



Date Submitted: 14-Dec-17
Invoice No.: A17-14248
Invoice Date: 22-Jan-18
Your Reference: 3000652419

Geological Survey of Canada
475-601 BOOTH ST
OTTAWA ON K1A0E8
Canada

ATTN: Alex Zagorevski

CERTIFICATE OF ANALYSIS

128 Rock samples were submitted for analysis.

The following analytical package(s) were requested:

Code 4LITHORES (11+) Major Elements Fusion ICP(WRA)/Trace Elements Fusion ICP/MS(WRA4B2)

REPORT **A17-14248**

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Notes:

We recommend using option 4B1 for accurate levels of the base metals Cu, Pb, Zn, Ni and Ag. Option 4B-INAA for As, Sb, high W >100ppm, Cr >1000ppm and Sn >50ppm by Code 5D. Values for these elements provided by Fusion ICP/MS, are order of magnitude only and are provided for general information. Mineralized samples should have the Quant option selected or request assays for values which exceed the range of option 4B1. Total includes all elements in % oxide to the left of total. Zr is now being reported from FUS-ICP instead of FUS-MS.

CERTIFIED BY:

A handwritten signature in black ink, appearing to be "Emmanuel Esemé". The signature is written in a cursive, somewhat stylized font.

Emmanuel Esemé , Ph.D.
Quality Control

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Results

Activation Laboratories Ltd.

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Analyte Symbol	SiO2	Al2O3	Fe2O3(T)	MnO	MgO	CaO	Na2O	K2O	TiO2	P2O5	LOI	Total	Sc	Be	V	Cr	Co	Ni	Cu	Zn	Ga	Ge	As
Unit Symbol	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.01	0.01	0.01	0.001	0.01	0.01	0.01	0.01	0.001	0.01		0.01	1	1	5	20	1	20	10	30	1	0.5	5
Method Code	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
17RAY-MC 051a2	44.78	15.46	10.03	0.158	9.10	9.12	2.62	0.70	2.314	0.34	4.36	98.99	33	1	310	440	49	140	110	80	19	1.5	< 5
17RAY-MC 051b1	49.20	15.31	12.59	0.102	6.27	8.74	0.56	1.29	1.806	0.08	3.90	99.86	17	1	39	70	31	130	< 10	60	21	1.8	< 5
17RAY-MC 055c3	46.58	15.50	10.02	0.153	10.23	6.71	3.81	0.25	1.044	0.14	5.65	100.1	37	< 1	205	680	57	210	80	70	13	1.5	< 5
17RAY-MC 055d1	95.05	0.83	1.04	0.013	0.22	0.52	0.10	0.16	0.043	< 0.01	0.59	98.56	1	< 1	11	240	2	< 20	< 10	< 30	2	0.6	< 5
17RAY-MC 062a1	43.57	14.93	9.73	0.152	8.74	11.45	2.16	0.02	3.029	0.71	4.59	99.09	31	2	285	250	43	110	30	100	18	1.5	< 5
17RAY-MC 066a1	15.39	12.53	13.01	0.118	1.80	27.98	1.37	0.75	2.950	0.55	23.28	99.74	21	3	217	130	31	50	< 10	90	19	1.1	< 5
17RAY-MC 066b1	39.99	17.20	9.25	0.157	3.95	10.48	1.01	2.35	2.497	1.04	10.87	98.82	17	3	170	80	32	30	< 10	90	21	1.0	< 5
17RAY-MC 073b1	68.34	14.55	1.78	0.039	0.77	3.56	3.97	2.22	0.279	0.10	3.82	99.43	3	1	26	< 20	3	< 20	10	50	19	1.0	< 5
17RAY-MC 073c1	48.64	14.49	10.74	0.170	8.09	10.59	2.70	0.06	1.170	0.10	3.35	100.1	38	< 1	280	290	41	150	60	80	15	1.5	< 5
17RAY-MC 073c2	47.65	14.02	11.47	0.175	8.73	10.15	2.62	0.05	1.233	0.11	3.71	99.92	40	< 1	294	280	43	100	70	150	15	1.4	< 5
17RAY-MC 074c1	67.72	14.77	1.76	0.030	0.60	3.62	4.52	1.11	0.196	0.07	4.27	98.67	3	1	24	60	3	< 20	< 10	30	16	1.0	< 5
17RAY-MC 075a1	92.12	2.32	2.13	0.025	0.22	0.50	0.05	0.69	0.083	< 0.01	1.08	99.20	3	< 1	18	160	5	< 20	50	< 30	5	1.0	< 5
17RAY-MC 081b1	50.78	10.87	6.79	0.080	8.68	8.78	0.20	0.18	0.549	0.10	11.52	98.54	27	< 1	166	540	31	40	30	70	13	0.9	< 5
17RAY-MC 082a2	40.55	14.62	10.27	0.074	7.29	9.59	0.10	2.34	2.592	0.77	11.50	99.68	19	3	180	110	28	70	< 10	70	22	1.3	< 5
17RAY-MC 082b1	14.62	5.89	5.95	0.127	2.67	37.01	0.04	0.37	1.012	0.34	31.04	99.08	7	1	69	40	12	20	20	40	10	< 0.5	< 5
17RAY-MC 094a1	44.56	8.71	10.89	0.173	19.27	10.94	0.17	0.02	0.296	< 0.01	4.66	99.69	39	< 1	164	970	83	590	180	60	8	1.2	< 5
17RAY-MC 094b1	50.43	14.02	6.09	0.119	10.69	14.86	1.89	0.05	0.248	< 0.01	1.94	100.3	34	< 1	135	640	38	200	50	40	9	1.4	< 5
17RAY-MC 095a1	44.90	7.86	10.63	0.185	18.61	12.54	0.23	0.01	0.297	< 0.01	3.53	98.78	44	< 1	180	1040	69	470	110	60	8	1.3	< 5
17RAY-MC 096a1	86.53	5.47	2.69	0.021	1.14	0.21	0.73	1.02	0.295	0.07	1.16	99.34	8	1	38	100	6	30	10	60	10	1.6	< 5
17RAY-MC 096b1	68.19	14.56	1.66	0.021	0.70	3.60	3.66	2.30	0.219	0.08	3.74	98.72	3	1	25	40	2	< 20	< 10	110	18	0.9	< 5
17RAY-MC 097b1	67.51	1.27	0.69	0.013	0.27	16.49	0.03	0.31	0.056	0.32	13.03	99.98	3	< 1	38	60	< 1	< 20	10	40	3	< 0.5	< 5
17RAY-MC 098a1	44.39	21.20	6.16	0.108	8.99	11.66	0.29	2.93	0.288	< 0.01	4.26	100.3	50	< 1	106	120	41	100	40	30	14	1.5	< 5
17RAY-MC 099b1	62.01	16.35	3.77	0.073	3.07	5.90	4.87	0.42	0.345	0.17	1.65	98.62	8	< 1	77	70	8	< 20	30	< 30	15	1.5	< 5
17RAY-MC 101b2	41.55	20.16	8.27	0.121	10.15	14.54	0.73	0.04	0.321	< 0.01	4.24	100.1	34	< 1	188	40	45	70	< 10	60	14	1.6	< 5
17RAY-MC 103a1	61.73	16.20	5.79	0.114	2.55	5.87	4.18	0.10	0.432	0.16	2.34	99.45	9	< 1	117	30	2	< 20	< 10	50	16	1.3	< 5
17RAY-MC 103b1	65.60	16.74	3.09	0.065	1.77	2.37	6.26	0.58	0.331	0.14	1.72	98.66	6	< 1	69	40	2	< 20	< 10	60	16	0.8	< 5
17RAY-MC 103c1	50.47	20.77	5.24	0.116	5.89	11.13	3.02	0.36	0.195	0.05	3.30	100.5	9	< 1	60	< 20	21	50	30	40	16	1.8	< 5
17RAY-MC 105a1	40.26	17.11	5.61	0.126	5.95	17.50	1.61	0.11	0.302	0.02	11.14	99.74	45	< 1	125	70	20	50	< 10	30	16	2.7	< 5
17RAY-MC 105b1	66.65	16.42	3.02	0.060	1.30	3.61	5.26	0.58	0.266	0.12	1.55	98.83	3	< 1	39	40	5	< 20	< 10	< 30	17	1.6	< 5
17RAY-MC 109a1	41.56	15.55	12.76	0.208	9.33	13.71	0.43	0.16	0.823	< 0.01	4.68	99.22	62	< 1	517	110	45	60	< 10	80	17	1.9	< 5
17RAY-MC 112b2	49.72	16.48	8.00	0.161	4.74	10.67	3.95	1.16	0.892	0.22	2.58	98.57	26	< 1	244	70	24	30	110	80	17	2.8	< 5
17RAY-MC 113a1	44.01	15.91	11.65	0.168	9.54	8.22	2.46	1.31	0.979	0.25	5.36	99.86	52	< 1	392	280	44	130	110	120	16	1.5	< 5
17RAY-MC 119a1	35.66	0.25	11.94	0.208	43.39	0.79	0.03	< 0.01	0.016	< 0.01	7.29	99.56	6	< 1	10	2050	148	890	< 10	70	< 1	1.2	< 5
17RAY-MC 123a	46.60	13.69	11.28	0.188	8.63	10.74	3.12	0.86	1.041	0.19	3.62	99.96	48	< 1	352	210	44	60	90	80	17	1.6	< 5
17RAY-MC 124a	49.68	17.57	10.80	0.169	6.60	3.42	4.26	1.91	0.883	0.28	3.61	99.18	37	< 1	366	30	33	< 20	140	90	13	0.7	< 5
17RAY-MC 124b	50.31	16.61	9.36	0.178	5.48	7.30	3.87	1.75	1.029	0.27	3.06	99.20	27	< 1	275	60	29	< 20	130	90	17	1.5	< 5
17RAY-MC 125a	47.92	13.72	7.99	0.140	4.77	12.40	3.14	1.35	0.732	0.26	6.99	99.40	27	< 1	248	60	23	< 20	90	90	15	1.4	< 5
17RAY-MC 125d	47.25	15.49	10.51	0.172	8.28	7.00	2.61	2.47	1.072	0.20	3.59	98.64	38	< 1	317	140	41	50	100	80	16	1.8	< 5
17RAY-MC 126a	44.73	11.94	9.36	0.185	17.71	7.95	1.16	0.83	0.645	0.15	5.36	100.0	35	< 1	232	1470	58	610	110	70	13	1.6	5
17RAY-MC 129a	47.27	15.57	10.19	0.215	5.41	9.57	2.09	2.73	0.867	0.26	4.62	98.78	30	< 1	319	90	33	30	120	80	17	1.4	< 5
17RAY-MC 132d	47.16	1.43	7.86	0.149	23.52	15.39	0.14	0.01	0.136	< 0.01	4.18	99.99	62	< 1	55	1780	78	330	< 10	40	3	2.5	< 5

Results

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Analyte Symbol	SiO2	Al2O3	Fe2O3(T)	MnO	MgO	CaO	Na2O	K2O	TiO2	P2O5	LOI	Total	Sc	Be	V	Cr	Co	Ni	Cu	Zn	Ga	Ge	As
Unit Symbol	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.01	0.01	0.01	0.001	0.01	0.01	0.01	0.01	0.001	0.01		0.01	1	1	5	20	1	20	10	30	1	0.5	5
Method Code	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
17RAY-MC 133a	37.65	0.26	10.83	0.179	41.49	0.19	0.03	0.01	0.012	< 0.01	9.33	99.98	4	< 1	5	3740	149	1060	< 10	70	< 1	0.8	< 5
17RAY-MC 135b	51.64	1.65	5.42	0.128	18.20	21.43	0.20	0.01	0.150	< 0.01	0.89	99.71	74	< 1	52	2140	43	160	< 10	< 30	3	2.4	< 5
17RAY-MC 135c	48.46	1.37	6.55	0.130	22.95	16.60	0.13	0.01	0.116	< 0.01	3.61	99.94	56	< 1	40	2110	75	270	< 10	< 30	2	2.2	< 5
17RAY-MC 136a	45.48	3.16	13.90	0.221	19.74	16.28	0.17	0.01	0.426	< 0.01	0.82	100.2	77	< 1	265	1000	84	170	< 10	50	6	2.2	< 5
17RAY-MC 137a	47.31	14.98	10.32	0.157	8.10	10.74	2.88	0.81	0.814	0.22	3.19	99.51	49	< 1	327	170	36	60	110	70	14	1.6	< 5
17RAY-MC 018a1	50.71	15.84	7.80	0.125	5.72	8.04	3.26	1.68	1.759	0.56	3.88	99.37	31	1	192	230	36	100	< 10	60	17	1.5	< 5
17RAY-MC 018b2	50.51	17.21	7.74	0.119	6.38	7.25	3.89	1.75	1.783	0.35	3.18	100.2	31	2	194	270	39	130	< 10	60	17	1.3	< 5
17RAY-MC 019b2	66.53	15.85	1.76	0.028	1.04	2.71	4.58	2.98	0.222	0.05	3.20	98.96	4	< 1	35	20	4	< 20	< 10	< 30	16	0.8	< 5
17RAY-MC 020a1	41.19	16.52	11.98	0.059	2.14	10.37	0.43	2.77	3.043	1.11	10.80	100.4	29	2	131	300	33	140	< 10	80	21	1.1	9
17RAY-MC 021a1	42.40	1.20	8.40	0.143	42.24	2.75	0.08	0.04	0.020	< 0.01	1.26	98.51	8	< 1	33	2700	111	2310	20	50	1	2.4	6
17RAY-MC 021b1	74.93	12.62	1.22	0.028	0.61	0.40	3.31	5.13	0.102	0.03	0.49	98.86	1	3	< 5	< 20	2	30	30	60	16	1.5	< 5
17RAY-MC 021c1	48.61	13.94	13.18	0.244	5.62	11.82	3.22	0.41	1.888	0.19	0.49	99.61	44	< 1	385	110	44	60	80	160	19	2.2	< 5
17RAY-MC 021d1	56.17	18.89	6.67	0.173	1.27	4.34	5.22	4.49	1.437	0.41	0.57	99.63	4	4	57	< 20	7	< 20	10	150	23	1.9	< 5
17RAY-MC 020a2	33.41	14.40	10.72	0.065	1.88	17.06	0.34	2.41	2.833	0.72	15.82	99.67	26	2	170	330	24	110	< 10	70	19	0.9	7
17RAY-MC 024a2	37.63	14.02	7.49	0.148	8.24	12.87	0.12	2.28	2.415	0.66	14.30	100.2	23	2	199	290	32	100	< 10	60	15	1.2	< 5
17RAY-MC 024a5	38.99	14.39	8.20	0.137	10.54	9.39	1.81	1.10	2.552	0.77	12.03	99.91	22	2	154	230	32	100	< 10	70	17	1.4	< 5
17RAY-MC 025b2	54.08	13.35	8.06	0.137	7.62	8.27	2.65	0.87	1.146	0.22	2.36	98.76	27	1	197	360	27	< 20	20	80	17	1.6	< 5
17RAY-MC 029b2	43.27	16.93	8.81	0.129	9.25	5.49	0.84	2.35	2.337	0.96	8.73	99.11	17	3	159	90	27	30	< 10	60	18	1.3	< 5
17RAY-MC 029b3	36.66	13.99	8.56	0.134	8.14	12.63	0.78	1.84	2.446	0.73	13.77	99.68	22	2	135	250	49	140	< 10	70	17	1.3	6
17RAY-MC 034b1	42.55	16.14	7.88	0.119	6.57	9.25	3.70	1.64	2.959	0.77	8.20	99.78	23	2	244	60	31	40	20	90	19	1.3	< 5
17RAY-MC 039a2	45.50	15.37	8.44	0.183	9.67	10.55	2.77	0.13	1.836	0.37	4.81	99.64	33	1	243	570	41	150	160	50	16	1.5	< 5
17RAY-MC 039b2	47.85	19.34	10.99	0.133	2.06	10.18	1.22	3.27	2.054	0.14	2.78	100.0	37	1	100	580	32	160	< 10	30	21	2.4	< 5
17RAY-MC 039c2	48.70	16.94	11.50	0.132	5.74	4.09	4.80	1.59	2.070	0.39	3.19	99.15	41	< 1	148	690	50	180	< 10	70	15	0.9	< 5
17RAY-MC 042a1	47.81	16.69	9.09	0.131	6.91	8.47	3.33	1.45	2.391	0.47	3.19	99.93	27	2	241	150	34	40	10	60	19	1.5	< 5
17RAY-MC 045a1	47.93	14.79	9.01	0.132	8.61	8.36	2.40	1.86	2.024	0.37	3.37	98.85	30	1	236	600	41	150	60	60	17	1.5	< 5
17RAY-MC 049a2	47.58	15.71	10.05	0.166	9.04	7.81	3.08	0.48	2.168	0.39	3.90	100.4	28	1	252	370	42	100	50	70	18	1.4	< 5
17RAY-MC 050a2	55.72	16.80	9.35	0.149	1.97	4.95	4.53	2.89	1.387	0.60	1.54	99.88	15	3	35	< 20	10	< 20	< 10	110	24	1.7	< 5
17RAY-MC 138a	42.59	2.82	15.75	0.242	20.59	15.29	0.17	0.02	0.466	< 0.01	0.88	98.81	71	< 1	214	1380	91	210	< 10	60	7	2.2	< 5
17RAY-MC 140a	36.76	0.26	13.40	0.247	43.19	1.53	0.03	< 0.01	0.026	< 0.01	4.57	100.0	9	< 1	11	2930	160	770	< 10	70	1	1.4	< 5
17RAY-MC 143a	50.13	16.70	9.79	0.180	6.36	8.28	3.06	1.25	0.876	0.15	3.47	100.3	35	< 1	276	70	32	20	70	80	18	1.5	< 5
17RAY-MC 143b	49.03	18.04	8.49	0.187	4.22	10.99	3.44	0.35	0.794	0.17	4.38	100.1	25	< 1	244	40	25	< 20	60	70	18	1.5	< 5
17RAY-MC 143c	57.81	15.18	7.06	0.162	3.65	5.59	2.27	1.67	0.604	0.22	4.68	98.88	19	< 1	182	40	18	20	160	130	17	1.2	< 5
17RAY-MC 148a	49.34	14.50	6.63	0.172	8.60	10.10	3.25	0.20	0.385	0.18	5.90	99.25	30	< 1	127	110	25	50	< 10	110	13	1.7	< 5
17RAY-MC 148b	44.45	20.08	5.38	0.114	7.52	19.09	0.53	0.02	0.335	< 0.01	2.86	100.4	57	< 1	141	160	23	80	< 10	60	14	1.8	< 5
17RAY-MC 148b4	40.80	20.67	10.33	0.136	8.27	14.54	0.80	0.10	1.035	< 0.01	3.70	100.4	49	< 1	425	30	34	50	10	130	17	1.8	17
17RAY-MC 149a	57.53	16.75	6.64	0.047	3.42	6.23	2.01	2.07	0.766	0.20	4.45	100.1	24	< 1	473	80	18	40	100	550	17	1.2	29
17RAY-MC 151a	94.71	1.75	1.18	0.026	0.31	0.21	0.18	0.42	0.057	< 0.01	0.41	99.24	3	< 1	15	180	4	< 20	20	< 30	3	1.2	5
17RAY-MC 153a	94.34	2.09	1.16	0.011	0.41	0.12	0.25	0.48	0.086	< 0.01	0.46	99.40	4	< 1	18	< 20	2	< 20	70	< 30	4	1.3	< 5
17RAY-MC 156a	94.25	2.04	1.36	0.020	0.42	0.06	0.15	0.58	0.093	< 0.01	0.43	99.42	4	< 1	20	190	3	< 20	50	< 30	4	1.2	< 5
17RAY-MC 157a	86.31	5.21	2.60	0.020	1.13	0.04	0.26	1.56	0.226	0.04	1.46	98.86	12	1	41	150	4	20	60	50	11	2.2	< 5
17RAY-MC 158a	93.88	1.98	1.43	0.011	0.25	0.03	0.23	0.61	0.095	< 0.01	0.37	98.89	4	< 1	17	< 20	4	< 20	40	< 30	4	1.0	< 5

Results

Activation Laboratories Ltd.

Report: A17-14248

Analyte Symbol	SiO2	Al2O3	Fe2O3(T)	MnO	MgO	CaO	Na2O	K2O	TiO2	P2O5	LOI	Total	Sc	Be	V	Cr	Co	Ni	Cu	Zn	Ga	Ge	As
Unit Symbol	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.01	0.01	0.01	0.001	0.01	0.01	0.01	0.01	0.001	0.01		0.01	1	1	5	20	1	20	10	30	1	0.5	5
Method Code	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
17RAY-MC 144a	48.80	15.83	11.09	0.187	7.33	7.48	3.85	0.34	1.384	0.30	3.74	100.3	40	< 1	322	300	36	80	120	80	17	1.9	< 5
17RAY-MC 146a	49.01	14.28	10.87	0.185	7.62	11.11	2.61	1.21	0.778	0.24	2.36	100.3	48	< 1	354	150	37	30	120	90	16	2.3	< 5
17RAY-MC 147a	49.38	17.05	7.81	0.153	5.18	6.68	3.88	2.19	0.801	0.27	6.83	100.2	26	< 1	236	70	24	30	120	70	18	1.4	7
17RAY-MC 154a	92.17	3.15	1.89	0.048	0.80	0.11	0.24	0.92	0.135	0.01	0.76	100.2	7	< 1	34	140	6	< 20	50	< 30	6	1.3	7
17RAY-MC 157b	87.83	4.74	2.19	0.018	0.92	0.08	0.30	1.56	0.184	0.01	1.25	99.06	11	1	37	120	3	< 20	40	30	9	1.7	< 5
17RAY-MC 159a	69.06	14.97	2.84	0.052	1.85	3.33	4.21	1.34	0.400	0.15	1.66	99.86	6	1	59	30	7	< 20	10	50	18	1.1	< 5
17RAY-MC 160b	88.08	5.03	2.14	0.011	0.78	0.32	0.23	1.16	0.251	< 0.01	1.86	99.88	8	< 1	50	120	3	< 20	30	30	8	1.3	8
17RAY-MC 163a	55.24	17.09	6.88	0.093	3.46	6.72	3.94	0.46	0.621	0.11	4.42	99.03	19	< 1	169	110	17	30	50	70	17	1.6	7
17RAY-MC 163b	97.98	0.23	0.78	0.006	0.05	0.05	0.02	0.05	0.008	< 0.01	0.04	99.21	< 1	< 1	< 5	150	< 1	< 20	< 10	< 30	< 1	0.6	< 5
17RAY-MC 165b1	44.27	15.59	9.55	0.170	9.14	7.05	2.01	1.28	1.258	0.17	9.69	100.2	33	< 1	209	350	37	100	< 10	80	14	2.1	34
17RAY-MC 168a	94.56	2.08	1.37	0.020	0.58	0.20	0.14	0.57	0.067	0.01	0.59	100.2	3	< 1	17	160	3	< 20	20	< 30	4	1.1	< 5
17RAY-MC 171a	92.66	2.97	1.25	0.027	0.57	0.19	0.28	0.87	0.143	0.01	0.76	99.73	6	< 1	30	130	4	< 20	20	< 30	5	1.3	< 5
17RAY-MC 171b	78.60	9.14	4.03	0.046	1.57	0.04	0.68	2.54	0.428	0.03	1.86	98.96	13	2	69	90	6	< 20	70	50	13	2.2	< 5
17RAY-MC 173a	92.80	2.23	1.76	0.018	0.55	0.10	0.14	0.61	0.079	0.04	0.49	98.82	3	< 1	16	230	3	< 20	30	< 30	4	1.1	< 5
17RAY-MC 175a	90.88	3.36	1.87	0.016	0.81	0.03	0.44	0.62	0.157	< 0.01	1.00	99.19	7	< 1	42	130	2	< 20	60	< 30	6	1.3	< 5
17RAY-MC 176a	76.29	10.07	4.20	0.077	1.49	0.15	0.97	2.35	0.481	0.12	2.89	99.09	13	2	112	80	6	< 20	50	90	15	2.0	< 5
17RAY-MC 179a	62.27	11.59	7.53	0.140	3.71	4.84	3.30	0.58	0.761	0.09	5.16	99.97	21	< 1	218	70	20	< 20	60	80	12	1.1	< 5
17RAY-MC 179b	54.03	13.52	7.84	0.152	4.39	6.77	3.26	0.75	0.811	0.08	8.26	99.86	23	< 1	241	80	21	< 20	40	90	13	1.4	10
17RAY-MC 182a	93.59	2.81	1.30	0.015	0.41	0.13	0.09	0.70	0.098	0.04	0.85	100.0	4	< 1	23	120	2	< 20	30	< 30	5	1.1	< 5
17RAY-MC 186b	95.38	2.01	1.15	0.014	0.21	0.03	0.14	0.49	0.065	< 0.01	0.55	100.0	2	< 1	21	140	1	< 20	20	< 30	3	1.4	< 5
17RAY-MC 192a	78.15	8.99	4.35	0.147	1.73	0.04	0.22	2.11	0.383	0.03	2.37	98.50	12	2	66	70	6	30	70	80	15	2.3	< 5
17RAY-MC 200c	42.49	16.32	14.19	0.119	7.35	3.31	2.95	1.11	4.332	0.58	6.39	99.15	32	1	276	20	44	30	20	110	23	1.9	32
17RAY-MC 214a	36.04	12.54	6.51	0.148	4.55	18.24	1.75	1.48	0.996	0.14	16.85	99.24	26	< 1	117	260	9	70	50	60	10	1.2	23
17RAY-MC 220a	91.18	3.59	1.66	0.017	0.59	0.21	0.34	1.03	0.176	0.02	0.88	99.70	4	< 1	36	120	4	30	1530	180	6	1.1	< 5
17RAY-MC 215a	92.16	2.86	1.37	0.011	0.47	0.13	0.16	0.79	0.139	0.06	0.61	98.77	4	< 1	25	20	2	< 20	40	< 30	5	1.3	< 5
17RAY-MC 223b	54.60	15.81	8.93	0.130	4.57	7.65	2.73	0.86	0.916	0.11	3.76	100.1	26	< 1	267	80	24	< 20	40	80	18	1.8	8
17RAY-MC 233b	65.81	14.77	5.59	0.043	2.81	0.22	1.70	2.77	0.661	0.13	5.04	99.53	26	2	197	70	7	< 20	30	90	18	2.0	14
17RAY-MC 233c	83.73	7.07	2.69	0.018	1.22	0.04	0.34	1.77	0.297	0.03	2.08	99.27	10	1	78	40	2	< 20	30	40	10	1.4	< 5
17RAY-MC 235a	94.16	2.09	1.80	0.030	0.55	0.06	0.10	0.55	0.077	0.02	0.51	99.94	3	< 1	16	170	5	20	20	< 30	4	1.4	< 5
17RAY-MC 236a	49.94	13.57	9.39	0.133	6.58	6.35	3.10	1.05	3.266	0.50	6.25	100.1	28	1	260	210	31	70	60	70	18	1.6	12
17RAY-MC 243a	93.76	2.01	1.40	0.038	0.31	0.37	0.22	0.65	0.105	0.06	0.67	99.59	4	< 1	18	< 20	3	< 20	30	40	3	1.1	< 5
17RAY-MC 245a	86.99	6.21	1.97	0.016	0.96	0.06	0.33	1.70	0.230	0.02	1.54	100.0	11	1	49	100	12	40	130	140	10	1.4	< 5
17RAY-MC 245b	95.07	2.16	1.25	0.024	0.41	0.07	0.10	0.55	0.068	0.01	0.48	100.2	3	< 1	27	< 20	1	< 20	20	< 30	5	1.3	< 5
17RAY-MC 249a	89.04	4.08	1.84	0.061	0.58	0.23	0.78	0.76	0.173	0.04	0.99	98.59	5	< 1	42	130	5	< 20	40	< 30	5	1.3	< 5
17RAY-MC 250b	49.83	15.12	7.44	0.121	6.84	7.64	4.30	1.90	1.106	0.94	4.55	99.80	14	2	154	230	25	110	30	120	17	1.2	< 5
17RAY-MC 256a	93.93	1.72	0.97	0.028	0.48	0.29	0.14	0.38	0.058	0.01	0.58	98.57	2	< 1	12	< 20	2	< 20	20	< 30	3	1.1	< 5
17RAY-MC 258a	93.04	2.49	1.06	0.034	0.44	0.06	0.25	0.76	0.102	0.01	0.44	98.68	5	< 1	31	< 20	3	< 20	20	40	5	1.7	< 5
17RAY-MC 083a3 Missing																							
15ZE 1195	43.64	19.01	11.79	0.104	4.70	5.70	2.50	2.68	3.218	0.15	6.21	99.69	20	1	204	30	30	20	40	100	23	1.3	6
16ZE 1264	54.46	17.93	7.79	0.187	2.89	6.51	4.52	3.09	0.980	0.51	0.90	99.77	14	2	205	< 20	13	< 20	< 10	90	21	1.4	< 5

Analyte Symbol	SiO2	Al2O3	Fe2O3(T)	MnO	MgO	CaO	Na2O	K2O	TiO2	P2O5	LOI	Total	Sc	Be	V	Cr	Co	Ni	Cu	Zn	Ga	Ge	As
Unit Symbol	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.01	0.01	0.01	0.001	0.01	0.01	0.01	0.01	0.001	0.01		0.01	1	1	5	20	1	20	10	30	1	0.5	5
Method Code	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
16ZE 1298	45.38	18.96	5.67	0.157	9.21	11.96	0.91	2.91	0.174	< 0.01	4.92	100.2	26	< 1	99	90	27	70	< 10	30	16	2.8	< 5
16ZE 1331a	39.05	14.42	12.86	0.184	6.73	8.54	2.19	2.54	3.116	1.29	8.05	98.98	19	3	204	90	38	50	40	120	19	1.6	< 5
16ZE 1333	57.78	14.31	6.36	0.077	4.09	8.23	2.09	0.94	0.558	0.14	5.71	100.3	23	< 1	92	40	18	< 20	110	80	13	2.1	< 5
17RAY-MC 102b1	50.88	16.08	6.68	0.167	9.19	11.85	2.17	0.34	0.425	0.06	2.91	100.8	55	< 1	146	260	27	70	< 10	40	12	1.7	< 5
17-RAY-MC 82(light colour)	33.51	12.94	7.27	0.107	7.55	15.97	0.08	1.53	2.344	0.69	16.71	98.71	17	2	155	90	28	50	< 10	70	17	1.0	< 5

Results

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Analyte Symbol	Rb	Sr	Y	Zr	Nb	Mo	Ag	In	Sn	Sb	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	1	2	0.5	1	0.2	2	0.5	0.1	1	0.2	0.1	2	0.05	0.05	0.01	0.05	0.01	0.005	0.01	0.01	0.01	0.01	0.01
Method Code	FUS-MS	FUS-ICP	FUS-MS	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
17RAY-MC 051a2	14	451	21.0	146	24.4	< 2	< 0.5	< 0.1	1	< 0.2	< 0.1	246	23.7	48.4	5.54	22.0	4.77	1.65	4.76	0.75	4.20	0.74	2.06
17RAY-MC 051b1	26	1732	33.1	306	72.7	< 2	1.1	0.2	4	< 0.2	0.1	404	52.0	113	11.6	40.7	8.24	2.16	7.01	1.28	7.64	1.46	3.99
17RAY-MC 055c3	4	183	21.2	68	8.5	< 2	< 0.5	< 0.1	< 1	< 0.2	0.3	1144	7.54	16.3	2.10	9.16	2.58	0.875	3.19	0.58	3.66	0.75	2.18
17RAY-MC 055d1	4	12	3.1	9	0.7	14	< 0.5	< 0.1	< 1	< 0.2	0.1	180	2.67	4.21	0.72	2.93	0.54	0.124	0.54	0.10	0.51	0.10	0.27
17RAY-MC 062a1	< 1	922	29.0	346	68.2	< 2	1.1	< 0.1	2	< 0.2	0.1	66	70.5	138	15.0	54.7	9.77	2.96	8.01	1.15	5.93	1.02	2.72
17RAY-MC 066a1	5	496	25.2	395	107	< 2	1.2	< 0.1	3	0.2	0.3	200	52.9	106	9.66	34.4	5.91	2.02	5.54	0.86	4.66	0.87	2.39
17RAY-MC 066b1	33	523	26.5	489	114	< 2	1.5	< 0.1	3	0.3	0.9	1016	109	194	19.4	63.8	10.3	3.19	7.68	1.09	5.56	0.99	2.56
17RAY-MC 073b1	40	452	4.8	90	3.0	< 2	< 0.5	< 0.1	< 1	0.4	1.1	1507	20.4	35.0	3.70	12.5	2.05	0.689	1.43	0.19	0.98	0.16	0.37
17RAY-MC 073c1	< 1	117	27.6	69	1.8	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	35	2.96	8.96	1.48	7.91	2.72	0.966	4.13	0.76	4.78	0.99	2.79
17RAY-MC 073c2	< 1	124	29.1	72	1.3	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	29	2.98	9.26	1.57	8.21	2.87	1.05	4.22	0.81	5.16	1.07	3.10
17RAY-MC 074c1	26	322	3.5	64	1.1	3	< 0.5	< 0.1	< 1	< 0.2	5.1	606	8.40	14.3	1.51	5.73	0.83	0.289	0.78	0.11	0.66	0.13	0.32
17RAY-MC 075a1	18	13	6.3	18	1.4	< 2	< 0.5	< 0.1	< 1	0.4	0.7	358	5.26	15.4	1.45	5.90	1.29	0.282	1.16	0.18	1.12	0.23	0.63
17RAY-MC 081b1	4	102	12.3	66	2.0	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	184	9.57	19.6	2.34	9.52	2.07	0.545	2.05	0.38	2.30	0.47	1.34
17RAY-MC 082a2	48	189	34.5	454	92.4	< 2	1.5	< 0.1	2	< 0.2	0.6	1143	102	186	19.7	67.5	11.9	3.56	9.26	1.38	7.17	1.23	3.13
17RAY-MC 082b1	5	311	31.5	179	41.2	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	118	37.5	74.4	7.58	28.1	5.35	1.88	5.71	0.87	4.46	0.81	2.09
17RAY-MC 094a1	< 1	23	7.3	3	0.2	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	4	0.31	0.95	0.19	1.22	0.46	0.258	0.98	0.19	1.31	0.26	0.75
17RAY-MC 094b1	< 1	73	6.4	4	< 0.2	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	26	0.25	0.64	0.14	0.92	0.47	0.240	0.84	0.18	1.22	0.24	0.67
17RAY-MC 095a1	< 1	32	7.6	3	< 0.2	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	7	0.25	0.77	0.16	1.11	0.45	0.246	0.98	0.20	1.28	0.28	0.83
17RAY-MC 096a1	38	54	12.9	64	5.5	4	< 0.5	< 0.1	< 1	< 0.2	1.6	4458	13.2	30.9	3.27	12.2	2.50	0.492	2.28	0.38	2.27	0.46	1.33
17RAY-MC 096b1	95	359	3.8	76	1.0	< 2	< 0.5	< 0.1	< 1	< 0.2	2.5	2590	9.12	16.7	1.82	6.70	1.20	0.441	1.06	0.15	0.74	0.12	0.30
17RAY-MC 097b1	13	113	30.7	20	1.1	< 2	< 0.5	< 0.1	< 1	< 0.2	0.3	561	28.5	13.0	5.11	20.7	4.42	1.14	4.91	0.70	3.99	0.79	2.23
17RAY-MC 098a1	73	661	5.2	4	< 0.2	< 2	< 0.5	< 0.1	< 1	2.1	1.5	1243	1.34	2.75	0.47	2.47	0.86	0.348	1.04	0.18	1.04	0.20	0.52
17RAY-MC 099b1	9	302	14.5	86	4.9	< 2	< 0.5	< 0.1	< 1	0.3	0.3	243	14.5	27.6	3.10	12.4	2.53	0.812	2.42	0.38	2.16	0.45	1.37
17RAY-MC 101b2	< 1	448	3.0	4	< 0.2	< 2	< 0.5	< 0.1	< 1	0.5	< 0.1	31	0.78	1.57	0.24	1.42	0.45	0.300	0.63	0.11	0.61	0.11	0.31
17RAY-MC 103a1	< 1	425	14.8	86	5.0	3	< 0.5	< 0.1	2	0.3	< 0.1	110	10.4	19.9	2.39	9.41	2.25	0.708	2.36	0.39	2.42	0.51	1.53
17RAY-MC 103b1	12	350	14.3	104	5.5	< 2	< 0.5	< 0.1	< 1	< 0.2	0.3	758	14.3	26.6	2.99	11.2	2.23	0.783	2.12	0.36	2.19	0.44	1.33
17RAY-MC 103c1	7	690	7.4	45	3.2	< 2	< 0.5	< 0.1	< 1	0.6	0.2	364	3.93	8.24	1.04	4.18	1.09	0.542	1.10	0.20	1.19	0.24	0.76
17RAY-MC 105a1	1	491	6.0	30	1.5	< 2	< 0.5	< 0.1	< 1	1.2	< 0.1	121	2.97	5.86	0.72	3.35	0.85	0.759	1.10	0.19	1.15	0.22	0.62
17RAY-MC 105b1	12	383	11.6	111	5.7	< 2	< 0.5	< 0.1	< 1	< 0.2	0.3	726	16.1	29.5	3.22	11.6	2.22	0.733	1.89	0.28	1.64	0.34	1.09
17RAY-MC 109a1	2	261	9.5	7	< 0.2	< 2	< 0.5	< 0.1	< 1	0.7	< 0.1	89	0.95	2.77	0.52	2.95	1.21	0.524	1.76	0.31	1.84	0.35	0.99
17RAY-MC 112b2	11	1336	17.8	61	7.0	< 2	< 0.5	< 0.1	< 1	7.8	0.2	653	6.58	14.5	1.97	8.65	2.53	0.934	2.92	0.54	2.96	0.61	1.73
17RAY-MC 113a1	21	305	19.0	41	1.5	< 2	< 0.5	< 0.1	< 1	0.4	0.4	370	4.36	10.2	1.54	7.47	2.57	0.700	3.26	0.57	3.53	0.69	1.89
17RAY-MC 119a1	< 1	5	< 0.5	< 1	< 0.2	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	3	< 0.05	0.08	0.02	0.09	0.03	0.013	0.02	< 0.01	0.04	< 0.01	0.02
17RAY-MC 123a	22	302	17.9	58	1.7	< 2	< 0.5	< 0.1	< 1	0.2	1.9	464	8.40	19.6	2.79	12.5	3.38	1.15	3.62	0.58	3.49	0.66	1.84
17RAY-MC 124a	31	379	17.9	41	1.9	< 2	< 0.5	< 0.1	< 1	< 0.2	0.6	1059	6.14	14.1	1.97	9.28	2.77	0.777	3.28	0.57	3.31	0.66	1.89
17RAY-MC 124b	29	515	19.8	73	2.7	< 2	< 0.5	< 0.1	1	1.0	0.6	1303	8.36	18.7	2.57	11.4	2.92	1.08	3.38	0.57	3.58	0.70	1.95
17RAY-MC 125a	30	369	17.9	53	1.7	< 2	< 0.5	< 0.1	< 1	0.3	0.4	1032	8.09	15.5	2.25	10.1	2.56	0.818	2.93	0.49	3.11	0.62	1.69
17RAY-MC 125d	33	479	16.3	44	1.4	< 2	< 0.5	< 0.1	< 1	0.9	0.8	984	5.81	13.0	1.85	8.66	2.44	0.893	2.98	0.52	3.04	0.58	1.66
17RAY-MC 126a	12	94	13.1	36	3.0	< 2	< 0.5	< 0.1	< 1	0.7	0.4	345	4.32	9.18	1.30	6.11	1.77	0.588	2.19	0.38	2.23	0.45	1.28
17RAY-MC 129a	64	518	18.0	57	1.4	< 2	< 0.5	< 0.1	< 1	0.5	0.9	1472	7.54	16.8	2.34	10.4	2.62	0.916	3.09	0.53	3.24	0.63	1.78
17RAY-MC 132d	< 1	33	2.5	< 1	< 0.2	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	9	0.15	0.58	0.14	0.71	0.30	0.132	0.50	0.09	0.49	0.09	0.24

Results

Activation Laboratories Ltd.

Report: A17-14248

Analyte Symbol	Rb	Sr	Y	Zr	Nb	Mo	Ag	In	Sn	Sb	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	1	2	0.5	1	0.2	2	0.5	0.1	1	0.2	0.1	2	0.05	0.05	0.01	0.05	0.01	0.005	0.01	0.01	0.01	0.01	0.01
Method Code	FUS-MS	FUS-ICP	FUS-MS	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
17RAY-MC 133a	< 1	5	< 0.5	1	< 0.2	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	6	0.05	0.08	< 0.01	0.05	< 0.01	< 0.005	0.05	< 0.01	< 0.01	< 0.01	< 0.01
17RAY-MC 135b	< 1	53	2.9	2	< 0.2	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	9	0.19	0.63	0.14	0.82	0.34	0.146	0.59	0.09	0.53	0.10	0.28
17RAY-MC 135c	< 1	34	2.1	< 1	< 0.2	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	9	0.17	0.44	0.10	0.68	0.31	0.094	0.38	0.07	0.43	0.08	0.20
17RAY-MC 136a	< 1	41	6.8	6	< 0.2	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	7	0.27	1.11	0.27	1.89	0.81	0.315	1.30	0.23	1.44	0.27	0.68
17RAY-MC 137a	13	416	15.5	38	1.5	< 2	< 0.5	< 0.1	< 1	0.5	0.6	265	4.96	10.7	1.55	7.30	2.29	0.883	2.75	0.47	2.84	0.55	1.52
17RAY-MC 018a1	34	406	32.6	181	44.8	< 2	< 0.5	< 0.1	2	< 0.2	0.2	497	28.3	57.5	6.92	26.9	5.84	1.79	6.04	1.00	5.87	1.14	3.11
17RAY-MC 018b2	35	322	30.7	170	43.9	< 2	< 0.5	< 0.1	1	< 0.2	0.3	484	30.8	54.7	6.86	26.5	5.97	1.68	5.85	0.98	5.46	1.07	3.08
17RAY-MC 019b2	61	154	3.7	52	1.0	< 2	< 0.5	< 0.1	< 1	< 0.2	1.2	980	5.11	9.62	1.07	4.88	0.96	0.317	0.88	0.13	0.70	0.12	0.32
17RAY-MC 020a1	55	247	35.3	453	93.7	< 2	1.3	< 0.1	3	0.8	0.6	743	89.8	167	18.0	65.6	11.2	3.29	8.91	1.31	7.12	1.23	3.28
17RAY-MC 021a1	< 1	103	< 0.5	2	0.4	< 2	< 0.5	< 0.1	< 1	0.4	0.2	9	0.42	0.60	0.07	0.27	0.06	0.039	0.07	0.01	0.09	0.02	0.07
17RAY-MC 021b1	128	90	19.0	81	4.8	< 2	0.6	< 0.1	1	< 0.2	1.6	690	54.3	95.1	9.35	30.3	4.55	0.259	3.22	0.49	2.85	0.60	1.92
17RAY-MC 021c1	9	200	36.5	126	4.8	3	< 0.5	0.2	5	0.4	1.3	538	7.64	19.8	2.89	14.6	4.45	1.57	5.92	1.03	6.55	1.29	3.54
17RAY-MC 021d1	118	356	34.2	648	144	< 2	2.0	< 0.1	3	0.6	4.8	1842	114	229	21.7	68.7	10.1	3.09	7.62	1.16	6.78	1.21	3.59
17RAY-MC 020a2	48	307	29.3	396	80.7	< 2	1.2	< 0.1	2	0.6	0.5	576	72.0	140	15.1	55.5	10.1	3.13	8.11	1.18	6.16	1.06	2.81
17RAY-MC 024a2	39	554	25.5	351	70.0	< 2	1.0	< 0.1	2	< 0.2	0.8	617	66.1	127	13.4	49.9	8.38	2.56	6.81	1.02	5.26	0.94	2.48
17RAY-MC 024a5	18	453	26.6	375	74.1	< 2	1.0	< 0.1	2	0.4	0.4	306	71.9	140	14.9	55.3	9.42	2.83	7.16	1.10	5.71	0.97	2.54
17RAY-MC 025b2	15	606	19.8	117	7.2	< 2	< 0.5	< 0.1	< 1	< 0.2	0.3	652	22.9	48.5	5.71	23.3	4.66	1.46	4.36	0.66	3.66	0.70	1.95
17RAY-MC 029b2	35	402	29.5	399	115	< 2	1.2	< 0.1	2	0.4	0.8	748	94.3	169	16.9	57.7	9.89	2.96	7.66	1.11	5.93	1.05	2.93
17RAY-MC 029b3	26	452	27.6	368	77.9	< 2	1.1	< 0.1	2	0.5	0.5	495	70.6	137	14.5	53.3	9.30	2.76	7.55	1.08	5.74	0.97	2.69
17RAY-MC 034b1	25	538	29.8	432	95.1	< 2	1.2	< 0.1	2	0.7	0.7	1477	88.0	167	17.5	62.8	10.7	3.19	8.20	1.18	6.37	1.08	2.88
17RAY-MC 039a2	2	321	18.3	151	33.4	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	75	32.3	61.8	6.72	25.3	4.93	1.66	4.36	0.69	3.74	0.65	1.78
17RAY-MC 039b2	68	1232	22.3	185	41.2	< 2	< 0.5	< 0.1	2	0.3	0.5	862	33.5	70.6	7.22	28.0	5.68	1.88	5.25	0.84	4.69	0.83	2.29
17RAY-MC 039c2	35	153	19.3	172	38.5	< 2	< 0.5	< 0.1	1	< 0.2	0.2	375	29.7	65.5	6.82	26.2	5.06	1.83	4.89	0.75	4.11	0.74	1.91
17RAY-MC 042a1	28	475	24.2	234	43.6	< 2	0.6	< 0.1	1	< 0.2	0.2	345	41.0	82.0	9.04	35.0	6.69	2.24	6.05	0.92	5.01	0.88	2.29
17RAY-MC 045a1	41	431	21.1	175	32.9	< 2	0.5	< 0.1	1	< 0.2	0.7	477	29.6	61.1	6.76	27.1	5.64	1.76	5.06	0.79	4.35	0.78	2.11
17RAY-MC 049a2	7	357	22.8	194	33.7	< 2	0.6	< 0.1	1	< 0.2	< 0.1	164	31.1	63.3	6.99	28.3	5.64	1.95	5.40	0.87	4.86	0.89	2.25
17RAY-MC 050a2	52	389	42.4	399	64.8	3	1.0	< 0.1	3	< 0.2	0.2	930	66.8	131	14.3	54.2	10.5	3.39	9.51	1.45	8.27	1.52	4.11
17RAY-MC 138a	< 1	39	6.0	5	0.4	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	9	0.51	1.58	0.30	1.72	0.81	0.316	1.16	0.20	1.26	0.23	0.61
17RAY-MC 140a	< 1	4	< 0.5	< 1	0.5	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	< 2	0.44	0.81	0.09	0.31	0.07	0.031	0.08	< 0.01	0.07	0.01	0.04
17RAY-MC 143a	22	472	17.4	59	2.5	< 2	< 0.5	< 0.1	< 1	0.6	1.1	1061	6.87	14.8	1.97	9.11	2.52	0.975	2.97	0.50	3.09	0.62	1.77
17RAY-MC 143b	5	381	16.1	55	2.4	< 2	< 0.5	< 0.1	< 1	0.9	0.3	491	6.57	14.3	1.89	8.80	2.27	0.882	2.75	0.47	2.80	0.55	1.58
17RAY-MC 143c	37	270	21.1	81	2.6	< 2	< 0.5	< 0.1	< 1	1.0	1.4	1006	11.3	22.3	3.05	13.1	3.02	0.957	3.50	0.62	3.75	0.73	2.11
17RAY-MC 148a	4	388	12.3	38	3.6	< 2	< 0.5	< 0.1	< 1	1.7	0.2	117	7.78	15.8	1.92	8.40	2.03	0.754	2.19	0.37	2.18	0.44	1.27
17RAY-MC 148b	< 1	945	5.3	6	< 0.2	< 2	< 0.5	< 0.1	< 1	2.5	< 0.1	19	0.69	1.76	0.32	1.84	0.78	0.401	1.10	0.19	1.13	0.21	0.54
17RAY-MC 148b4	< 1	959	9.0	10	0.8	< 2	< 0.5	< 0.1	< 1	2.4	0.2	55	1.18	3.06	0.51	3.13	1.30	0.559	1.69	0.29	1.85	0.36	0.94
17RAY-MC 149a	49	315	36.9	98	3.0	19	0.6	< 0.1	< 1	3.0	1.9	583	11.3	23.1	3.33	15.5	4.13	1.36	5.07	0.90	5.85	1.22	3.79
17RAY-MC 151a	16	25	2.5	14	0.9	12	< 0.5	< 0.1	< 1	< 0.2	0.7	586	2.40	5.96	0.68	2.71	0.50	0.153	0.58	0.09	0.52	0.09	0.26
17RAY-MC 153a	18	17	3.7	18	1.2	< 2	< 0.5	< 0.1	< 1	< 0.2	0.9	479	3.29	8.19	0.83	3.18	0.68	0.148	0.66	0.11	0.64	0.12	0.35
17RAY-MC 156a	20	14	4.1	25	1.3	< 2	< 0.5	< 0.1	< 1	< 0.2	0.9	656	3.89	9.52	0.95	3.80	0.89	0.196	0.90	0.14	0.81	0.16	0.43
17RAY-MC 157a	48	29	8.4	48	3.2	6	< 0.5	< 0.1	< 1	< 0.2	1.8	3180	9.03	21.5	2.18	8.10	1.70	0.327	1.59	0.25	1.44	0.30	0.86
17RAY-MC 158a	23	13	4.1	24	1.4	< 2	< 0.5	< 0.1	< 1	0.3	0.9	850	4.09	8.80	0.95	3.62	0.73	0.176	0.76	0.13	0.80	0.15	0.42
17RAY-MC 144a	4	318	30.4	150	4.5	< 2	< 0.5	< 0.1	1	0.3	0.5	232	8.82	22.7	3.15	15.2	4.29	1.51	5.33	0.94	5.72	1.12	3.11

Results

Activation Laboratories Ltd.

Report: A17-14248

Analyte Symbol	Rb	Sr	Y	Zr	Nb	Mo	Ag	In	Sn	Sb	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	1	2	0.5	1	0.2	2	0.5	0.1	1	0.2	0.1	2	0.05	0.05	0.01	0.05	0.01	0.005	0.01	0.01	0.01	0.01	0.01
Method Code	FUS-MS	FUS-ICP	FUS-MS	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
17RAY-MC 146a	22	560	17.6	41	1.1	< 2	< 0.5	< 0.1	< 1	0.8	0.4	580	5.61	12.8	1.76	8.65	2.58	0.933	3.00	0.52	3.26	0.64	1.77
17RAY-MC 147a	39	361	18.2	77	8.0	< 2	< 0.5	< 0.1	< 1	0.6	1.2	1012	9.94	19.5	2.35	10.8	2.55	1.13	3.01	0.51	3.16	0.65	1.86
17RAY-MC 154a	30	19	5.5	33	1.8	< 2	< 0.5	< 0.1	< 1	< 0.2	1.6	2003	5.24	12.1	1.23	4.84	0.97	0.219	0.89	0.16	0.97	0.19	0.56
17RAY-MC 157b	48	28	7.2	49	2.8	6	< 0.5	< 0.1	< 1	0.2	1.5	3303	8.40	19.5	1.94	7.07	1.46	0.257	1.35	0.23	1.36	0.26	0.79
17RAY-MC 159a	24	532	7.8	99	4.1	< 2	< 0.5	< 0.1	< 1	< 0.2	0.9	902	16.0	30.1	3.49	12.9	2.56	0.760	1.96	0.28	1.50	0.25	0.70
17RAY-MC 160b	37	14	8.2	58	3.7	4	< 0.5	< 0.1	2	1.0	1.5	2833	9.35	19.9	2.02	7.55	1.40	0.251	1.31	0.22	1.37	0.27	0.79
17RAY-MC 163a	9	449	13.7	57	1.8	< 2	< 0.5	< 0.1	< 1	2.1	0.7	504	5.46	11.7	1.68	7.79	2.05	0.753	2.23	0.38	2.33	0.48	1.34
17RAY-MC 163b	< 1	3	0.6	3	< 0.2	11	< 0.5	< 0.1	< 1	< 0.2	< 0.1	71	0.51	0.77	0.12	0.33	0.13	0.024	0.09	0.01	0.08	0.02	0.07
17RAY-MC 165b1	33	244	16.0	78	6.5	< 2	< 0.5	< 0.1	< 1	0.4	1.3	650	5.80	15.7	2.32	10.9	2.77	0.997	3.04	0.49	2.99	0.58	1.58
17RAY-MC 168a	20	18	3.3	17	0.7	10	< 0.5	< 0.1	< 1	< 0.2	0.8	664	2.63	6.67	0.63	2.58	0.56	0.124	0.64	0.09	0.51	0.10	0.28
17RAY-MC 171a	28	36	5.0	34	2.1	< 2	< 0.5	< 0.1	< 1	0.2	1.1	1460	5.86	12.4	1.25	4.74	1.01	0.189	0.85	0.15	0.92	0.18	0.50
17RAY-MC 171b	80	41	15.2	93	6.8	3	< 0.5	< 0.1	2	0.5	3.2	5679	17.7	39.9	3.99	15.0	2.93	0.601	2.79	0.47	2.74	0.52	1.51
17RAY-MC 173a	23	25	5.2	18	1.1	< 2	< 0.5	< 0.1	< 1	< 0.2	0.9	652	3.12	7.74	0.76	3.20	0.65	0.195	0.66	0.13	0.80	0.16	0.48
17RAY-MC 175a	21	15	5.9	30	2.1	7	< 0.5	< 0.1	< 1	0.5	1.0	577	6.14	13.1	1.39	5.45	1.14	0.241	1.03	0.16	0.99	0.21	0.59
17RAY-MC 176a	81	32	19.7	88	4.6	< 2	< 0.5	< 0.1	1	< 0.2	4.4	2182	20.0	39.6	4.82	18.6	3.81	0.885	3.33	0.58	3.58	0.67	1.96
17RAY-MC 179a	9	179	12.2	47	2.1	< 2	< 0.5	< 0.1	< 1	0.4	0.5	1997	7.09	14.7	1.85	7.97	2.08	0.655	2.05	0.36	2.26	0.45	1.35
17RAY-MC 179b	21	258	12.3	47	2.0	< 2	< 0.5	< 0.1	< 1	0.4	1.0	1664	5.26	10.7	1.44	6.60	1.83	0.595	2.08	0.33	2.04	0.42	1.26
17RAY-MC 182a	24	14	2.4	19	1.0	7	< 0.5	< 0.1	< 1	< 0.2	1.1	966	3.70	8.55	0.77	2.95	0.60	0.137	0.46	0.07	0.40	0.08	0.25
17RAY-MC 186b	17	7	2.5	13	0.7	< 2	< 0.5	< 0.1	< 1	< 0.2	0.7	871	2.52	5.44	0.60	2.18	0.55	0.140	0.47	0.08	0.46	0.09	0.25
17RAY-MC 192a	80	16	14.0	64	6.8	2	< 0.5	< 0.1	3	3.1	3.0	3235	16.4	36.9	3.62	13.9	2.97	0.665	2.36	0.40	2.52	0.53	1.58
17RAY-MC 200c	30	95	35.4	366	55.7	< 2	0.9	< 0.1	2	1.0	1.4	847	43.2	94.6	11.6	49.3	10.3	2.69	8.33	1.24	7.02	1.28	3.49
17RAY-MC 214a	37	286	12.7	62	6.1	< 2	< 0.5	< 0.1	< 1	0.5	2.3	734	6.02	14.4	2.03	9.08	2.37	0.887	2.42	0.39	2.41	0.46	1.25
17RAY-MC 220a	29	11	5.8	30	2.7	6	< 0.5	< 0.1	75	3.5	1.1	1092	7.14	16.5	1.65	6.37	1.27	0.283	1.05	0.17	1.07	0.23	0.69
17RAY-MC 215a	29	8	10.8	25	1.8	< 2	< 0.5	< 0.1	< 1	< 0.2	1.2	528	8.31	18.9	2.02	8.26	1.57	0.399	1.70	0.27	1.75	0.35	0.98
17RAY-MC 223b	15	417	13.7	53	2.0	< 2	< 0.5	< 0.1	< 1	0.7	0.6	752	5.19	11.4	1.60	7.50	1.96	0.838	2.25	0.37	2.38	0.48	1.39
17RAY-MC 233b	103	80	11.0	84	3.0	< 2	< 0.5	< 0.1	1	< 0.2	4.8	2015	12.7	23.0	2.73	11.1	2.28	0.490	1.90	0.28	1.71	0.39	1.19
17RAY-MC 233c	64	18	5.8	52	3.0	< 2	< 0.5	< 0.1	< 1	0.7	2.7	1175	9.03	19.0	2.00	7.78	1.50	0.303	1.05	0.16	0.91	0.20	0.63
17RAY-MC 235a	15	16	2.5	19	1.0	10	< 0.5	< 0.1	< 1	< 0.2	0.5	1917	2.87	7.24	0.69	2.69	0.66	0.117	0.48	0.08	0.49	0.10	0.28
17RAY-MC 236a	23	261	27.9	298	45.5	< 2	0.7	< 0.1	2	0.6	3.3	1909	35.7	76.7	9.25	38.8	8.56	2.68	7.18	1.02	5.73	1.01	2.69
17RAY-MC 243a	18	39	4.9	24	1.5	< 2	< 0.5	< 0.1	< 1	0.5	0.9	1996	3.83	8.76	0.88	3.42	0.79	0.200	0.75	0.12	0.75	0.16	0.49
17RAY-MC 245a	65	20	9.3	47	3.2	< 2	< 0.5	< 0.1	1	0.5	3.0	2501	9.46	18.8	2.17	8.36	1.84	0.400	1.51	0.25	1.61	0.34	1.00
17RAY-MC 245b	22	8	3.1	16	1.7	< 2	< 0.5	< 0.1	< 1	< 0.2	0.9	891	3.61	7.95	0.87	3.46	0.62	0.178	0.62	0.09	0.55	0.12	0.35
17RAY-MC 249a	24	29	7.6	39	2.8	< 2	< 0.5	< 0.1	< 1	0.3	1.1	658	6.80	14.4	1.74	7.05	1.59	0.397	1.38	0.21	1.25	0.25	0.74
17RAY-MC 250b	31	1240	20.2	218	31.8	< 2	0.5	< 0.1	1	0.9	1.8	2213	63.8	125	14.1	52.8	9.34	2.61	6.23	0.75	4.02	0.66	1.81
17RAY-MC 256a	13	36	1.6	13	0.8	< 2	< 0.5	< 0.1	< 1	< 0.2	0.6	367	2.02	4.80	0.46	1.86	0.40	0.081	0.30	0.05	0.29	0.05	0.15
17RAY-MC 258a	27	24	4.8	28	1.8	< 2	< 0.5	< 0.1	< 1	< 0.2	1.5	2281	4.48	9.92	1.02	3.84	0.92	0.207	0.93	0.13	0.80	0.16	0.46
17RAY-MC 083a3 Missing																							
15ZE 1195	36	289	17.6	256	39.3	< 2	0.6	< 0.1	2	0.9	0.5	402	33.1	79.6	7.20	29.0	6.52	2.31	5.30	0.77	4.25	0.77	1.97
16ZE 1264	54	1829	30.0	248	16.0	< 2	0.6	< 0.1	1	0.6	0.6	3077	61.4	126	14.7	58.4	10.9	3.13	8.22	1.09	5.68	0.99	2.68
16ZE 1298	79	208	4.5	5	< 0.2	< 2	< 0.5	< 0.1	< 1	1.6	2.7	1458	0.63	1.45	0.20	1.04	0.41	0.187	0.55	0.10	0.77	0.17	0.49
16ZE 1331a	60	499	35.0	449	83.3	< 2	1.2	< 0.1	3	0.2	13.0	1078	72.4	147	17.3	68.3	13.1	4.22	10.0	1.38	7.12	1.24	3.27

Results

Activation Laboratories Ltd.

Report: A17-14248

Analyte Symbol	Rb	Sr	Y	Zr	Nb	Mo	Ag	In	Sn	Sb	Cs	Ba	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	1	2	0.5	1	0.2	2	0.5	0.1	1	0.2	0.1	2	0.05	0.05	0.01	0.05	0.01	0.005	0.01	0.01	0.01	0.01	0.01
Method Code	FUS-MS	FUS-ICP	FUS-MS	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
16ZE 1333	16	369	32.7	126	12.8	< 2	< 0.5	< 0.1	< 1	< 0.2	0.4	701	10.1	19.8	2.34	10.0	2.58	0.896	3.32	0.64	4.56	1.01	3.29
17RAY-MC 102b1	4	242	10.1	54	3.5	< 2	< 0.5	< 0.1	< 1	1.7	0.2	400	5.62	11.3	1.37	6.24	1.60	0.621	1.69	0.29	1.83	0.38	1.04
17-RAY-MC 82(light colour)	29	334	23.9	408	102	< 2	1.0	< 0.1	2	< 0.2	0.4	971	68.8	128	13.4	49.2	8.52	2.43	6.05	0.83	4.43	0.84	2.32

Analyte Symbol	Tm	Yb	Lu	Hf	Ta	W	Tl	Pb	Bi	Th	U
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.005	0.01	0.002	0.1	0.01	0.5	0.05	5	0.1	0.05	0.01
Method Code	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
17RAY-MC 051a2	0.296	1.93	0.288	2.8	2.10	1.4	< 0.05	< 5	0.1	2.93	0.81
17RAY-MC 051b1	0.574	3.61	0.540	6.8	5.58	0.8	< 0.05	< 5	< 0.1	8.91	1.01
17RAY-MC 055c3	0.311	1.90	0.301	1.5	0.66	< 0.5	< 0.05	< 5	< 0.1	0.84	0.44
17RAY-MC 055d1	0.042	0.31	0.048	0.1	0.04	1.0	< 0.05	< 5	< 0.1	0.47	0.61
17RAY-MC 062a1	0.362	2.25	0.322	6.7	5.53	< 0.5	< 0.05	< 5	< 0.1	9.79	2.32
17RAY-MC 066a1	0.335	2.24	0.344	7.4	5.17	1.1	< 0.05	9	< 0.1	12.8	6.23
17RAY-MC 066b1	0.355	2.20	0.319	8.5	8.73	2.1	< 0.05	5	< 0.1	20.3	3.72
17RAY-MC 073b1	0.055	0.39	0.056	1.7	0.25	1.6	0.22	7	< 0.1	3.99	1.41
17RAY-MC 073c1	0.412	2.73	0.438	1.5	0.14	< 0.5	< 0.05	< 5	< 0.1	0.23	0.17
17RAY-MC 073c2	0.454	3.03	0.478	1.7	0.08	< 0.5	< 0.05	< 5	< 0.1	0.21	0.14
17RAY-MC 074c1	0.039	0.32	0.050	1.3	0.11	< 0.5	0.16	9	< 0.1	2.36	0.96
17RAY-MC 075a1	0.082	0.62	0.103	0.3	0.12	7.9	0.21	8	0.1	1.16	0.50
17RAY-MC 081b1	0.193	1.27	0.198	1.2	0.28	< 0.5	< 0.05	< 5	< 0.1	2.24	1.00
17RAY-MC 082a2	0.420	2.61	0.372	8.6	7.09	3.1	< 0.05	8	< 0.1	14.8	3.40
17RAY-MC 082b1	0.266	1.57	0.222	3.4	2.59	< 0.5	< 0.05	< 5	< 0.1	5.53	1.02
17RAY-MC 094a1	0.104	0.65	0.102	< 0.1	< 0.01	< 0.5	< 0.05	< 5	< 0.1	< 0.05	0.06
17RAY-MC 094b1	0.099	0.67	0.100	0.1	< 0.01	< 0.5	< 0.05	< 5	< 0.1	< 0.05	0.04
17RAY-MC 095a1	0.117	0.76	0.121	0.1	< 0.01	< 0.5	< 0.05	< 5	< 0.1	< 0.05	< 0.01
17RAY-MC 096a1	0.202	1.45	0.240	1.5	0.42	0.8	0.12	6	0.1	4.47	0.98
17RAY-MC 096b1	0.045	0.27	0.039	1.6	0.11	< 0.5	0.26	7	< 0.1	1.73	0.79
17RAY-MC 097b1	0.320	2.00	0.311	0.4	0.08	2.3	< 0.05	5	< 0.1	1.19	1.75
17RAY-MC 098a1	0.072	0.43	0.062	0.3	< 0.01	0.7	0.21	< 5	< 0.1	< 0.05	0.14
17RAY-MC 099b1	0.232	1.72	0.278	2.2	0.43	< 0.5	< 0.05	< 5	< 0.1	2.81	1.14
17RAY-MC 101b2	0.044	0.27	0.040	0.2	0.02	< 0.5	< 0.05	< 5	< 0.1	0.07	0.06
17RAY-MC 103a1	0.249	1.70	0.269	2.0	0.40	1.2	< 0.05	< 5	0.1	2.50	1.23
17RAY-MC 103b1	0.212	1.56	0.263	2.4	0.51	< 0.5	< 0.05	< 5	< 0.1	3.57	1.88
17RAY-MC 103c1	0.121	0.82	0.127	1.2	0.26	< 0.5	< 0.05	< 5	< 0.1	1.21	0.47
17RAY-MC 105a1	0.093	0.61	0.092	0.7	0.11	< 0.5	< 0.05	< 5	< 0.1	0.63	0.23
17RAY-MC 105b1	0.187	1.41	0.241	2.4	0.63	6.0	< 0.05	< 5	< 0.1	3.96	1.76
17RAY-MC 109a1	0.130	0.78	0.120	0.3	< 0.01	9.9	< 0.05	< 5	< 0.1	< 0.05	0.02
17RAY-MC 112b2	0.271	1.79	0.284	1.7	0.52	< 0.5	< 0.05	5	< 0.1	1.06	0.53
17RAY-MC 113a1	0.284	1.82	0.278	1.3	0.12	< 0.5	< 0.05	< 5	< 0.1	0.81	0.49
17RAY-MC 119a1	< 0.005	0.03	0.003	< 0.1	< 0.01	< 0.5	< 0.05	< 5	< 0.1	< 0.05	< 0.01
17RAY-MC 123a	0.268	1.71	0.252	1.6	0.11	< 0.5	< 0.05	< 5	< 0.1	1.48	0.87
17RAY-MC 124a	0.270	1.85	0.266	1.3	0.12	< 0.5	< 0.05	< 5	< 0.1	1.26	0.66
17RAY-MC 124b	0.296	1.89	0.311	1.8	0.20	< 0.5	< 0.05	< 5	< 0.1	1.15	0.74
17RAY-MC 125a	0.255	1.67	0.248	1.3	0.12	< 0.5	< 0.05	< 5	< 0.1	1.15	1.35
17RAY-MC 125d	0.236	1.55	0.246	1.2	0.11	< 0.5	< 0.05	< 5	< 0.1	0.80	0.58
17RAY-MC 126a	0.189	1.23	0.187	1.1	0.19	24.4	< 0.05	< 5	< 0.1	0.65	0.35
17RAY-MC 129a	0.262	1.69	0.274	1.4	0.12	< 0.5	0.06	< 5	< 0.1	1.42	0.94
17RAY-MC 132d	0.035	0.22	0.035	< 0.1	< 0.01	< 0.5	< 0.05	< 5	< 0.1	< 0.05	0.04

Analyte Symbol	Tm	Yb	Lu	Hf	Ta	W	Tl	Pb	Bi	Th	U
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.005	0.01	0.002	0.1	0.01	0.5	0.05	5	0.1	0.05	0.01
Method Code	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
17RAY-MC 133a	< 0.005	0.05	< 0.002	< 0.1	0.04	1.6	< 0.05	< 5	< 0.1	< 0.05	0.01
17RAY-MC 135b	0.040	0.26	0.039	< 0.1	0.02	< 0.5	< 0.05	< 5	< 0.1	< 0.05	0.03
17RAY-MC 135c	0.028	0.19	0.029	< 0.1	< 0.01	< 0.5	< 0.05	< 5	< 0.1	< 0.05	0.07
17RAY-MC 136a	0.095	0.62	0.102	0.3	< 0.01	< 0.5	< 0.05	< 5	< 0.1	< 0.05	< 0.01
17RAY-MC 137a	0.221	1.40	0.214	1.0	0.09	< 0.5	< 0.05	< 5	< 0.1	0.81	0.56
17RAY-MC 018a1	0.433	2.78	0.420	3.7	3.17	< 0.5	< 0.05	< 5	< 0.1	4.15	1.21
17RAY-MC 018b2	0.443	2.85	0.429	3.6	3.02	< 0.5	< 0.05	< 5	< 0.1	4.03	1.09
17RAY-MC 019b2	0.047	0.31	0.047	1.4	0.11	10.8	< 0.05	< 5	< 0.1	1.19	0.85
17RAY-MC 020a1	0.429	2.87	0.410	9.2	6.49	1.3	< 0.05	7	< 0.1	11.5	2.19
17RAY-MC 021a1	0.011	0.07	0.012	< 0.1	< 0.01	3.5	< 0.05	< 5	0.2	< 0.05	< 0.01
17RAY-MC 021b1	0.300	2.20	0.336	2.1	0.85	0.7	1.00	21	0.3	20.4	5.47
17RAY-MC 021c1	0.520	3.45	0.502	2.8	0.39	4.0	< 0.05	5	< 0.1	0.89	0.41
17RAY-MC 021d1	0.536	3.40	0.539	11.6	10.7	3.3	0.39	15	< 0.1	19.8	1.14
17RAY-MC 020a2	0.367	2.33	0.334	8.0	5.68	0.6	< 0.05	7	< 0.1	9.65	1.47
17RAY-MC 024a2	0.320	2.02	0.319	6.9	5.07	22.6	< 0.05	6	< 0.1	8.79	2.16
17RAY-MC 024a5	0.352	2.15	0.306	7.0	5.47	1.5	< 0.05	8	< 0.1	9.72	2.26
17RAY-MC 025b2	0.273	1.68	0.254	2.3	0.72	< 0.5	< 0.05	< 5	< 0.1	3.31	1.05
17RAY-MC 029b2	0.408	2.46	0.378	7.6	7.95	1.5	< 0.05	6	< 0.1	14.8	2.87
17RAY-MC 029b3	0.324	2.10	0.316	7.3	5.48	1.4	< 0.05	7	< 0.1	9.27	2.11
17RAY-MC 034b1	0.388	2.37	0.348	8.3	6.79	1.2	< 0.05	5	< 0.1	12.8	2.86
17RAY-MC 039a2	0.245	1.55	0.231	3.1	2.45	0.8	< 0.05	< 5	< 0.1	3.78	1.06
17RAY-MC 039b2	0.305	1.99	0.300	3.8	2.84	0.7	< 0.05	6	< 0.1	4.50	1.04
17RAY-MC 039c2	0.273	1.66	0.243	3.3	2.60	< 0.5	< 0.05	< 5	2.7	4.07	0.26
17RAY-MC 042a1	0.311	1.91	0.271	4.6	3.18	1.2	< 0.05	< 5	< 0.1	4.59	1.34
17RAY-MC 045a1	0.288	1.74	0.264	3.6	2.45	1.2	< 0.05	< 5	< 0.1	3.54	0.98
17RAY-MC 049a2	0.305	1.93	0.297	4.0	2.46	1.2	< 0.05	< 5	< 0.1	3.45	0.99
17RAY-MC 050a2	0.580	3.81	0.588	7.5	4.63	1.9	< 0.05	5	< 0.1	7.88	2.26
17RAY-MC 138a	0.084	0.50	0.071	0.2	0.01	< 0.5	< 0.05	< 5	< 0.1	< 0.05	0.01
17RAY-MC 140a	0.006	0.03	0.005	< 0.1	0.03	< 0.5	< 0.05	< 5	< 0.1	0.07	0.06
17RAY-MC 143a	0.245	1.58	0.242	1.6	0.17	1.2	< 0.05	< 5	< 0.1	1.06	0.75
17RAY-MC 143b	0.229	1.49	0.227	1.4	0.15	3.0	< 0.05	< 5	< 0.1	1.04	0.69
17RAY-MC 143c	0.307	2.05	0.308	1.9	0.21	< 0.5	< 0.05	7	< 0.1	2.04	1.55
17RAY-MC 148a	0.184	1.28	0.206	1.1	0.23	2.3	< 0.05	< 5	< 0.1	1.14	0.66
17RAY-MC 148b	0.073	0.45	0.065	0.3	< 0.01	0.7	< 0.05	< 5	< 0.1	0.05	0.82
17RAY-MC 148b4	0.119	0.72	0.109	0.5	0.05	0.9	< 0.05	5	< 0.1	0.13	0.22
17RAY-MC 149a	0.561	3.71	0.561	2.2	0.21	< 0.5	2.07	< 5	< 0.1	1.23	4.47
17RAY-MC 151a	0.039	0.30	0.044	0.3	0.09	< 0.5	0.12	< 5	< 0.1	0.68	0.23
17RAY-MC 153a	0.056	0.39	0.061	0.3	0.06	< 0.5	< 0.05	< 5	< 0.1	0.94	0.34
17RAY-MC 156a	0.063	0.43	0.071	0.6	0.11	< 0.5	< 0.05	< 5	< 0.1	1.20	0.52
17RAY-MC 157a	0.136	1.00	0.162	1.0	0.26	< 0.5	0.30	< 5	< 0.1	3.38	0.62
17RAY-MC 158a	0.062	0.42	0.067	0.5	0.14	1.7	< 0.05	< 5	< 0.1	1.38	0.57
17RAY-MC 144a	0.454	3.10	0.474	3.1	0.35	0.7	< 0.05	< 5	< 0.1	0.61	0.32

Analyte Symbol	Tm	Yb	Lu	Hf	Ta	W	Tl	Pb	Bi	Th	U
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.005	0.01	0.002	0.1	0.01	0.5	0.05	5	0.1	0.05	0.01
Method Code	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
17RAY-MC 146a	0.266	1.77	0.281	1.3	0.06	3.0	< 0.05	< 5	< 0.1	0.98	0.72
17RAY-MC 147a	0.281	1.92	0.304	1.9	0.53	1.1	0.05	< 5	< 0.1	1.69	0.82
17RAY-MC 154a	0.084	0.57	0.099	0.7	0.18	< 0.5	0.06	< 5	0.2	1.78	0.39
17RAY-MC 157b	0.117	0.82	0.133	1.1	0.28	0.8	0.15	< 5	< 0.1	3.12	0.60
17RAY-MC 159a	0.099	0.62	0.116	2.3	0.30	< 0.5	< 0.05	6	< 0.1	3.08	1.01
17RAY-MC 160b	0.126	0.82	0.145	1.3	0.33	0.9	0.09	< 5	< 0.1	3.06	1.22
17RAY-MC 163a	0.192	1.30	0.210	1.5	0.12	< 0.5	< 0.05	< 5	< 0.1	0.77	0.51
17RAY-MC 163b	< 0.005	0.05	0.006	< 0.1	0.01	0.5	< 0.05	< 5	< 0.1	0.11	0.11
17RAY-MC 165b1	0.215	1.37	0.217	1.7	0.39	1.3	< 0.05	< 5	< 0.1	0.29	0.14
17RAY-MC 168a	0.040	0.27	0.042	0.4	0.05	< 0.5	< 0.05	< 5	< 0.1	0.60	0.17
17RAY-MC 171a	0.078	0.53	0.089	0.8	0.19	0.9	< 0.05	< 5	< 0.1	1.76	0.81
17RAY-MC 171b	0.225	1.57	0.253	2.1	0.61	3.3	0.31	< 5	< 0.1	6.32	1.17
17RAY-MC 173a	0.069	0.48	0.080	0.4	0.10	< 0.5	< 0.05	< 5	< 0.1	0.98	0.31
17RAY-MC 175a	0.091	0.59	0.092	0.7	0.19	< 0.5	< 0.05	< 5	< 0.1	2.09	0.76
17RAY-MC 176a	0.296	2.05	0.329	1.6	0.45	0.9	0.34	< 5	< 0.1	5.84	1.84
17RAY-MC 179a	0.185	1.33	0.210	1.1	0.20	< 0.5	< 0.05	< 5	< 0.1	1.42	1.01
17RAY-MC 179b	0.178	1.21	0.208	1.2	0.13	< 0.5	< 0.05	< 5	< 0.1	0.83	0.68
17RAY-MC 182a	0.041	0.31	0.051	0.5	0.10	1.4	< 0.05	< 5	< 0.1	1.06	0.65
17RAY-MC 186b	0.037	0.24	0.035	0.3	0.07	< 0.5	< 0.05	< 5	< 0.1	1.06	0.35
17RAY-MC 192a	0.249	1.75	0.280	2.9	0.52	3.0	0.20	5	< 0.1	6.84	0.98
17RAY-MC 200c	0.471	2.85	0.411	7.5	3.93	5.4	< 0.05	< 5	< 0.1	4.72	1.37
17RAY-MC 214a	0.188	1.18	0.187	1.3	0.35	1.6	< 0.05	< 5	< 0.1	0.27	0.70
17RAY-MC 220a	0.098	0.62	0.095	0.8	0.21	< 0.5	< 0.05	148	0.2	2.08	0.44
17RAY-MC 215a	0.133	0.88	0.141	0.6	0.17	< 0.5	< 0.05	< 5	< 0.1	1.88	0.76
17RAY-MC 223b	0.211	1.35	0.224	1.8	0.11	< 0.5	< 0.05	6	< 0.1	0.72	0.66
17RAY-MC 233b	0.192	1.40	0.228	2.1	0.24	0.7	0.38	7	< 0.1	2.14	1.29
17RAY-MC 233c	0.104	0.73	0.115	1.3	0.27	< 0.5	0.17	6	< 0.1	3.05	1.15
17RAY-MC 235a	0.040	0.27	0.042	0.4	0.12	< 0.5	< 0.05	< 5	< 0.1	0.94	0.35
17RAY-MC 236a	0.355	2.15	0.313	5.9	3.06	< 0.5	< 0.05	< 5	< 0.1	3.87	1.26
17RAY-MC 243a	0.074	0.50	0.084	0.6	0.14	1.5	< 0.05	< 5	0.1	1.10	0.44
17RAY-MC 245a	0.155	1.07	0.173	1.2	0.27	< 0.5	0.16	< 5	< 0.1	3.69	1.12
17RAY-MC 245b	0.049	0.32	0.052	0.3	0.10	< 0.5	< 0.05	< 5	< 0.1	1.03	1.55
17RAY-MC 249a	0.113	0.79	0.127	0.8	0.19	1.8	< 0.05	7	< 0.1	2.06	0.96
17RAY-MC 250b	0.243	1.48	0.229	3.7	1.63	< 0.5	< 0.05	10	< 0.1	9.39	3.94
17RAY-MC 256a	0.021	0.14	0.021	0.3	0.06	< 0.5	< 0.05	< 5	< 0.1	0.58	0.19
17RAY-MC 258a	0.068	0.45	0.069	0.7	0.15	< 0.5	< 0.05	< 5	< 0.1	1.55	0.59
17RAY-MC 083a3 Missing											
15ZE 1195	0.257	1.57	0.229	5.2	2.56	1.1	< 0.05	6	< 0.1	3.51	0.50
16ZE 1264	0.384	2.50	0.375	4.7	0.83	15.7	< 0.05	8	< 0.1	8.47	2.84
16ZE 1298	0.069	0.46	0.072	0.2	0.03	< 0.5	0.34	< 5	< 0.1	0.06	0.04
16ZE 1331a	0.439	2.63	0.413	8.6	5.21	0.8	< 0.05	< 5	< 0.1	7.78	1.75

Analyte Symbol	Tm	Yb	Lu	Hf	Ta	W	Tl	Pb	Bi	Th	U
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.005	0.01	0.002	0.1	0.01	0.5	0.05	5	0.1	0.05	0.01
Method Code	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
16ZE 1333	0.529	3.86	0.637	2.7	0.79	< 0.5	< 0.05	< 5	< 0.1	1.25	0.76
17RAY-MC 102b1	0.160	1.10	0.179	1.4	0.26	6.0	< 0.05	< 5	< 0.1	1.18	0.43
17-RAY-MC 82(light colour)	0.321	1.99	0.308	7.7	6.16	1.4	< 0.05	< 5	< 0.1	12.2	5.91

Analyte Symbol	SiO2	Al2O3	Fe2O3(T)	MnO	MgO	CaO	Na2O	K2O	TiO2	P2O5	LOI	Total	Sc	Be	V	Cr	Co	Ni	Cu	Zn	Ga	Ge	As
Unit Symbol	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.01	0.01	0.01	0.001	0.01	0.01	0.01	0.01	0.001	0.01		0.01	1	1	5	20	1	20	10	30	1	0.5	5
Method Code	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
NIST 694 Meas	11.29	1.80	0.75	0.010	0.35	42.79	0.89	0.54	0.120	30.23					1596								
NIST 694 Cert	11.2	1.80	0.790	0.0116	0.330	43.6	0.860	0.510	0.110	30.2					1740								
DNC-1 Meas	47.23	18.27	10.01	0.150	10.48	11.51	1.92	0.23	0.490	0.07			31		152	270	54	240	90				
DNC-1 Cert	47.15	18.34	9.97	0.150	10.13	11.49	1.890	0.234	0.480	0.070			31		148	270	57	247	100				
LKSD-3 Meas																90	28	50					27
LKSD-3 Cert																87.0	30.0	47.0					27.0
TDB-1 Meas																250			340	140			
TDB-1 Cert																251			323	155			
W-2a Meas	52.66	15.54	10.75	0.170	6.41	11.09	2.22	0.62	1.090	0.13			36	< 1	268	90	43		110	80	18	1.6	
W-2a Cert	52.4	15.4	10.7	0.163	6.37	10.9	2.14	0.626	1.06	0.130			36.0	1.30	262	92.0	43.0		110	80.0	17.0	1.00	
SY-4 Meas	49.91	20.52	6.28	0.110	0.51	8.05	6.92	1.65	0.290	0.12			1	3	6								
SY-4 Cert	49.9	20.69	6.21	0.108	0.54	8.05	7.10	1.66	0.287	0.131			1.1	2.6	8.0								
CTA-AC-1 Meas																			50	40			
CTA-AC-1 Cert																			54.0	38.0			
BIR-1a Meas	48.30	15.63	11.19	0.170	10.04	13.62	1.84	0.02	0.960	0.01			43	< 1	328	370	50	170	120	70	15		
BIR-1a Cert	47.96	15.50	11.30	0.175	9.700	13.30	1.82	0.030	0.96	0.021			44	0.58	310	370	52	170	125	70	16		
NCS DC86312 Meas																							
NCS DC86312 Cert																							
NCS DC70009 (GBW07241) Meas																30			890	90	16	10.5	68
NCS DC70009 (GBW07241) Cert																30			960	100	16.5	11.2	69.9
OREAS 100a (Fusion) Meas																	20		170				
OREAS 100a (Fusion) Cert																	18.1		169				
OREAS 101a (Fusion) Meas																	53		440				
OREAS 101a (Fusion) Cert																	48.8		430				
OREAS 101b (Fusion) Meas																	45		430				
OREAS 101b (Fusion) Cert																	47		420				
JR-1 Meas																		< 20		30	16	2.1	17
JR-1 Cert																		1.67		30.6	16.1	1.88	16.3
17RAY-MC 082b1 Orig	14.71	5.99	6.02	0.128	2.68	37.09	0.04	0.37	1.013	0.34	31.04	99.42	7	1	69	40	12	20	20	50	10	< 0.5	< 5
17RAY-MC 082b1 Dup	14.53	5.80	5.87	0.127	2.66	36.94	0.04	0.37	1.010	0.34	31.04	98.74	7	1	69	40	12	20	20	40	9	< 0.5	< 5

Analyte Symbol	SiO2	Al2O3	Fe2O3(T)	MnO	MgO	CaO	Na2O	K2O	TiO2	P2O5	LOI	Total	Sc	Be	V	Cr	Co	Ni	Cu	Zn	Ga	Ge	As
Unit Symbol	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.01	0.01	0.01	0.001	0.01	0.01	0.01	0.01	0.001	0.01		0.01	1	1	5	20	1	20	10	30	1	0.5	5
Method Code	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
17RAY-MC 113a1 Orig	44.12	16.03	11.73	0.168	9.53	8.24	2.48	1.31	0.989	0.25	5.36	100.2	52	< 1	393	280	44	130	110	140	16	1.6	< 5
17RAY-MC 113a1 Dup	43.90	15.78	11.57	0.168	9.54	8.20	2.45	1.30	0.968	0.25	5.36	99.50	52	< 1	390	280	43	130	110	90	16	1.5	< 5
17RAY-MC 019b2 Orig	66.53	15.85	1.76	0.028	1.04	2.71	4.58	2.98	0.222	0.05	3.20	98.96	4	< 1	35	20	4	< 20	< 10	< 30	16	0.8	< 5
17RAY-MC 019b2 Split PREP DUP	66.80	15.76	1.78	0.028	1.02	2.68	4.49	2.94	0.220	0.07	3.19	98.98	4	< 1	35	< 20	4	< 20	< 10	< 30	15	0.6	< 5
17RAY-MC 039a2 Orig	45.24	15.22	8.39	0.183	9.67	10.51	2.75	0.13	1.803	0.37	4.81	99.08	33	1	241	550	40	150	150	60	15	1.4	< 5
17RAY-MC 039a2 Dup	45.77	15.52	8.50	0.182	9.67	10.58	2.79	0.13	1.869	0.37	4.81	100.2	33	1	244	580	41	160	160	50	16	1.6	< 5
17RAY-MC 153a Orig	94.75	2.09	1.16	0.011	0.41	0.12	0.26	0.47	0.085	< 0.01	0.46	99.82	4	< 1	19	< 20	2	< 20	60	< 30	4	1.2	< 5
17RAY-MC 153a Dup	93.94	2.10	1.15	0.011	0.41	0.12	0.25	0.48	0.086	< 0.01	0.46	98.99	4	< 1	17	< 20	2	< 20	70	< 30	4	1.3	< 5
17RAY-MC 233c Orig	84.02	7.20	2.69	0.017	1.22	0.04	0.34	1.78	0.294	0.03	2.08	99.71	10	1	79	40	2	< 20	30	50	10	1.3	< 5
17RAY-MC 233c Dup	83.43	6.93	2.69	0.018	1.21	0.04	0.34	1.77	0.300	0.03	2.08	98.84	10	1	77	40	2	< 20	30	30	10	1.5	< 5
17-RAY-MC 82(light colour) Orig	33.56	12.94	7.33	0.108	7.49	16.02	0.08	1.53	2.357	0.69	16.71	98.80	18	2	156	100	28	50	< 10	70	17	1.0	< 5
17-RAY-MC 82(light colour) Dup	33.47	12.95	7.22	0.106	7.61	15.93	0.08	1.52	2.331	0.69	16.71	98.61	17	2	155	90	28	50	< 10	70	16	1.1	< 5
Method Blank	< 0.01	< 0.01	0.01	0.002	< 0.01	< 0.01	< 0.01	< 0.01	< 0.001	< 0.01			< 1	< 1	< 5	< 20	< 1	< 20	< 10	< 30	< 1	< 0.5	< 5
Method Blank	< 0.01	< 0.01	0.01	0.002	0.01	< 0.01	< 0.01	< 0.01	< 0.001	< 0.01			< 1	< 1	< 5								
Method Blank	< 0.01	< 0.01	0.01	0.002	< 0.01	< 0.01	< 0.01	< 0.01	< 0.001	< 0.01			< 1	< 1	< 5								

Analyte Symbol	Rb	Sr	Y	Zr	Nb	Mo	Ag	In	Sn	Sb	Cs	Ba	La	Ce	Pr	Nd	Sm	Gd	Tb	Ho	Er	Yb	Hf			
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm			
Lower Limit	1	2	0.5	1	0.2	2	0.5	0.1	1	0.2	0.1	2	0.05	0.05	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.1			
Method Code	FUS-MS	FUS-ICP	FUS-MS	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS			
NIST 694 Meas																										
NIST 694 Cert																										
DNC-1 Meas		144	16.0	38						0.9		108	3.60			4.70							1.90			
DNC-1 Cert		144.0	18.0	38						0.96		118	3.6			5.20							2.0			
LKSD-3 Meas	80					< 2	2.6		2		2.2		47.6	87.6		42.0	7.40		0.90				2.80	4.9		
LKSD-3 Cert	78.0					2.00	2.70		3.00		2.30		52.0	90.0		44.0	8.00		1.00					2.70	4.80	
TDB-1 Meas			34.5										17.0	39.8		24.0								3.20		
TDB-1 Cert			36										17	41		23									3.4	
W-2a Meas	19	194	21.4	93	7.4	< 2						176		23.7		12.8	3.30		0.61	0.78				2.10	2.4	
W-2a Cert	21.0	190	24.0	94.0	7.90	0.600						182		23.0		13.0	3.30		0.630	0.760					2.10	2.60
SY-4 Meas		1202		536								343														
SY-4 Cert		1191		517								340														
CTA-AC-1 Meas			280										> 2000	> 3000		1110	155	123	13.3					11.3	1.2	
CTA-AC-1 Cert			272										2176	3326		1087	162	124	13.9						11.4	1.13
BIR-1a Meas		113	15.0	15						0.6		8	0.70	1.90		2.30	1.00	1.80							1.60	
BIR-1a Cert		110	16	18						0.58		6	0.63	1.9		2.5	1.1	2.0								1.7
NCS DC86312 Meas			992										> 2000	174		1540		230	35.8	34.1	99.0	83.7				
NCS DC86312 Cert			976										2360	190		1600		225.0	34.6	36	96.2	87.79				
NCS DC70009 (GBW07241) Meas	495		126				2.0	1.0	> 1000	3.4	37.1		23.6	59.1	7.90	31.2	12.2	14.4	3.50	4.20	13.0	15.2				
NCS DC70009 (GBW07241) Cert	500		128				1.8	1.3	1700	3.1	41		23.7	60.3	7.9	32.9	12.5	14.8	3.3	4.5	13.4	14.9				
OREAS 100a (Fusion) Meas			134			22							253	456	45.1	145	23.0	22.6	3.90	4.64	14.7	14.1				
OREAS 100a (Fusion) Cert			142			24.1							260	463	47.1	152	23.6	23.6	3.80	4.81	14.9	14.9				
OREAS 101a (Fusion) Meas			167			21							769	1290	122	371	45.3	43.1	5.60	6.19	18.6	16.8				
OREAS 101a (Fusion) Cert			183			21.9							816	1396	134	403	48.8	43.4	5.92	6.46	19.5	17.5				
OREAS 101b (Fusion) Meas			182			20							815	1380	128	381	50.0		5.06	6.36	19.0	17.8				
OREAS 101b (Fusion) Cert			178			21							789	1331	127	378	48		5.37	6.34	18.7	17.6				
JR-1 Meas	248		46.5		14.3	4		< 0.1	3	1.1	20.8		19.8	46.2	5.90	22.9	5.57	5.40	1.00	1.17	3.52	4.55	4.2			
JR-1 Cert	257		45.1		15.2	3.25		0.028	2.86	1.19	20.8		19.7	47.2	5.58	23.3	6.03	5.06	1.01	1.11	3.61	4.55	4.51			
17RAY-MC 082b1 Orig	5	312	31.9	180	41.3	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	119	38.6	77.4	7.90	29.4	5.55	5.75	0.86	0.83	2.08	1.52	3.5			
17RAY-MC 082b1 Dup	5	311	31.0	178	41.0	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	118	36.4	71.4	7.26	26.8	5.15	5.67	0.87	0.80	2.10	1.61	3.3			
17RAY-MC 113a1	21	310	19.0	41	1.5	< 2	< 0.5	< 0.1	< 1	0.4	0.4	371	4.25	9.98	1.51	7.42	2.56	3.32	0.57	0.68	1.90	1.82	1.3			

Analyte Symbol	Rb	Sr	Y	Zr	Nb	Mo	Ag	In	Sn	Sb	Cs	Ba	La	Ce	Pr	Nd	Sm	Gd	Tb	Ho	Er	Yb	Hf
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	1	2	0.5	1	0.2	2	0.5	0.1	1	0.2	0.1	2	0.05	0.05	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.1
Method Code	FUS-MS	FUS-ICP	FUS-MS	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-ICP	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
Orig																							
17RAY-MC 113a1 Dup	21	301	18.9	41	1.4	< 2	< 0.5	< 0.1	< 1	0.4	0.4	370	4.46	10.4	1.57	7.52	2.58	3.20	0.58	0.71	1.88	1.81	1.2
17RAY-MC 019b2 Orig	61	154	3.7	52	1.0	< 2	< 0.5	< 0.1	< 1	< 0.2	1.2	980	5.11	9.62	1.07	4.88	0.96	0.88	0.13	0.12	0.32	0.31	1.4
17RAY-MC 019b2 Split PREP DUP	61	149	3.8	56	1.1	< 2	< 0.5	< 0.1	< 1	< 0.2	1.2	966	5.11	9.44	1.01	4.32	0.86	0.84	0.14	0.13	0.33	0.29	1.6
17RAY-MC 039a2 Orig	2	320	18.1	149	32.7	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	74	31.4	60.8	6.60	24.8	4.76	4.29	0.67	0.65	1.76	1.52	2.9
17RAY-MC 039a2 Dup	2	323	18.4	152	34.1	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	76	33.2	62.8	6.83	25.8	5.09	4.42	0.70	0.66	1.80	1.58	3.2
17RAY-MC 153a Orig	17	17	3.7	18	1.1	< 2	< 0.5	< 0.1	< 1	< 0.2	0.9	478	3.30	8.22	0.83	3.32	0.67	0.64	0.11	0.12	0.35	0.40	0.3
17RAY-MC 153a Dup	18	17	3.7	19	1.2	< 2	< 0.5	< 0.1	< 1	< 0.2	1.0	479	3.28	8.16	0.84	3.05	0.69	0.69	0.11	0.12	0.35	0.38	0.3
17RAY-MC 233c Orig	63	18	5.7	53	2.8	< 2	< 0.5	< 0.1	< 1	0.2	2.6	1177	8.87	18.9	1.98	7.63	1.57	1.09	0.16	0.21	0.64	0.73	1.2
17RAY-MC 233c Dup	64	18	5.8	52	3.3	< 2	< 0.5	< 0.1	1	1.1	2.7	1173	9.19	19.2	2.02	7.94	1.43	1.01	0.15	0.20	0.62	0.72	1.4
17-RAY-MC 82(light colour) Orig	29	331	24.0	407	102	< 2	1.0	< 0.1	2	0.5	0.4	973	68.7	128	13.4	49.5	8.58	6.00	0.84	0.87	2.39	1.96	7.5
17-RAY-MC 82(light colour) Dup	29	337	23.7	408	101	< 2	1.0	< 0.1	2	< 0.2	0.4	970	68.9	127	13.4	48.9	8.47	6.09	0.83	0.81	2.24	2.02	7.8
Method Blank	< 1	< 2	< 0.5	< 1	< 0.2	< 2	< 0.5	< 0.1	< 1	< 0.2	< 0.1	< 2	< 0.05	< 0.05	< 0.01	< 0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.1
Method Blank		< 2		1								< 2											
Method Blank		< 2		2								< 2											

Analyte Symbol	W	Tl	Pb	Bi	Th	U	Eu	Dy	Tm	Lu	Ta
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.5	0.05	5	0.1	0.05	0.01	0.005	0.01	0.005	0.002	0.01
Method Code	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
NIST 694 Meas											
NIST 694 Cert											
DNC-1 Meas							0.610				
DNC-1 Cert							0.59				
LKSD-3 Meas					10.8	4.50	1.40	4.70		0.370	0.72
LKSD-3 Cert					11.4	4.60	1.50	4.90		0.400	0.700
TDB-1 Meas					2.50		2.00				
TDB-1 Cert					2.7		2.1				
W-2a Meas	< 0.5	< 0.05	8	< 0.1	2.20	0.52		3.90		0.310	
W-2a Cert	0.300	0.200	9.30	0.0300	2.40	0.530		3.60		0.330	
SY-4 Meas											
SY-4 Cert											
CTA-AC-1 Meas					22.1	4.20	44.4			1.16	2.54
CTA-AC-1 Cert					21.8	4.4	46.7			1.08	2.65
BIR-1a Meas			5				0.510	3.60			
BIR-1a Cert			3				0.55	4			
NCS DC86312 Meas					23.3			188	13.3	11.9	
NCS DC86312 Cert					23.6			183	15.1	11.96	
NCS DC70009 (GBW07241) Meas	2140	1.86			29.3			21.4	2.20	2.20	
NCS DC70009 (GBW07241) Cert	2200	1.8			28.3			20.7	2.2	2.4	
OREAS 100a (Fusion) Meas					51.8	142	3.49	23.7	2.22	2.05	
OREAS 100a (Fusion) Cert					51.6	135	3.71	23.2	2.31	2.26	
OREAS 101a (Fusion) Meas					34.5	418	7.63	31.4	2.80	2.42	
OREAS 101a (Fusion) Cert					36.6	422	8.06	33.3	2.90	2.66	
OREAS 101b (Fusion) Meas					36.3	407	8.05	32.3	2.77	2.61	
OREAS 101b (Fusion) Cert					37.1	396	7.77	32.1	2.66	2.58	
JR-1 Meas		1.47	21	0.6	27.6	9.20	0.270	5.54	0.650	0.670	1.88
JR-1 Cert		1.56	19.3	0.56	26.7	8.88	0.30	5.69	0.67	0.71	1.86
17RAY-MC 082b1 Orig	< 0.5	< 0.05	< 5	< 0.1	5.54	1.04	1.90	4.43	0.262	0.221	2.62
17RAY-MC 082b1 Dup	< 0.5	< 0.05	< 5	< 0.1	5.52	1.01	1.85	4.49	0.270	0.224	2.56
17RAY-MC 113a1	< 0.5	< 0.05	< 5	< 0.1	0.79	0.47	0.690	3.48	0.284	0.281	0.13

Analyte Symbol	W	Tl	Pb	Bi	Th	U	Eu	Dy	Tm	Lu	Ta
Unit Symbol	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Lower Limit	0.5	0.05	5	0.1	0.05	0.01	0.005	0.01	0.005	0.002	0.01
Method Code	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS	FUS-MS
Orig											
17RAY-MC 113a1 Dup	< 0.5	< 0.05	< 5	< 0.1	0.82	0.51	0.710	3.59	0.284	0.275	0.11
17RAY-MC 019b2 Orig	10.8	< 0.05	< 5	< 0.1	1.19	0.85	0.317	0.70	0.047	0.047	0.11
17RAY-MC 019b2 Split PREP DUP	0.5	< 0.05	< 5	< 0.1	1.21	0.77	0.306	0.77	0.044	0.045	0.08
17RAY-MC 039a2 Orig	0.8	< 0.05	< 5	< 0.1	3.72	1.06	1.64	3.72	0.250	0.227	2.40
17RAY-MC 039a2 Dup	0.8	< 0.05	< 5	< 0.1	3.85	1.06	1.68	3.77	0.240	0.236	2.49
17RAY-MC 153a Orig	< 0.5	0.08	< 5	< 0.1	0.96	0.34	0.150	0.62	0.055	0.063	0.05
17RAY-MC 153a Dup	< 0.5	< 0.05	< 5	< 0.1	0.92	0.34	0.145	0.66	0.057	0.059	0.08
17RAY-MC 233c Orig	< 0.5	0.16	5	< 0.1	3.00	1.14	0.297	0.95	0.103	0.118	0.26
17RAY-MC 233c Dup	8.5	0.19	6	< 0.1	3.11	1.16	0.310	0.88	0.106	0.111	0.29
17-RAY-MC 82(light colour) Orig	2.1	< 0.05	8	< 0.1	12.4	5.97	2.45	4.55	0.328	0.306	6.17
17-RAY-MC 82(light colour) Dup	0.7	< 0.05	< 5	< 0.1	12.1	5.86	2.41	4.31	0.314	0.311	6.15
Method Blank	< 0.5	< 0.05	< 5	< 0.1	< 0.05	< 0.01	< 0.005	< 0.01	< 0.005	< 0.002	< 0.01
Method Blank											
Method Blank											