

Appendix Table

Grain number	$^{207}\text{Pb}/^{235}\text{U}$		$^{206}\text{Pb}/^{238}\text{U}$		Th/U	Age (Ma)		Conc.(%)	
						$^{207}\text{Pb}/^{235}\text{U}$	$^{206}\text{Pb}/^{238}\text{U}$		
Chl zone									
(Middle Minawa F.)									
ss16-83-1	0.117 ±	0.00641	0.018 ±	0.00043	0.5	112.7 ±	5.82	115.0 ±	2.75 98.0
ss16-83-4	0.133 ±	0.00808	0.019 ±	0.00048	0.5	126.9 ±	7.24	121.7 ±	3.03 104.3
ss16-83-5	0.097 ±	0.00577	0.015 ±	0.00036	0.7	93.9 ±	5.34	93.0 ±	2.29 100.9
ss16-83-6	0.125 ±	0.00582	0.018 ±	0.00043	0.6	119.4 ±	5.26	116.6 ±	2.70 102.4
ss16-83-10	0.105 ±	0.00411	0.015 ±	0.00035	0.6	101.2 ±	3.78	99.0 ±	2.22 102.3
ss16-83-11	0.129 ±	0.00363	0.019 ±	0.00041	1.0	123.4 ±	3.27	120.6 ±	2.59 102.3
ss16-83-20	0.125 ±	0.00462	0.018 ±	0.00037	0.6	119.3 ±	4.17	113.8 ±	2.36 104.8
ss16-83-21	0.281 ±	0.00885	0.040 ±	0.00081	0.7	251.7 ±	7.01	252.0 ±	5.03 99.9
ss16-83-28	0.118 ±	0.00570	0.017 ±	0.00038	0.5	113.1 ±	5.18	110.8 ±	2.43 102.0
Grt zone									
(Upper Minawa F.)									
ss16-27-6	0.112 ±	0.00583	0.017 ±	0.00031	0.6	107.7 ±	5.32	107.9 ±	1.96 99.8
ss16-27-7	0.109 ±	0.00525	0.016 ±	0.00029	0.4	104.8 ±	4.81	102.7 ±	1.82 102.0
ss16-27-8	0.117 ±	0.01108	0.018 ±	0.00045	0.4	112.4 ±	10.07	115.2 ±	2.87 97.6
ss16-27-9	0.109 ±	0.00381	0.016 ±	0.00026	0.7	104.8 ±	3.48	102.8 ±	1.64 102.0
ss16-27-12	0.117 ±	0.00471	0.017 ±	0.00029	0.4	112.5 ±	4.28	109.7 ±	1.82 102.6
ss16-39-1	0.102 ±	0.00499	0.015 ±	0.00034	0.4	98.8 ±	4.59	97.7 ±	2.13 101.1
ss16-39-2	0.109 ±	0.00326	0.016 ±	0.00032	0.3	104.6 ±	2.99	102.7 ±	2.05 101.8
ss16-39-3	0.117 ±	0.00494	0.017 ±	0.00037	0.5	112.3 ±	4.49	110.7 ±	2.33 101.5
ss16-39-7	0.125 ±	0.00539	0.018 ±	0.00039	0.2	119.6 ±	4.86	115.2 ±	2.44 103.8
ss16-39-8	0.132 ±	0.00608	0.020 ±	0.00044	0.5	125.8 ±	5.45	129.8 ±	2.78 96.9
ss16-39-9	0.283 ±	0.00784	0.039 ±	0.00077	0.7	253.4 ±	6.21	244.0 ±	4.77 103.9
ss16-39-10	0.137 ±	0.00509	0.020 ±	0.00041	0.3	130.6 ±	4.55	127.2 ±	2.61 102.7
ss16-39-12	0.117 ±	0.00483	0.017 ±	0.00036	0.5	112.1 ±	4.39	107.5 ±	2.26 104.3
ss16-39-13	0.124 ±	0.00485	0.018 ±	0.00038	1.3	119.1 ±	4.38	116.9 ±	2.42 101.9
ss16-39-14	6.981 ±	0.17427	0.391 ±	0.00775	0.6	2109.0 ±	22.17	2127.3 ±	35.92 99.1
ss16-39-18	0.122 ±	0.00652	0.019 ±	0.00042	0.3	117.1 ±	5.90	119.9 ±	2.66 97.7
ss16-39-21	0.134 ±	0.00741	0.020 ±	0.00045	0.5	127.8 ±	6.63	126.3 ±	2.84 101.2
ss16-39-23	0.317 ±	0.01040	0.044 ±	0.00089	1.0	279.3 ±	8.02	278.0 ±	5.52 100.5
ss16-39-28	0.200 ±	0.00575	0.028 ±	0.00056	0.2	185.5 ±	4.86	178.7 ±	3.51 103.8
Ab-Bt zone									
(Upper Minawa F.)									
ss16-3-3	0.119 ±	0.0058	0.0173 ±	0.00039	0.2	114.6 ±	5.28	110.8 ±	2.50 103.4
ss16-3-4	0.120 ±	0.0059	0.0180 ±	0.00041	0.7	114.6 ±	5.38	114.7 ±	2.59 100.0
ss16-3-6	0.117 ±	0.0054	0.0169 ±	0.00038	0.6	112.4 ±	4.91	108.2 ±	2.41 103.8
ss16-3-7	0.114 ±	0.0039	0.0168 ±	0.00036	0.3	110.0 ±	3.53	107.2 ±	2.25 102.6
ss16-3-8	0.109 ±	0.0045	0.0167 ±	0.00036	0.4	105.5 ±	4.10	106.8 ±	2.31 98.8
ss16-3-9	0.315 ±	0.0124	0.0435 ±	0.00095	0.7	277.7 ±	9.59	274.3 ±	5.86 101.2
ss16-3-10	0.107 ±	0.0062	0.0166 ±	0.00039	0.4	103.1 ±	5.71	106.1 ±	2.49 97.2
ss16-3-12	0.116 ±	0.0073	0.0169 ±	0.00041	0.7	111.5 ±	6.60	107.8 ±	2.62 103.5
ss16-3-13	0.302 ±	0.0127	0.0417 ±	0.00092	0.8	268.3 ±	9.92	263.3 ±	5.70 101.9
ss16-3-15	0.114 ±	0.0038	0.0170 ±	0.00036	0.3	109.7 ±	3.51	108.6 ±	2.27 101.0
ss16-3-16	0.104 ±	0.0045	0.0162 ±	0.00035	0.4	100.9 ±	4.09	103.4 ±	2.25 97.5
ss16-3-17	0.120 ±	0.0058	0.0175 ±	0.00040	0.4	115.3 ±	5.28	112.1 ±	2.52 102.8
ss16-3-23	0.125 ±	0.0046	0.0182 ±	0.00039	0.3	119.7 ±	4.14	116.4 ±	2.47 102.9
ss16-3-25	0.119 ±	0.0044	0.0170 ±	0.00036	0.7	113.7 ±	3.96	108.9 ±	2.31 104.4
ss16-3-26	0.300 ±	0.0121	0.0402 ±	0.00088	0.6	266.0 ±	9.46	254.0 ±	5.45 104.7
ss16-3-28	0.115 ±	0.0048	0.0168 ±	0.00037	0.7	110.8 ±	4.40	107.6 ±	2.34 102.9
ss16-38-4	0.108 ±	0.00398	0.016 ±	0.00042	1.4	104.0 ±	3.64	100.1 ±	2.66 103.9
ss16-38-6	0.327 ±	0.01021	0.044 ±	0.00117	1.3	287.3 ±	7.82	279.3 ±	7.22 102.9
ss16-38-13	0.100 ±	0.00916	0.015 ±	0.00048	0.5	97.0 ±	8.45	93.3 ±	3.02 104.0
ss16-38-15	0.113 ±	0.00531	0.017 ±	0.00036	0.9	109.1 ±	4.84	109.3 ±	2.26 99.8
ss16-38-16	0.301 ±	0.01183	0.042 ±	0.00085	0.8	266.9 ±	9.24	266.6 ±	5.25 100.1
ss16-38-24	0.138 ±	0.00404	0.020 ±	0.00038	0.4	131.1 ±	3.61	127.0 ±	2.40 103.2
ss16-38-27	0.300 ±	0.01028	0.041 ±	0.00080	0.5	266.8 ±	8.02	256.8 ±	4.93 103.9
ss16-38-28	0.108 ±	0.00453	0.016 ±	0.00033	0.4	104.5 ±	4.15	104.6 ±	2.10 99.9

Ab-Bt zone (Ojoin F.)										
SO55-2	7.017 ±	0.4587	0.378 ±	0.0233	0.7	2113.6 ±	58.09	2064.8 ±	109.00	102.4
SO55-4	0.574 ±	0.0469	0.074 ±	0.0046	1.2	460.7 ±	30.23	461.9 ±	27.71	99.7
SO55-5	0.105 ±	0.0116	0.015 ±	0.0010	0.5	101.1 ±	10.68	96.8 ±	6.07	104.5
SO55-6	0.374 ±	0.0290	0.050 ±	0.0030	1.5	322.4 ±	21.43	313.5 ±	18.68	102.8
SO55-7	0.118 ±	0.0182	0.017 ±	0.0012	0.2	113.6 ±	16.49	108.7 ±	7.34	104.5
SO55-11	0.099 ±	0.0080	0.015 ±	0.0009	0.4	96.0 ±	7.41	95.7 ±	5.74	100.3
SO55-14	0.119 ±	0.0157	0.017 ±	0.0011	0.5	114.3 ±	14.22	110.0 ±	7.16	104.0
SO55-17	0.126 ±	0.0105	0.018 ±	0.0011	0.2	120.3 ±	9.50	117.0 ±	6.99	102.8
SO55-18	4.846 ±	0.4407	0.338 ±	0.0256	1.0	1792.9 ±	76.54	1879.0 ±	123.09	95.4
SO55-21	0.103 ±	0.0130	0.016 ±	0.0010	0.4	99.5 ±	11.94	100.4 ±	6.39	99.1
SO55-24	5.416 ±	0.3580	0.352 ±	0.0218	0.2	1887.5 ±	56.65	1942.6 ±	103.92	97.2
SO55-26	0.193 ±	0.0154	0.029 ±	0.0018	0.4	179.3 ±	13.12	185.9 ±	11.03	96.4
SO55-27	0.100 ±	0.0130	0.016 ±	0.0010	0.9	97.0 ±	11.96	101.7 ±	6.50	95.4
SO55-28	0.125 ±	0.0167	0.018 ±	0.0012	0.4	119.2 ±	15.09	117.4 ±	7.63	101.5
SO55-29	0.237 ±	0.0187	0.034 ±	0.0020	0.4	215.6 ±	15.34	215.8 ±	12.68	99.9
SO55-33	0.194 ±	0.0147	0.028 ±	0.0017	0.4	180.3 ±	12.46	177.7 ±	10.38	101.5
SO55-38	0.273 ±	0.0360	0.039 ±	0.0026	0.7	245.1 ±	28.71	246.8 ±	16.42	99.3
SO55-40	0.106 ±	0.0133	0.016 ±	0.0010	0.5	102.5 ±	12.18	101.8 ±	6.45	100.7
SO55-46	0.238 ±	0.0214	0.035 ±	0.0022	0.7	216.7 ±	17.53	223.8 ±	13.47	96.8
SO55-47	0.119 ±	0.0100	0.018 ±	0.0011	0.8	113.9 ±	9.08	114.5 ±	6.80	99.5
SO55-50	0.098 ±	0.0134	0.015 ±	0.0010	0.5	94.7 ±	12.37	95.6 ±	6.19	99.0
SO55-51	0.102 ±	0.0110	0.016 ±	0.0010	0.8	98.8 ±	10.15	100.0 ±	6.16	98.8
SO55-54	0.105 ±	0.0096	0.016 ±	0.0009	0.4	101.4 ±	8.85	99.8 ±	6.00	101.6
ss16-18-5	0.116 ±	0.00315	0.017 ±	0.00033	1.1	111.1 ±	2.87	106.4 ±	2.10	104.4
ss16-18-6	0.131 ±	0.00391	0.019 ±	0.00039	0.5	124.6 ±	3.51	123.4 ±	2.46	100.9
ss16-18-8	0.243 ±	0.00812	0.034 ±	0.00071	0.5	221.3 ±	6.63	218.4 ±	4.40	101.3
ss16-18-13	0.190 ±	0.00594	0.027 ±	0.00055	0.4	176.6 ±	5.07	172.3 ±	3.45	102.5
ss16-18-15	0.308 ±	0.01778	0.042 ±	0.00090	0.6	272.7 ±	13.80	264.1 ±	5.55	103.3
ss16-18-21	0.108 ±	0.00572	0.016 ±	0.00032	0.5	104.1 ±	5.24	100.2 ±	2.05	103.9
ss16-18-22	0.114 ±	0.00685	0.016 ±	0.00036	0.5	109.2 ±	6.24	105.1 ±	2.26	103.9
ss16-18-23	0.121 ±	0.00707	0.018 ±	0.00038	0.4	116.2 ±	6.40	113.3 ±	2.40	102.6
ss16-18-27	0.107 ±	0.00577	0.016 ±	0.00034	0.5	103.5 ±	5.30	104.0 ±	2.13	99.5
Oll-Bt zone (Upper Minawa F.)										
ss16-24-1	0.103 ±	0.00548	0.015 ±	0.00039	0.3	99.1 ±	5.04	96.1 ±	2.45	103.2
ss16-24-5	0.102 ±	0.00422	0.016 ±	0.00038	0.7	98.7 ±	3.89	99.5 ±	2.42	99.1
ss16-24-7	0.101 ±	0.00629	0.015 ±	0.00040	0.9	97.8 ±	5.80	96.0 ±	2.55	101.8
ss16-24-8	0.117 ±	0.00483	0.017 ±	0.00043	0.4	112.7 ±	4.39	111.0 ±	2.69	101.5
ss16-62-3	0.571 ±	0.0184	0.073 ±	0.00169	0.7	458.6 ±	11.89	455.5 ±	10.16	100.7
ss16-62-13	0.267 ±	0.0084	0.037 ±	0.00084	0.6	239.9 ±	6.72	232.3 ±	5.24	103.3
ss16-62-14	5.908 ±	0.1465	0.354 ±	0.00797	0.4	1962.4 ±	21.53	1953.2 ±	37.95	100.5
ss16-62-16	0.114 ±	0.0083	0.017 ±	0.00092	0.5	109.9 ±	7.55	109.6 ±	5.82	100.3
ss16-62-18	0.112 ±	0.0069	0.017 ±	0.00089	0.2	107.7 ±	6.28	107.6 ±	5.64	100.0
ss16-62-22	0.136 ±	0.0082	0.020 ±	0.00104	0.6	129.9 ±	7.31	125.5 ±	6.55	103.5
ss16-62-23	0.136 ±	0.0076	0.020 ±	0.00104	0.5	129.5 ±	6.78	127.0 ±	6.60	102.0
ss16-62-27	0.123 ±	0.0073	0.018 ±	0.00096	0.3	117.9 ±	6.64	116.7 ±	6.09	101.0
Oll-Bt zone (Ojoin F.)										
ss16-63-7	0.106 ±	0.00505	0.015 ±	0.00053	1.2	102.5 ±	4.63	97.7 ±	3.36	104.9
ss16-63-21	12.023 ±	0.24386	0.518 ±	0.00622	0.8	2606.2 ±	19.01	2689.7 ±	26.42	96.9

All errors are quoted at 2σ.