MS6-1-13	125	234	0.54	0.05403	0.01015	0.32142	0.05766	0.04559	0.00130	372	332	283	44	287	8		
15MS6-1-14	252	426	0.59	0.05778	0.00833	0.34116	0.05463	0.04240	0.00055	522	334	298	41	268	3		
15MS6-1-15	1209	3478	0.35	0.05449	0.00426	0.14578	0.01135	0.01940	0.00015	391	180	138	10	124	1		
15MS6-1-16	272	435	0.62	0.05273	0.00152	0.30849	0.00879	0.04242	0.00038	317	48	273	7	268	2		
15MS6-1-17	445	1455	0.31	0.05131	0.00126	0.14329	0.00351	0.02026	0.00017	255	41	136	3	129	1		
15MS6-1-18	479	816	0.59	0.05240	0.00113	0.32988	0.00677	0.04568	0.00028	303	36	289	5	288	2		
15MS6-1-19	645	4269	0.15	0.05048	0.00264	0.13663	0.00705	0.01963	0.00016	217	122	130	6	125	1		
15MS6-1-20	398	265	1.50	0.05185	0.00228	0.31291	0.01364	0.04388	0.00049	279	80	276	11	277	3		
15MS13-1 a trachytic andesite																	
15MS13-1-01	1277	1666	0.77	0.04474	0.00220	0.10860	0.00557	0.01747	0.00019	-33	88	105	5	112	1		
15MS13-1-02	758	1360	0.56	0.04844	0.00258	0.11291	0.00581	0.01691	0.00020	121	93	109	5	108	1		
15MS13-1-03	1612	1935	0.83	0.04403	0.00195	0.10192	0.00432	0.01695	0.00017	-69	72	99	4	108	1		
15MS13-1-04	959	1337	0.72	0.04768	0.00288	0.11021	0.00657	0.01688	0.00019	83	110	106	6	108	1		
15MS13-1-05	740	759	0.98	0.05369	0.00592	0.12176	0.01311	0.01692	0.00035	358	205	117	12	108	2		
15MS13-1-06	486	908	0.53	0.05045	0.00483	0.11299	0.01087	0.01704	0.00032	216	182	109	10	109	2		
15MS13-1-07	463	874	0.53	0.05146	0.00399	0.11708	0.00887	0.01690	0.00023	261	147	112	8	108	1		
15MS13-1-08	463	775	0.60	0.04794	0.00443	0.11139	0.01006	0.01662	0.00026	96	172	107	9	106	2		
15MS13-1-09	298	485	0.61	0.04758	0.00596	0.11157	0.01334	0.01687	0.00032	78	226	107	12	108	2		
15MS13-1-10	1918	2158	0.89	0.05177	0.00233	0.12021	0.00506	0.01694	0.00017	275	78	115	5	108	1		
15MS13-1-11	1813	2199	0.82	0.04796	0.00256	0.11296	0.00594	0.01708	0.00016	97	120	109	5	109	1		
15MS13-1-12	906	1416	0.64	0.04411	0.00269	0.10270	0.00616	0.01689	0.00020	-65	107	99	6	108	1		
15MS13-1-13	556	911	0.61	0.04973	0.00381	0.11487	0.00836	0.01729	0.00027	183	135	110	8	111	2		
15MS13-1-14	643	796	0.81	0.05437	0.00834	0.12423	0.01883	0.01657	0.00039	386	329	119	17	106	2		
15MS13-1-15	1285	1663	0.77	0.04793	0.00246	0.11111	0.00555	0.01691	0.00020	96	89	107	5	108	1		
15MS13-1-16	290	616	0.47	0.05611	0.00961	0.12964	0.02196	0.01676	0.00042	457	369	124	20	107	3		
15MS13-1-17	636	866	0.73	0.05690	0.00569	0.13031	0.01324	0.01696	0.00036	488	189	124	12	108	2		
15MS13-1-18	1249	1088	1.15	0.04805	0.00465	0.10896	0.01018	0.01672	0.00031	102	174	105	9	107	2		
15MS13-1-19	1103	1492	0.74	0.05278	0.00316	0.12663	0.00754	0.01735	0.00022	319	113	121	7	111	1		
17HL2-1 a feldspathic quartz sandstone																	
17HL2-1-01	1054	2025	0.52	0.05298	0.00180	0.14708	0.00503	0.02027	0.00028	328	52	139	4	129	2		
17HL2-1-02	1274	940	1.36	0.04838	0.00148	0.16861	0.00499	0.02533	0.00021	118	54	158	4	161	1		
17HL2-1-03	1109	965	1.15	0.05347	0.00134	0.36350	0.00945	0.04920	0.00042	349	43	315	7	310	3		
17HL2-1-04	1697	1430	1.19	0.05353	0.00322	0.19051	0.01122	0.02581	0.00031	351	139	177	10	164	2		
17HL2-1-05	330	569	0.58	0.04714	0.00219	0.12262	0.00543	0.01900	0.00023	56	74	117	5	121	1		
17HL2-1-06	228	281	0.81	0.04974	0.00249	0.19846	0.00965	0.02912	0.00040	183	87	184	8	185	3		
17HL2-1-07	329	424	0.78	0.04827	0.00276	0.12289	0.00686	0.01846	0.00022	113	128	118	6	118	1		

Sample number	Th (ppm)	U (ppm)	Th/U	Isotopic ratios								Ages (Ma)					
				$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$		$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$			
				ratio	1 σ	ratio	1 σ	ratio	1 σ	age	1 σ	age	1 σ	age	1 σ		
17HL2-1-08	461	570	0.81	0.04787	0.00154	0.17599	0.00616	0.02660	0.00034	93	57	165	5	169	2		
17HL2-1-09	478	610	0.78	0.05232	0.00202	0.23422	0.00921	0.03241	0.00039	299	68	214	8	206	2		
17HL2-1-10	866	1256	0.69	0.05034	0.00205	0.21420	0.00888	0.03092	0.00042	211	71	197	7	196	3		
17HL2-1-11	592	937	0.63	0.05159	0.00500	0.13236	0.01267	0.01861	0.00028	267	221	126	11	119	2		
17HL2-1-12	1711	2580	0.66	0.05014	0.00171	0.19738	0.00687	0.02850	0.00032	201	60	183	6	181	2		
17HL2-1-13	1613	1584	1.02	0.04990	0.00386	0.12191	0.00818	0.01796	0.00033	190	119	117	7	115	2		
17HL2-1-14	1011	1173	0.86	0.05208	0.00421	0.12765	0.00882	0.01822	0.00030	289	128	122	8	116	2		
17HL2-1-15	363	410	0.89	0.05302	0.00203	0.22858	0.00848	0.03126	0.00031	330	89	209	7	198	2		
17HL2-1-16	271	241	1.13	0.05069	0.00243	0.20230	0.00937	0.02940	0.00047	227	77	187	8	187	3		
17HL2-1-17	4425	2325	1.90	0.05147	0.00528	0.18347	0.01872	0.02585	0.00028	262	235	171	16	165	2		
17HL2-1-18	332	471	0.71	0.05170	0.00173	0.21632	0.00687	0.03043	0.00026	272	57	199	6	193	2		
17HL2-1-19	1007	860	1.17	0.05129	0.00167	0.23095	0.00718	0.03274	0.00029	254	55	211	6	208	2		
17HL2-1-20	1040	2298	0.45	0.05022	0.00151	0.17244	0.00515	0.02488	0.00023	205	52	162	4	158	1		
17HL2-1-21	178	240	0.74	0.05096	0.00180	0.21283	0.00769	0.03033	0.00035	239	62	196	6	193	2		
17HL2-1-22	376	489	0.77	0.04861	0.00228	0.18504	0.00818	0.02818	0.00042	129	74	172	7	179	3		
17HL2-1-23	336	446	0.75	0.04800	0.00556	0.12003	0.01378	0.01814	0.00029	99	245	115	12	116	2		
17HL2-1-24	274	355	0.77	0.05171	0.00104	0.26214	0.00554	0.03666	0.00039	272	29	236	4	232	2		
17HL2-1-25	1022	1116	0.92	0.05157	0.00210	0.13171	0.00535	0.01857	0.00022	267	71	126	5	119	1		
17HL2-1-26	438	711	0.62	0.05117	0.00143	0.22570	0.00615	0.03196	0.00024	249	49	207	5	203	2		
17HL2-1-27	678	645	1.05	0.05383	0.00540	0.14058	0.01391	0.01894	0.00032	364	229	134	12	121	2		
17HL2-1-28	619	705	0.88	0.05307	0.00109	0.18873	0.00387	0.02576	0.00022	332	31	176	3	164	1		
17HL2-1-29	241	363	0.66	0.04991	0.00277	0.11850	0.00566	0.01780	0.00029	191	80	114	5	114	2		
17HL2-1-30	829	1034	0.80	0.04403	0.00259	0.11078	0.00625	0.01823	0.00028	-69	93	107	6	116	2		
17HL2-1-31	1089	1647	0.66	0.05218	0.00211	0.28460	0.01222	0.03953	0.00046	293	77	254	10	250	3		
17HL2-1-32	613	746	0.82	0.05168	0.00252	0.27932	0.01356	0.03921	0.00057	271	85	250	11	248	4		
17HL2-1-33	2117	2026	1.04	0.05157	0.00147	0.29185	0.00768	0.04123	0.00040	266	42	260	6	260	3		
17HL2-1-34	340	3031	0.11	0.04779	0.00135	0.17840	0.00491	0.02714	0.00025	89	47	167	4	173	2		
17HL2-1-35	1632	1508	1.08	0.04883	0.00303	0.27167	0.01494	0.04057	0.00057	140	99	244	12	256	4		
17HL2-1-36	820	1365	0.60	0.04765	0.00474	0.11051	0.00943	0.01744	0.00039	82	147	106	9	111	2		
17HL2-1-37	568	942	0.60	0.04799	0.00196	0.16305	0.00661	0.02489	0.00034	99	67	153	6	158	2		
17HL2-1-38	432	1443	0.30	0.05277	0.00253	0.22952	0.01024	0.03201	0.00036	319	81	210	8	203	2		
17HL2-1-39	529	775	0.68	0.05103	0.00420	0.12516	0.00873	0.01823	0.00031	242	128	120	8	116	2		
17HL2-1-40	542	802	0.68	0.04718	0.00336	0.12018	0.00685	0.01913	0.00028	58	97	115	6	122	2		
17HL2-1-41	269	770	0.35	0.05272	0.00149	0.25506	0.00727	0.03507	0.00034	317	47	231	6	222	2		
17HL2-1-42	359	759	0.47	0.05062	0.00232	0.20770	0.00924	0.02976	0.00032	223	108	192	8	189	2		
17HL2-1-43	579	492	1.18	0.05392	0.00270	0.19407	0.00954	0.02618	0.00028	368	92	180	8	167	2		
17HL2-1-44	598	1433	0.42	0.05192	0.00276	0.21663	0.01088	0.03049	0.00038	282	93	199	9	194	2		
17HL2-1-45	481	964	0.50	0.05320	0.00178	0.28321	0.00956	0.03865	0.00036	337	59	253	8	244	2		
17HL2-1-46	281	599	0.47	0.05372	0.00348	0.13839	0.00885	0.01868	0.00019	359	150	132	8	119	1		
17HL2-1-47	457	488	0.94	0.05060	0.00192	0.21638	0.00838	0.03105	0.00034	223	69	199	7	197	2		
17HL2-1-48	1004	1130	0.89	0.05166	0.00115	0.31789	0.00723	0.04462	0.00041	270	35	280	6	281	3		
17HL2-1-49	462	627	0.74	0.05131	0.00204	0.27086	0.01066	0.03847	0.00043	255	70	243	9	243	3		
17HL2-1-50	393	418	0.94	0.05250	0.00174	0.28822	0.00969	0.03995	0.00046	307	56	257	8	253	3		

Sample number	Th (ppm)	U (ppm)	Th/U	Isotopic ratios								Ages (Ma)					
				$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$		$^{207}\text{Pb}/^{206}\text{Pb}$		$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$			
				ratio	1 σ	ratio	1 σ	ratio	1 σ	age	1 σ	age	1 σ	age	1 σ		
17HL2-1-51	636	886	0.72	0.04812	0.00172	0.18169	0.00655	0.02737	0.00027	105	64	170	6	174	2		
17HL2-1-52	427	525	0.81	0.04766	0.00256	0.18583	0.00985	0.02858	0.00038	83	93	173	8	182	2		
17HL2-1-53	1462	1498	0.98	0.05226	0.00232	0.28906	0.01228	0.04020	0.00044	297	77	258	10	254	3		
17HL2-1-54	182	864	0.21	0.05122	0.00283	0.28825	0.01518	0.04116	0.00055	251	97	257	12	260	3		
17HL2-1-55	431	314	1.37	0.05529	0.00184	0.50701	0.01661	0.06641	0.00073	424	53	416	11	414	4		
17HL2-1-56	451	371	1.21	0.05355	0.00226	0.36575	0.01496	0.04954	0.00051	352	98	317	11	312	3		
17HL2-1-57	119	196	0.61	0.04836	0.00427	0.19025	0.01400	0.02953	0.00053	117	131	177	12	188	3		
17HL2-1-58	471	380	1.24	0.04908	0.00158	0.23354	0.00806	0.03451	0.00065	152	46	213	7	219	4		
17HL2-1-59	924	957	0.97	0.05233	0.00158	0.24401	0.00729	0.03369	0.00031	300	52	222	6	214	2		
17HL2-1-60	329	471	0.70	0.05146	0.00187	0.20440	0.00732	0.02886	0.00030	261	63	189	6	183	2		
17HL2-1-61	354	349	1.02	0.05305	0.00388	0.27515	0.01929	0.03851	0.00088	331	117	247	15	244	5		
17HL2-1-62	480	875	0.55	0.05060	0.00188	0.17253	0.00640	0.02473	0.00028	222	65	162	6	158	2		
17HL2-1-63	670	1091	0.61	0.05026	0.00181	0.19223	0.00735	0.02758	0.00031	207	68	179	6	175	2		
17HL2-1-64	1384	1570	0.88	0.05183	0.00189	0.27414	0.01005	0.03858	0.00051	278	59	246	8	244	3		
17HL2-1-65	941	1400	0.67	0.05165	0.00205	0.20753	0.00812	0.02926	0.00033	270	69	191	7	186	2		
17HL2-1-66	1868	1335	1.40	0.05494	0.00468	0.29936	0.02506	0.03952	0.00063	410	195	266	20	250	4		
17HL2-1-67	755	672	1.12	0.04993	0.00269	0.21283	0.01097	0.03142	0.00044	192	94	196	9	199	3		
17HL2-1-68	286	397	0.72	0.05204	0.00378	0.21258	0.01367	0.03031	0.00047	287	119	196	11	192	3		

TABLE A2. ZIRCON Hf ISOTOPIC DATA OF MESOZOIC STRATA IN THE EASTERN JIAMUSI MASSIF

Sample number	t(Ma)	$^{176}\text{Yb}/^{177}\text{Hf}$	$^{176}\text{Lu}/^{177}\text{Hf}$	$^{176}\text{Hf}/^{177}\text{Hf}$	$2\sigma_m$	$\varepsilon_{\text{Hf}}(t)$	2σ	$T_{\text{DM1}}(\text{Ma})$	$T_{\text{DM2}}(\text{Ma})$	$f_{\text{Lu/Hf}}$
15MS1-1 a tuffaceous feldspathic quartz sandstone										
15MS1-1-01	293	0.038878	0.001483	0.282609	0.000035	0.4	1.24	923	1286	-0.96
15MS1-1-02	291	0.043635	0.001613	0.282620	0.000045	0.7	1.61	910	1264	-0.95
15MS1-1-03	273	0.024703	0.000984	0.282640	0.000039	1.2	1.37	866	1221	-0.97
15MS1-1-04	290	0.037165	0.001441	0.282621	0.000036	0.8	1.26	903	1259	-0.96
15MS1-1-05	290	0.039650	0.001527	0.282593	0.000047	-0.3	1.65	946	1324	-0.95
15MS1-1-06	293	0.044011	0.001719	0.282618	0.000038	0.7	1.33	915	1268	-0.95
15MS1-1-07	298	0.047990	0.001833	0.282551	0.000048	-1.6	1.70	1014	1417	-0.94
15MS1-1-08	346	0.038688	0.001543	0.282647	0.000044	2.8	1.55	869	1170	-0.95
15MS1-1-09	296	0.049432	0.001888	0.282591	0.000033	-0.3	1.18	959	1330	-0.94
15MS1-1-10	297	0.036576	0.001351	0.282677	0.000039	2.9	1.40	823	1129	-0.96
15MS1-1-11	263	0.033485	0.001250	0.282533	0.000026	-2.9	0.92	1024	1472	-0.96
15MS1-1-12	269	0.058459	0.002100	0.282645	0.000068	1.1	2.39	885	1225	-0.94
15MS1-1-13	268	0.013584	0.000548	0.282624	0.000032	0.5	1.12	879	1256	-0.98
15MS1-1-14	503	0.015017	0.000600	0.282493	0.000033	1.0	1.16	1062	1406	-0.98
15MS1-1-15	513	0.010622	0.000400	0.282401	0.000027	-2.0	0.97	1184	1603	-0.99
15MS1-1-16	526	0.018370	0.000720	0.282481	0.000033	1.0	1.16	1083	1422	-0.98
15MS1-1-17	511	0.008232	0.000339	0.282237	0.000033	-7.8	1.16	1407	1969	-0.99
15MS1-1-18	268	0.030092	0.001196	0.282553	0.000040	-2.1	1.41	994	1422	-0.96
15MS1-1-19	501	0.009827	0.000372	0.282399	0.000040	-2.3	1.40	1185	1613	-0.99
15MS1-1-20	938	0.045733	0.001769	0.282216	0.000033	0.02	1.17	1491	1803	-0.95
15MS1-1-21	948	0.013168	0.000532	0.282194	0.000029	0.2	1.02	1473	1797	-0.98
15MS12-1 an andesitic crystal–lithic tuff										
15MS12-1-01	127	0.030325	0.001202	0.282790	0.000052	3.3	2.09	658	863	-0.96
15MS12-1-02	127	0.014734	0.000590	0.282777	0.000032	2.9	1.56	666	887	-0.98
15MS12-1-03	291	0.030788	0.001277	0.282714	0.000028	4.1	1.47	768	951	-0.96
15MS12-1-04	291	0.030948	0.001219	0.282649	0.000028	1.8	1.47	859	1079	-0.96
15MS12-1-05	291	0.026514	0.001063	0.282696	0.000032	3.5	1.57	789	984	-0.97
15MS12-1-06	291	0.049515	0.001883	0.282664	0.000042	2.2	1.84	853	1056	-0.94
15MS12-1-07	127	0.028962	0.001140	0.282828	0.000036	2.2	1.62	603	833	-0.97
15MS12-1-08	291	0.015569	0.000616	0.282553	0.000028	-1.5	1.43	980	1261	-0.98
15MS6-1 a rhyolitic crystal tuff										
15MS6-1-01	125	0.035520	0.001411	0.282822	0.000064	4.4	2.52	616	802	-0.96
15MS6-1-02	125	0.018085	0.000725	0.282877	0.000034	6.4	1.60	528	691	-0.98
15MS6-1-03	290	0.030449	0.001212	0.282752	0.000040	5.4	1.80	713	876	-0.96
15MS6-1-04	290	0.037556	0.001562	0.282725	0.000042	4.4	1.86	758	933	-0.95
15MS6-1-05	290	0.021625	0.000879	0.282738	0.000032	5.0	1.58	727	901	-0.97
15MS6-1-06	290	0.082966	0.003076	0.282756	0.000042	5.2	1.88	744	889	-0.91
15MS6-1-07	290	0.015659	0.000625	0.282830	0.000046	8.3	1.96	592	715	-0.98
15MS6-1-08	125	0.038163	0.001540	0.282843	0.000048	5.1	2.00	588	761	-0.95
15MS6-1-09	125	0.020910	0.000843	0.282780	0.000034	3.0	1.58	665	882	-0.97

Sample number	t(Ma)	$^{176}\text{Yb}/^{177}\text{Hf}$	$^{176}\text{Lu}/^{177}\text{Hf}$	$^{176}\text{Hf}/^{177}\text{Hf}$	$2\sigma_m$	$\varepsilon_{\text{Hf}}(t)$	2σ	$T_{\text{DM1}}(\text{Ma})$	$T_{\text{DM2}}(\text{Ma})$	$f_{\text{Lu/Hf}}$
15MS13-1 a trachytic andesite										
15MS13-1-01	108	0.032895	0.001342	0.282970	0.000038	9.3	1.71	403	516	-0.96
15MS13-1-02	108	0.029764	0.001210	0.282917	0.000034	7.4	1.61	478	621	-0.96
15MS13-1-03	108	0.042234	0.001682	0.282989	0.000044	9.9	1.89	380	480	-0.95
15MS13-1-04	108	0.032817	0.001347	0.282944	0.000046	8.4	1.91	440	567	-0.96
15MS13-1-05	108	0.033729	0.001371	0.282955	0.000036	8.7	1.66	425	546	-0.96
15MS13-1-06	108	0.020063	0.000809	0.282896	0.000036	6.7	1.64	502	661	-0.98
15MS13-1-07	108	0.049334	0.001962	0.283021	0.000046	11.1	1.94	335	416	-0.94
15MS13-1-08	108	0.058934	0.002383	0.282946	0.000056	8.3	2.25	451	569	-0.93
15MS13-1-09	108	0.039165	0.001597	0.282954	0.000040	8.7	1.77	429	548	-0.95
15MS13-1-10	108	0.045746	0.001832	0.282928	0.000044	7.8	1.89	469	601	-0.94