Appendix D

Neutron Activation Analysis Data

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The rock samples and artifacts were ground into powders by Brent Miller at the University of North Carolina at Chapel Hill using an aluminum-oxide shatter box. The samples were then shipped to MURR in powdered form.

Once at MURR, approximately 350 mg aliquots of rock powder were placed in glass vials and oven-dried at 105°C for 24 hours before weighing. Portions weighing 150 mg each were weighed into clean 0.4-dram polyvials used for short irradiations at MURR. At the same time, a sample weighing 200 mg was weighed into the clean high-purity quartz vials used for long irradiations at MURR. Along with the unknown samples, a number of reference standards made from SRM-1633a (coal fly ash) and SRM-688 (basalt rock) were similarly prepared, as were quality control samples (i.e., standards treated as unknowns) made from SRM-278 (obsidian rock) and Ohio Red Clay.

Neutron activation analysis of geological and archaeological samples at MURR, which consists of two irradiations and a total of three gamma counts, constitutes a superset of the procedures used at most other laboratories (Glascock 1992; Neff 1992, 2000). As discussed in detail by Glascock (1992), a short irradiation is carried out through the pneumatic tube irradiation system. Samples in the polyvials are sequentially irradiated, two at a time, for five seconds at a neutron flux of 8 x 10^{13} n/cm^2/s. The 720-second count generally yields gamma spectra containing peaks for nine short-lived elements: aluminum (Al), barium (Ba), calcium (Ca), dysprosium (Dy), potassium (K), manganese (Mn), sodium (Na), titanium (Ti), and vanadium (V). The samples encapsulated in quartz vials are subjected to a 24-hour irradiation at a neutron flux of 5 x 10^{13} n/cm^2/s. This long irradiation is analogous to the single irradiation utilized at most other laboratories. After the long irradiation, samples decay for seven days and then are counted for 1,800 seconds (the "middle count") on a high-resolution germanium detector coupled to an automatic sample changer. The middle count generally yields data for seven medium half-life elements, namely arsenic (As), lanthanum (La), lutetium (Lu), neodymium (Nd), samarium (Sm), uranium (U), and ytterbium (Yb). After an additional three- or four-week decay, a final count of 9,000 seconds is carried out on each sample. The latter measurement usually reports data for 17 long half-life elements, including cerium (Ce), cobalt (Co), chromium (Cr), cesium (Cs), europium (Eu), iron (Fe), hafnium (Hf), nickel (Ni), rubidium (Rb), antimony (Sb), scandium (Sc), strontium (Sr), tantalum (Ta), terbium (Tb), thorium (Th), zinc (Zn), and zirconium (Zr). Ratios of the decay-corrected counts per second per unit weight of the unknowns to the standards are used to calculate concentrations.

The NAA data from the two irradiations and three counts (a total of 33 elements) were tabulated with EXCEL and stored in a dBase file along with the descriptive information available for each sample. Tables D.1-D.2 present the NAA data in parts per million of the element with missing values (i.e., not detected) indicated by the presence of zeroes (i.e., 0.0).

Table D.1. Element Concentrations as Measured by Neutron Activation Analysis (As-Sb).

Sample	As (ppm)	La (ppm)	Lu (ppm)	Nd (ppm)	Sm (ppm)	U (ppm)	Yb (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cs (ppm)	Eu (ppm)	Fe (ppm)	Hf (ppm)	Ni (ppm)	Rb (ppm)	Sb (ppm)
FBL001	0.00	34.2	0.915	29.9	8.00	2.74	6.15	68.6	0.482	0.00	0.673	1.105	10566	5.95	0.00	86.8	0.132
FBL002	0.00	29.5	1.077	28.1	7.66	2.94	7.10	63.3	0.283	0.00	0.559	1.034	8614	6.07	0.00	86.4	0.065
FBL003	0.00	36.5	1.216	29.9	9.44	1.91	8.38	75.9	0.570	0.00	0.633	1.236	12241	6.27	0.00	117.9	0.071
FBL004	1.44	20.8	0.887	20.7	6.23	2.57	6.03	46.4	0.307	0.00	1.275	0.820	8607	6.56	0.00	68.8	0.080
FBL005	18.47	33.9	1.149	35.8	9.54	1.94	7.93	74.9	0.334	0.77	0.989	0.659	8146	5.63	0.00	68.2	0.187
FBL006	0.00	30.8	1.161	27.3	8.17	2.97	7.56	65.7	0.348	0.00	0.369	0.977	10076	6.19	0.00	58.0	0.076
FBL007	0.00	27.5	0.800	21.2	6.37	1.69	5.25	47.9	0.377	0.00	0.773	0.777	7567	5.98	0.00	100.5	0.058
FBL008	1.56	26.4	1.038	29.7	8.04	2.59	7.19	59.5	0.544	0.00	1.054	1.188	12697	7.03	0.00	79.7	0.528
FBL009	0.00	24.9	0.970	23.8	7.58	2.22	6.61	55.7	0.571	0.00	2.139	1.149	13058	6.51	0.00	92.6	0.657
FBL010	0.77	23.9	1.071	19.6	7.42	2.54	6.97	54.0	0.626	0.00	0.730	0.997	12273	6.63	0.00	58.0	0.156
FBL011	0.00	26.1	1.029	22.8	7.73	2.39	7.01	57.8	0.811	0.00	0.883	0.989	12664	7.01	0.00	82.8	0.136
FBL012	1.94	27.5	1.069	26.3	8.24	2.36	7.16	61.0	0.733	0.00	0.807	1.130	13598	7.33	0.00	71.4	0.192
FBL013	0.00	22.8	0.965	24.4	6.43	1.67	6.14	51.3	0.644	0.00	0.489	0.970	13255	6.81	22.76	33.7	0.119
FBL014	0.00	24.1	0.779	24.5	6.86	1.84	5.29	52.2	0.575	0.00	1.587	1.559	15659	5.76	0.00	91.2	0.186
FBL015	0.00	28.3	0.804	21.9	6.39	3.32	5.60	60.6	0.299	0.00	0.508	0.823	9632	5.59	0.00	65.8	0.135
FBL016	0.00	26.1	0.928	23.3	6.58	3.87	6.22	56.0	0.314	0.00	0.656	0.782	9873	5.18	0.00	125.6	0.095
FBL017	0.00	27.6	0.861	23.2	6.67	3.08	6.22	59.8	0.377	0.00	0.594	0.825	9023	5.47	0.00	87.3	0.166
FBL018	0.00	25.8	0.894	25.9	6.01	2.86	5.89	54.6	0.345	0.00	0.555	0.727	9459	5.04	0.00	93.8	0.127
FBL019	0.00	26.6	0.833	23.7	6.71	2.26	5.62	57.4	0.256	0.00	0.474	0.807	9760	5.24	0.00	67.5	0.120
FBL020	0.00	18.5	0.473	15.7	4.32	1.04	3.16	37.9	3.372	5.48	2.859	0.855	16609	4.00	0.00	59.2	0.212
FBL021	6.54	17.6	0.711	16.7	5.05	0.83	4.61	37.7	0.426	0.00	0.589	1.115	8288	4.94	0.00	53.4	0.143
FBL022	2.36	19.6	0.733	21.9	5.63	0.83	4.79	42.5	0.571	0.00	0.384	1.170	9823	4.73	0.00	37.9	0.030
FBL023	0.00	16.3	0.557	17.2	4.21	1.06	3.63	33.0	0.574	0.00	0.145	0.855	11136	3.80	0.00	25.1	0.090
FBL024	0.00	17.7	0.530	18.6	5.10	1.39	3.47	39.0	1.826	0.00	0.669	0.974	15647	4.11	0.00	14.0	0.272
FBL025	0.00	28.2	0.636	19.0	5.58	2.27	4.27	59.0	0.362	0.65	0.933	0.685	6959	3.70	0.00	94.8	0.159
FBL026	0.00	28.0	0.613	25.1	5.47	1.30	4.29	58.0	0.413	0.00	1.381	0.728	7783	3.82	0.00	93.8	0.311
FBL027	15.27	16.5	0.586	22.5	6.55	2.78	4.22	55.6	0.780	2.56	2.394	1.185	7240	4.02	0.00	142.1	0.900
FBL028	0.00	44.0	0.528	46.3	9.00	3.98	4.06	92.9	2.105	3.90	4.750	1.637	15541	5.81	0.00	342.0	0.235
FBL029	0.00	35.4	0.557	38.7	7.32	2.46	4.31	76.6	2.933	11.46	2.404	1.383	14319	4.65	0.00	161.6	0.278

Table D.1. Element Concentrations as Measured by Neutron Activation Analysis (As-Sb) (continued).

Sample	As (ppm)	La (ppm)	Lu (ppm)	Nd (ppm)	Sm (ppm)	U (ppm)	Yb (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cs (ppm)	Eu (ppm)	Fe (ppm)	Hf (ppm)	Ni (ppm)	Rb (ppm)	Sb (ppm)
FBL030	0.00	100.6	0.794	89.2	17.67	2.64	6.25	148.0	2.735	6.09	1.705	3.216	14813	6.51	0.00	60.4	0.260
FBL031	3.94	55.3	1.172	65.1	12.37	4.35	7.95	124.3	0.551	1.85	0.593	0.495	20571	14.47	0.00	125.5	0.549
FBL032	2.69	53.0	1.135	59.0	12.43	3.83	8.10	123.1	0.381	1.87	0.372	0.370	19301	14.35	0.00	86.5	0.546
FBL033	0.00	60.5	1.217	64.9	12.97	4.34	8.31	130.8	0.333	1.00	0.352	0.379	19342	15.00	0.00	115.6	0.221
FBL034	0.00	56.6	1.191	63.5	13.93	3.80	8.11	124.6	0.452	1.88	0.372	0.481	18815	14.34	0.00	111.2	0.634
FBL035	5.61	20.9	0.380	18.4	5.34	1.53	2.78	46.5	9.781	21.43	1.663	1.231	39870	4.75	0.00	59.2	0.211
FBL036	2.67	24.7	0.394	18.1	4.76	4.38	2.88	51.7	4.205	2.82	0.541	0.769	21699	7.00	0.00	37.7	0.311
FBL037	14.13	32.8	0.485	35.9	6.82	2.65	3.15	67.8	13.137	19.73	1.699	1.350	39828	5.13	0.00	114.0	0.407
FBL038	11.28	17.6	0.234	19.0	4.28	0.00	1.42	33.5	22.908	5.28	3.683	1.118	58740	2.46	0.00	68.3	0.192
FBL039	0.00	12.8	0.695	16.2	4.23	1.47	4.93	33.9	0.283	0.00	0.220	0.482	3876	6.80	0.00	88.8	0.159
FBL040	0.00	10.4	0.357	13.5	5.44	0.00	2.60	25.3	24.188	0.00	0.430	1.754	86274	2.10	0.00	0.0	0.085
FBL041	0.00	10.3	0.290	14.6	4.40	0.00	1.88	25.5	9.059	0.00	0.711	1.297	55005	1.73	0.00	34.3	0.136
FBL042	10.84	7.2	0.273	7.4	2.68	0.00	1.86	14.9	28.417	113.54	1.455	0.856	71010	1.60	0.00	33.2	1.455
FBL043	10.09	38.1	0.495	28.0	6.68	4.57	3.08	69.8	4.056	0.00	0.928	1.552	29253	6.01	0.00	20.0	0.460
FBL044	0.00	23.8	0.680	34.7	8.30	2.17	4.36	61.0	2.238	2.27	0.748	1.718	16551	5.85	0.00	21.8	0.319
FBL045	13.92	28.2	0.405	26.9	5.43	3.91	2.68	57.0	3.559	0.00	0.882	1.174	24916	5.24	0.00	27.9	0.448
FBL046	6.18	19.5	0.306	20.7	4.15	1.81	1.89	40.1	7.905	5.75	0.283	0.946	29026	3.67	0.00	12.6	0.452
FBL047	0.00	19.3	0.389	14.5	4.05	0.00	2.58	41.8	3.386	2.21	0.334	0.838	17432	4.89	21.22	11.7	0.266
FBL048	3.16	26.1	0.501	29.9	5.64	1.21	3.25	57.2	6.411	3.37	0.000	1.186	22284	6.23	0.00	0.0	0.528
FBL049	0.00	26.4	0.438	28.5	5.32	1.43	3.04	57.1	3.228	2.05	0.312	1.053	18595	6.33	0.00	14.4	0.173
FBL050	2.74	26.0	0.464	38.0	5.34	1.59	3.04	56.0	3.032	2.54	0.192	1.034	17739	5.83	0.00	9.2	0.395
FBL051	0.00	22.5	0.467	19.5	3.83	2.27	3.03	44.7	0.314	0.73	0.827	0.599	6808	3.55	0.00	90.9	0.109
FBL052	0.00	19.2	0.343	17.4	2.97	1.44	2.26	37.0	0.176	0.00	0.766	0.456	4486	2.71	0.00	69.5	0.173
FBL053	0.00	24.2	0.502	21.6	4.16	2.06	3.23	48.3	0.380	0.00	0.714	0.741	7596	3.98	0.00	88.7	0.155
FBL054	0.55	21.3	0.447	21.4	3.87	1.80	3.03	42.3	0.398	0.00	0.804	0.605	7339	3.71	0.00	98.5	0.108
FBL055	0.00	17.3	0.381	23.7	4.23	1.11	2.69	36.9	1.845	0.00	0.571	1.005	10273	3.31	0.00	37.9	0.121
FBL056	1.75	18.9	0.492	20.3	4.16	3.14	2.96	41.3	2.589	3.74	2.462	0.726	8292	3.74	0.00	200.4	0.206
FBL057	0.00	45.6	1.206	47.3	8.67	3.82	8.32	92.5	2.398	2.67	1.084	1.444	8760	5.54	0.00	92.3	0.125
FBL058	6.28	57.9	1.151	73.0	12.83	3.56	8.16	129.7	0.860	1.24	0.376	0.409	17963	15.30	0.00	105.4	0.622

Table D.1. Element Concentrations as Measured by Neutron Activation Analysis (As-Sb) (continued).

Sample	As (ppm)	La (ppm)	Lu (ppm)	Nd (ppm)	Sm (ppm)	U (ppm)	Yb (ppm)	Ce (ppm)	Co (ppm)	Cr (ppm)	Cs (ppm)	Eu (ppm)	Fe (ppm)	Hf (ppm)	Ni (ppm)	Rb (ppm)	Sb (ppm)
FBL059	1.97	48.8	1.046	114.4	11.85	4.81	7.34	112.4	1.630	2.66	0.604	0.446	18053	14.08	0.00	151.0	0.366
FBL060	2.53	25.5	0.596	28.5	5.97	2.49	4.02	58.4	0.683	4.38	0.766	0.554	8236	4.99	0.00	84.1	0.265
FBL061	3.66	26.8	0.657	31.7	6.12	2.88	4.31	58.4	0.917	1.74	0.862	0.626	9315	5.13	0.00	89.4	0.385
FBL062	3.58	26.5	0.601	33.8	6.10	2.71	4.26	56.1	0.836	6.43	0.729	0.596	8333	4.93	0.00	83.1	0.294
FBL063	3.56	28.4	0.668	33.6	6.44	2.55	4.68	63.0	0.523	35.42	1.142	0.536	7721	5.00	0.00	87.7	0.208
FBL064	1.79	27.3	0.654	30.6	6.28	3.07	4.44	59.7	0.456	2.82	1.156	0.531	8252	5.05	0.00	89.2	0.408
FBL065	1.84	31.9	0.790	41.7	7.58	2.64	5.31	71.7	0.602	10.40	1.149	0.651	8734	5.19	0.00	81.7	0.284
FBL066	0.00	25.2	0.461	27.1	4.81	1.58	2.99	54.3	3.642	3.07	0.159	1.014	18253	6.29	0.00	5.2	0.216
FBL067	9.17	22.8	0.424	27.8	5.17	1.15	2.80	48.2	10.474	12.86	0.345	1.491	33733	4.55	0.00	14.5	0.411
FBL068	3.66	30.2	0.707	47.0	6.89	2.11	4.52	69.6	1.598	2.64	0.322	1.478	10444	6.58	0.00	6.8	0.326
FBL069	13.86	17.2	0.448	23.9	4.76	4.37	2.53	44.1	21.915	204.81	1.997	1.280	71816	3.56	79.67	48.5	0.657
FBL070	0.00	7.5	0.123	17.1	2.53	0.00	0.96	18.0	35.801	42.69	0.526	0.983	76532	1.27	0.00	10.4	0.139
FBL071	2.49	6.5	0.203	10.1	2.37	0.00	1.34	14.2	26.717	64.96	0.757	0.927	72599	0.93	0.00	17.4	0.169
FBL072	0.00	26.2	0.891	31.4	6.98	1.53	6.25	56.5	0.169	0.91	0.389	1.339	13005	6.55	0.00	52.8	0.132
FBL073	0.00	26.9	0.905	40.8	9.30	1.92	6.07	55.1	0.064	3.32	0.480	2.160	7083	7.63	0.00	41.8	0.196
FBL074	0.00	28.2	0.569	30.6	5.77	2.93	3.80	59.4	0.364	3.58	0.858	1.083	11402	6.12	0.00	100.6	0.324
FBL075	0.00	14.8	0.448	31.1	5.15	0.00	2.89	34.8	4.703	2.32	0.619	1.592	37429	3.77	0.00	35.8	0.109
FBL076	0.00	24.1	0.613	20.9	5.12	1.76	4.24	51.1	0.948	2.56	0.501	1.048	12233	5.49	0.00	42.7	0.165
FBL077	0.00	21.8	0.535	21.8	4.70	2.16	3.65	45.4	0.487	1.27	0.334	0.874	8658	5.04	0.00	31.6	0.079
FBL078	1.94	25.2	0.585	26.9	5.48	2.63	4.10	54.4	1.454	2.13	1.396	1.154	16125	7.84	0.00	59.9	0.358
FBL079	0.00	23.6	0.724	27.3	5.93	2.10	4.63	51.2	0.454	5.08	0.749	1.456	14377	6.10	0.00	113.8	0.348
FBL080	0.00	24.5	0.842	30.9	6.69	1.39	5.74	53.6	0.087	0.00	0.467	1.179	10949	6.18	0.00	57.0	0.172

Table D.2. Element Concentrations as Measured by Neutron Activation Analysis (Sc-V).

Sample	Sc (ppm)	Sr (ppm)	Ta (ppm)	Tb (ppm)	Th (ppm)	Zn (ppm)	Zr (ppm)	Al (ppm)	Ba (ppm)	Ca (ppm)	Dy (ppm)	K (ppm)	Mn (ppm)	Na (ppm)	Ti (ppm)	V (ppm)
FBL001	5.06	65.7	0.668	1.246	9.43	33.6	136.6	59100	489	6549	7.15	24508	457	25157	512	0.0
FBL002	5.27	0.0	0.675	1.273	9.72	47.5	135.4	59308	525	2932	7.65	24150	261	28468	525	0.0
FBL003	5.71	44.7	0.680	1.655	9.91	68.5	123.2	55545	678	3104	9.53	27509	520	22641	0	0.0
FBL004	4.25	0.0	0.704	1.119	10.36	10.6	121.6	57835	423	1550	6.65	16164	231	31515	840	0.0
FBL005	5.22	0.0	0.681	1.531	11.81	47.8	116.7	56623	539	1759	9.32	21535	121	28626	697	0.0
FBL006	5.36	71.5	0.672	1.367	9.84	47.3	130.1	56734	494	2583	7.94	17156	391	29613	388	0.0
FBL007	3.99	38.0	0.629	0.945	9.35	32.4	132.2	57026	597	1611	5.21	30127	231	22069	250	0.0
FBL008	7.86	0.0	0.544	1.494	8.79	53.3	164.6	52836	407	4680	8.01	20215	267	24118	963	0.0
FBL009	7.44	75.3	0.557	1.312	8.43	53.0	146.5	53169	400	3246	7.91	24900	383	22277	611	0.0
FBL010	6.30	0.0	0.542	1.376	8.60	55.9	152.8	50935	401	2992	7.84	15226	375	25496	621	0.0
FBL011	7.42	67.0	0.607	1.307	9.66	29.8	171.1	53158	431	3952	7.77	23540	276	26848	742	0.0
FBL012	8.01	0.0	0.642	1.402	10.08	25.9	165.8	58339	445	4210	8.37	18128	257	29628	811	0.0
FBL013	7.29	0.0	0.552	1.253	8.52	28.3	144.3	49152	160	1155	7.04	10094	361	30491	543	0.0
FBL014	10.75	136.0	0.476	1.066	6.86	68.4	140.7	57970	434	6927	5.65	20241	598	25771	1628	0.0
FBL015	6.67	57.2	0.690	1.042	11.36	29.7	123.2	58537	539	2195	6.07	19271	366	27518	405	0.0
FBL016	6.14	36.5	0.641	1.103	10.53	44.9	109.0	54460	577	1490	6.64	26182	419	24297	488	0.0
FBL017	6.75	40.0	0.685	1.121	11.07	39.4	109.2	57168	618	3905	6.61	23203	342	26253	227	0.0
FBL018	6.05	53.6	0.638	1.043	10.26	32.2	94.6	56790	489	4165	6.15	22677	319	26344	604	0.0
FBL019	6.46	51.6	0.651	1.090	10.67	41.3	130.0	52519	410	2801	5.89	17043	391	27528	362	0.0
FBL020	9.66	213.7	0.349	0.732	4.96	44.7	103.3	60464	365	14304	3.53	14289	508	18753	1564	16.1
FBL021	5.83	176.8	0.176	0.837	3.94	38.7	116.0	52405	452	4946	4.11	17888	549	25923	1068	0.0
FBL022	4.25	167.4	0.222	0.849	3.92	29.1	148.9	50454	346	7386	4.12	13015	669	26230	821	0.0
FBL023	6.70	89.2	0.231	0.620	3.83	17.0	87.9	54050	363	8840	4.16	12607	657	28949	812	0.0
FBL024	10.45	196.7	0.314	0.781	4.46	56.8	102.9	62021	184	15773	4.30	7032	717	31059	1051	15.3
FBL025	4.18	25.4	0.645	0.804	8.99	22.1	99.3	62386	770	1806	5.23	33986	290	28354	465	0.0
FBL026	4.24	38.3	0.618	0.757	9.12	44.3	83.7	65645	671	3486	5.43	31839	322	29353	0	0.0
FBL027	5.26	72.8	0.832	0.946	11.65	27.5	111.1	51989	914	3689	6.52	37353	168	12784	585	7.8
FBL028	7.80	105.1	1.196	1.171	16.12	61.9	133.7	70548	2227	4989	7.15	71471	770	5014	1690	18.7
FBL029	8.47	346.2	0.870	0.965	12.00	62.3	143.5	56465	655	5369	6.05	38205	795	14478	1307	29.4

Table D.2. Element Concentrations as Measured by Neutron Activation Analysis (Sc-V) (continued).

Sample	Sc (ppm)	Sr (ppm)	Ta (ppm)	Tb (ppm)	Th (ppm)	Zn (ppm)	Zr (ppm)	Al (ppm)	Ba (ppm)	Ca (ppm)	Dy (ppm)	K (ppm)	Mn (ppm)	Na (ppm)	Ti (ppm)	V (ppm)
FBL030	8.01	405.1	1.046	2.374	15.12	57.6	201.7	66402	353	12323	13.31	11410	768	31596	699	21.7
FBL031	2.27	75.0	1.320	1.858	12.85	60.4	361.8	57578	0	3071	11.39	35505	412	24096	1131	0.0
FBL032	1.49	116.1	1.275	1.732	12.33	37.7	334.0	63252	60	5624	11.19	26501	399	31046	0	0.0
FBL033	1.23	71.2	1.360	1.874	13.16	89.4	356.9	59389	0	1845	11.65	32870	279	29276	874	0.0
FBL034	2.02	82.8	1.329	1.897	12.81	64.9	336.4	63136	0	4927	12.10	32981	544	29146	879	6.1
FBL035	14.02	188.2	0.417	0.660	5.73	92.8	132.7	83851	1131	13888	4.02	25179	1014	22975	3238	89.0
FBL036	7.51	56.3	0.436	0.542	7.73	42.0	182.7	75278	828	4024	2.80	28334	334	38000	1971	26.5
FBL037	14.66	495.0	0.431	0.750	6.76	71.2	112.3	74748	1279	35134	4.59	35925	873	8300	3582	101.2
FBL038	19.34	251.7	0.164	0.499	1.56	86.7	73.3	87090	1328	13871	2.38	31143	1341	35286	3463	179.2
FBL039	4.60	64.9	0.683	0.759	10.17	19.1	134.5	63978	320	0	6.10	37453	40	27030	727	0.0
FBL040	34.94	409.4	0.000	0.938	0.42	146.8	0.0	82900	256	48585	4.25	818	1776	25652	7918	243.7
FBL041	9.55	340.5	0.077	0.500	0.44	75.4	28.4	94277	273	10340	2.47	11139	1274	44556	3477	24.6
FBL042	34.18	365.1	0.000	0.597	0.38	91.0	0.0	89104	280	58865	2.36	12309	1922	23959	3661	259.6
FBL043	9.99	682.0	0.395	0.740	9.22	81.3	169.5	83047	515	16354	4.18	9596	749	43278	2716	27.4
FBL044	8.03	189.2	0.491	1.070	5.73	73.6	156.9	64209	110	2480	6.50	5211	566	38521	1367	20.6
FBL045	8.72	669.9	0.301	0.605	8.02	55.5	145.4	73416	592	8826	3.21	8887	651	39301	2141	0.0
FBL046	9.73	316.2	0.230	0.569	4.56	65.5	91.8	51954	305	8433	2.53	9222	599	26434	2498	65.3
FBL047	5.93	238.4	0.301	0.476	2.71	48.1	143.0	66960	520	8315	2.79	11351	730	36839	1225	21.4
FBL048	8.36	443.2	0.344	0.666	3.42	56.7	142.7	78294	0	13242	3.67	0	638	49802	2042	27.8
FBL049	7.00	296.1	0.356	0.583	3.47	48.6	166.1	75135	403	9211	3.78	9174	653	41342	1735	16.1
FBL050	6.95	448.8	0.319	0.602	3.25	35.9	144.9	72955	282	18885	3.45	5310	697	40445	2055	21.8
FBL051	3.85	41.2	0.499	0.672	7.56	31.9	66.9	53794	552	1172	3.91	28770	214	24816	653	0.0
FBL052	3.08	39.7	0.394	0.522	5.54	32.1	62.5	38510	427	936	3.13	22129	208	14578	563	0.0
FBL053	4.38	30.6	0.586	0.724	8.40	35.7	91.7	63095	645	0	4.29	32483	259	27398	0	0.0
FBL054	4.03	43.6	0.511	0.748	7.81	36.1	82.5	50377	651	886	3.85	34205	231	17440	1153	0.0
FBL055	9.30	74.1	0.320	0.689	4.07	54.4	98.2	64480	329	5957	3.79	16361	528	33681	1090	0.0
FBL056	7.23	55.7	0.586	0.598	7.14	54.6	87.3	48259	832	2631	3.28	50612	296	4461	1688	17.7
FBL057	6.67	83.9	1.108	1.392	14.48	32.4	143.7	70645	713	3767	8.31	31451	430	32691	395	0.0
FBL058	1.43	98.9	1.441	2.121	13.36	96.3	360.9	61579	0	4179	11.52	36008	461	27084	770	0.0

Table D.2. Element Concentrations as Measured by Neutron Activation Analysis (Sc-V) (continued).

Sample	Sc (ppm)	Sr (ppm)	Ta (ppm)	Tb (ppm)	Th (ppm)	Zn (ppm)	Zr (ppm)	Al (ppm)	Ba (ppm)	Ca (ppm)	Dy (ppm)	K (ppm)	Mn (ppm)	Na (ppm)	Ti (ppm)	V (ppm)
FBL059	1.79	119.0	1.329	1.983	12.18	113.5	330.8	62459	0	5471	11.60	47395	380	19168	1228	17.0
FBL060	4.81	74.5	0.631	1.024	7.34	38.8	102.4	65927	696	4689	5.65	26954	315	29242	0	0.0
FBL061	5.59	71.1	0.632	1.086	7.39	38.7	109.2	66979	575	5697	6.18	29384	308	28648	857	0.0
FBL062	5.08	77.7	0.622	0.999	7.40	30.4	100.6	66395	666	5187	5.63	29862	254	28313	545	0.0
FBL063	5.09	50.3	0.654	1.114	7.70	21.1	96.2	60983	703	4469	7.08	31500	155	27046	871	0.0
FBL064	5.32	27.9	0.642	1.087	7.69	38.4	100.1	61265	725	5009	6.54	33868	332	22503	753	0.0
FBL065	5.98	72.6	0.690	1.286	8.18	33.0	113.2	67536	800	4124	7.17	32105	213	29063	0	0.0
FBL066	7.55	199.7	0.370	0.646	3.46	61.4	146.8	73194	109	7413	3.29	5006	689	47941	1553	20.5
FBL067	13.23	304.1	0.260	0.712	2.36	74.3	97.9	88249	255	26574	3.76	7980	1090	40746	3762	85.9
FBL068	5.92	199.7	0.627	1.038	6.54	39.7	167.3	57826	68	6300	6.03	2287	294	37734	1292	21.7
FBL069	34.80	187.5	0.448	0.714	3.88	266.4	102.0	67095	611	6374	3.39	25529	473	34699	2261	25.3
FBL070	26.10	821.4	0.000	0.231	1.17	98.4	0.0	96748	0	66052	1.07	2287	1776	16410	5064	289.2
FBL071	29.88	519.4	0.000	0.395	0.20	92.5	0.0	97330	174	70819	1.83	7767	1192	15144	4543	284.8
FBL072	8.56	82.7	0.574	1.425	6.76	34.4	162.8	63172	418	2782	8.04	13349	616	35648	403	0.0
FBL073	8.60	189.8	0.366	1.702	5.59	26.2	181.9	67261	529	7818	9.70	21093	518	34937	1034	0.0
FBL074	8.42	102.6	0.779	0.911	9.18	43.8	167.8	65232	569	9864	5.34	27843	339	28020	699	0.0
FBL075	17.61	410.2	0.219	0.808	2.33	98.8	93.5	76656	275	29474	4.05	13916	1329	31086	5166	62.0
FBL076	7.77	108.9	0.597	0.887	7.65	53.6	128.9	58324	422	0	5.04	17291	685	33849	1138	0.0
FBL077	6.78	59.6	0.571	0.841	7.28	45.0	115.6	60946	381	850	4.69	16837	309	35927	516	0.0
FBL078	8.76	104.7	0.750	0.943	8.98	48.7	219.7	67281	385	9685	5.42	20888	488	32147	1492	0.0
FBL079	9.71	187.8	0.623	1.233	7.22	20.0	157.7	72850	682	11852	5.93	35191	825	26406	868	0.0
FBL080	8.04	141.2	0.557	1.379	6.36	49.1	138.3	66680	517	14391	7.95	18451	611	28134	0	0.0