



**GEOCHEMICAL DATA FROM HIGH-GRADE IRON-
ORE OCCURRENCES IN THE EASTERN LABRADOR
TROUGH (NTS MAP AREAS 23I AND 23J)**

**J. Conliffe
Mineral Deposits**

Open File LAB/1646

**St. John's
Newfoundland and Labrador
June, 2015**

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SUMMARY

This Open File release consists of whole-rock geochemical data from high-grade (> 55% Fe) iron-ore occurrences, and associated rocks from the eastern Labrador Trough, Labrador (NTS 23J and 23I, Figure 1), and forms part of a multiyear study investigating the genesis of these deposits (Conliffe, 2014, 2015). The eastern Labrador Trough is host to a number of significant high-grade iron-ore deposits, including the Joyce Lake Deposit (24.3 million tonnes at 58.6% Fe; Duplessis, 2014), the Houston Deposit (30.1 million tonnes at 57.7% Fe; Dup  r   and Taylor, 2013) and the Sawyer Lake Deposit, as well as numerous other occurrences of enriched and leached iron formation. More detailed information on the regional geological setting, geological characteristics of each deposit and a preliminary interpretation of the geochemical data are found in Conliffe (2015).

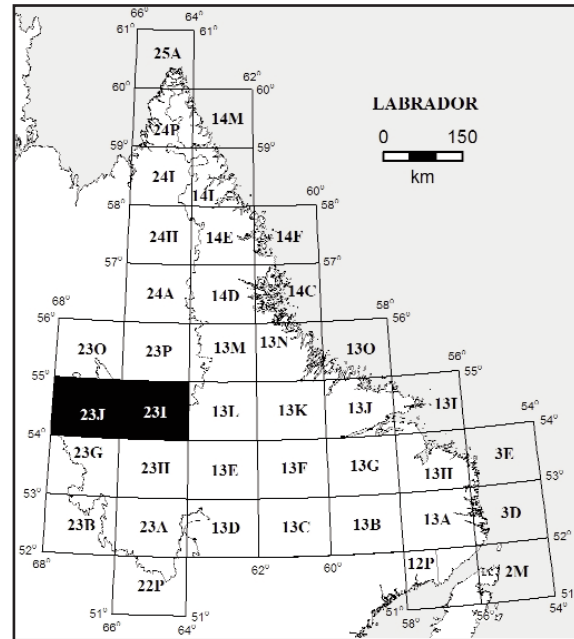


Figure 1. *Index map of study area.*

NOTES ON DATABASE

This database includes the results of whole-rock, trace-element and rare-earth element (REE) analysis of 45 outcrop samples, 29 drillcore samples and 65 drill-cutting samples collected in 2012, 2013 and 2014. Also included are the sample location data and a brief sample description. The location data for outcrop samples are presented in Universal Transverse Mercator (UTM) eastings and northings (zone 19; NAD27). The location of drillcore and drill-cutting samples represents the collar location (Appendix B), with UTM coordinates based on zones 19 and 20 (NAD27).

All analyses were carried out at the GSNL Geochemistry Laboratory in St. John's and analytical methods are described in Table 1. Samples were milled using ceramic and tungsten carbide mills, and due to possible contaminations from the tungsten carbide mill, W and Co values are not reported for samples from 2013 and 2014. Major elements are reported in weight percent (wt. %), and trace elements are reported in parts per million (ppm). Major-element compositions were analyzed by ICP-OES methods, following lithium tetraborate and metaborate fusion. REE and selected trace elements were determined by ICP-MS analysis following an identical sample digestion procedure, whereas other trace elements (As, Be, Cu, Li, Mn, Ni, Pb, Rb, Sc, Ti, Zn) were analyzed by ICP-MS after total acid digestion. Volatiles are represented as LOI (loss-on-ignition). The mass percent of Fe in each sample was calculated from the total Fe₂O₃ values, using the conversion factor of 100 wt. % Fe₂O₃ to 69.95 wt. % Fe.

Analytical duplicates were inserted at a frequency of one in 20, with the duplicate selected at random. In addition, a selection of reference standards was analyzed, also at a frequency of one

Table 1: Analytical methods for geochemical analysis

Analysis	Method	Preparation/Digestion
SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , MgO, CaO, Na ₂ O, K ₂ O, TiO ₂ , MnO, P ₂ O ₅ , Cr, Zr, Ba	Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES-FUS)	50-50 Lithium Tetraborate Lithium Metaborate
As, Be, Cu, Li, Mn, Ni, Pb, Rb, Sc, Ti, Zn	Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES)	HF-HCl-HNO ₃ -HClO ₄ (total digestion)
V, Co, Ga, Ge, As, Sr, Y, Nb, Mo, Cd, In, Sn, Cs, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Hf, Ta, W, Tl, Bi, Th, U	Inductively Coupled Plasma Mass Spectrometry (ICP-MS-FUS)	50-50 Lithium Tetraborate Lithium Metaborate
LOI	Gravimetric (Grav)	None

in 20. ICP-OES-FUS (major-element) and ICP-MS-FUS (trace-element) standards were supplied by the Canadian Certified Reference Materials Project (SCH-1), the United States Geological Survey (AGV-1, BHVO-1, BIR-1, G-2, MAG-1, QLO-1, RGM-1, SDC-1, STM-1, W-2) and the Association Nationale de la Recherche Technique, Paris (DR-N). Two standards were used for ICP-OES-FUS (trace element) analysis, supplied by the Canadian Certified Reference Materials Project (SY-4, WGB-1). The raw, unprocessed data from duplicates and standards is included in Appendices E, F and G, and can be used by the reader to assess accuracy and precision.

If a value of -99 is reported for a given element, it was not analyzed for in the sample. All other negative numbers indicate the concentration of the specific element in the sample was below the detection limit (*e.g.*, -0.01 indicates the measured value was below half the detection limit of 0.01). Detection limits are listed for each element in Appendices A, C, D, E, F and G. For some outcrop samples, the trace-element content of Mn was above the upper detection limit (65 000 ppm), for these samples, 1 is added to the upper detection limit. However, the whole-rock MnO analysis provided a more accurate representation of the Mn content of these samples.

ACKNOWLEDGMENTS

Sample preparation and analyses were carried out under the supervision of Chris Finch of the GSNL Geochemistry Laboratory. Garrett Martin and Alex Calon provided able assistance during fieldwork and Wayne Tuttle is thanked for his excellent logistical support in Goose Bay. Century Iron Mines Corporation, Labrador Iron Mines and Champion Iron Limited are thanked for access to drillcore.

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Appendix A: Major- and trace-element data for outcrop samples

Sample_Num Method Detection Limit Unit	Lab_Num	Showing	UTMEast	UTMNorth	UTMZone	Datum	Litho_code	Mag_suscep
JC12-065	10440692	Houston	651028	6004510	19	NAD27	HG	-99
JC12-072	10440696	Sawyer Lake	695320	6037939	19	NAD27	Nimish	-99
JC12-074	10440697	Sawyer Lake	695366	6037749	19	NAD27	HG	-99
JC12-077	10440698	Jasper Mountain	672389	6039020	19	NAD27	Nimish	-99
JC12-079	10440699	Astray Lake	674579	6033608	19	NAD27	AIF	-99
JC12-080	10440701	Astray Lake	674584	6033647	19	NAD27	Nimish	-99
JC12-081	10440702	Point Lake	691564	6032745	19	NAD27	Nimish	-99
13JC059A01	10440864	Sawyer	695101	6037092	19	NAD27	LIF	310.0
13JC081A01	10440884	Malcolm	647085	6069086	19	NAD27	HG	0.80
13JC082A01	10440885	Malcolm	647024	6069148	19	NAD27	HG	0.82
13JC083A01	10440886	Houston	650421	6065300	19	NAD27	AIF	0.61
13JC083B01	10440887	Houston	650421	6065300	19	NAD27	Nimish	0.96
13JC084A01	10440888	Stewart Lake	698878	6043868	19	NAD27	Ruth	1.49
13JC085A01	10440889	Stewart Lake	698873	6043956	19	NAD27	LIF	0.374
13JC086A01	10440891	Stewart Lake	698861	6043987	19	NAD27	AIF	1.00
13JC086A02	10440892	Stewart Lake	698861	6043987	19	NAD27	AIF	0.14
13JC087A01	10440893	Stewart Lake	698908	6044160	19	NAD27	Nimish	0.51
13JC054A01	10440967	Houston	651004	6064481	19	NAD27	HG	0.58
13JC055A01	10440968	Houston	650496	6065132	19	NAD27	HG	0.71
14JC001A01	10441035	Prudhomme B	685394	6070381	19	NAD27	AIF	3.55
14JC002A01	10441036	Prudhomme B	685306	6070328	19	NAD27	AIF	1.90
14JC003A01	10441037	Prudhomme A	681855	6071259	19	NAD27	AIF	1.40
14JC007A01	10441042	Snelgrove	701027	6059830	19	NAD27	Nimish	0.60
14JC008A01	10441043	Mina Lake	697772	6050566	19	NAD27	Nimish	0.85
14JC009A01	10441044	Mina Lake	697803	6050435	19	NAD27	Nimish	0.75
14JC010A01	10441045	Ashuanipi 1	684001	6033130	19	NAD27	AIF	0.40
14JC010A02	10441046	Ashuanipi 1	684001	6033130	19	NAD27	AIF	0.45
14JC010A03	10441047	Ashuanipi 1	684001	6033130	19	NAD27	AIF	0.75
14JC011A01	10441048	Eileen Lake	677048	6038839	19	NAD27	AIF	0.25
14JC013A01	10441049	Astray	674506	6033614	19	NAD27	LIF	423.5
14JC014A01	10441051	Astray	674545	6033650	19	NAD27	AIF	221.5
14JC020A01	10441054	Houston	651328	6064304	19	NAD27	AIF	0.33
14JC021A01	10441055	Houston	651330	6064417	19	NAD27	AIF	0.60
14JC021A02	10441056	Houston	651330	6064417	19	NAD27	AIF	0.10
14JC022A01	10441057	Houston	651182	6064550	19	NAD27	AIF	0.10
14JC022A02	10441058	Houston	651182	6064550	19	NAD27	AIF	0.55
14JC023A01	10441059	Houston	650964	6064599	19	NAD27	HG	0.90
14JC024A01	10441061	Houston	651130	6064438	19	NAD27	HG	0.80
14JC024A02	10441062	Houston	651130	6064438	19	NAD27	HG	0.75
14JC025A01	10441063	Astray Road	648821	6066571	19	NAD27	AIF	0.45
14JC026A01	10441064	Astray Road	648826	6066630	19	NAD27	AIF	180.0
14JC027A01	10441065	Malcolm	647069	6069053	19	NAD27	LIF	0.10
14JC028A01	10441066	Malcolm	647082	6069091	19	NAD27	AIF	0.25
14JC029A01	10441067	Malcolm	647060	6069145	19	NAD27	HG	1.15
14JC030A01	10441068	Malcolm	647552	6068725	19	NAD27	HG	-99

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Appendix A: Major- and trace-element data for outcrop samples

Sample_Num	Description	SiO2	Al2O3	Fe2O3 Total	Fe2O3	FeO	MgO	CaO
Method		OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS
Detection Limit		0.01	0.01	0.01	0.01	0.01	0.01	0.01
Unit		%	%	%	%	%	%	%
JC12-065	Hard blue hematite ore from SW end of trench	0.79	0.30	54.56	-99.00	-99.00	-0.01	0.03
JC12-072	Green basalt from Nimish volcanics, with epidote veinlet	48.18	12.89	14.39	-99.00	-99.00	9.84	7.33
JC12-074	Massive blue hematite	0.49	0.08	97.23	-99.00	-99.00	0.03	0.02
JC12-077	Possible rhyolite/andesite, porphyritic	59.91	16.47	7.69	-99.00	-99.00	0.89	0.35
JC12-079	Astray Lake high grade ore, with jasper	29.63	0.26	66.70	-99.00	-99.00	0.21	0.03
JC12-080	Nimish basalt overlying Astray Lake	45.10	15.94	13.50	-99.00	-99.00	6.82	7.58
JC12-081	Possible rhyolite from Point Lake	59.91	15.86	8.03	-99.00	-99.00	1.19	0.55
13JC059A01	Green grey cherty iron formation with magnetite bands	67.37	0.16	24.16	-99.00	-99.00	2.95	0.04
13JC081A01	Partially enriched hematite ore with lower grade bands preserving original textures	3.65	0.06	90.80	-99.00	-99.00	-0.01	0.03
13JC082A01	Blue hematite ore with hematite veinlets and pyroclite and goethite filling vugs	0.67	0.69	67.81	-99.00	-99.00	-0.01	0.06
13JC083A01	Banded leached quartz and hematite bands with vertical veinlets of hematite	79.57	0.10	17.77	-99.00	-99.00	0.02	0.03
13JC083B01	Tuff sample	41.74	13.34	24.00	-99.00	-99.00	9.40	0.18
13JC084A01	Slaty Ruth formation with mm scale laminations	43.12	9.90	24.77	-99.00	-99.00	1.19	0.21
13JC085A01	Slaty LIF with moderate weathering	46.14	0.46	42.63	-99.00	-99.00	0.05	0.03
13JC086A01	Enriched hematite bands in altered cherty iron formation	9.17	0.20	79.70	-99.00	-99.00	0.01	0.02
13JC086A02	Cherty altered iron formation with goethite filling vugs	92.17	0.09	4.94	-99.00	-99.00	-0.01	0.03
13JC087A01	Green massive Nimish basalt	45.35	16.19	11.28	-99.00	-99.00	8.72	9.72
13JC054A01	Pure blue hematite sample taken for isotope analysis	0.55	0.29	52.64	-99.00	-99.00	0.02	0.05
13JC055A01	Blue hematite sample for isotope analysis	0.88	0.17	95.62	-99.00	-99.00	-0.01	0.02
14JC001A01	Pink cherty IF with thin hematite bands and disseminated hematite. minor hematite and quartz vein:	78.67	0.15	18.45	-99.00	-99.00	0.01	0.01
14JC002A01	Pink cherty IF with blue hematite bands and hematite quartz veir	33.63	0.05	66.31	-99.00	-99.00	0.02	0.02
14JC003A01	Pink massive IF	75.39	0.03	22.57	-99.00	-99.00	0.01	0.02
14JC007A01	Gabbro	47.35	17.05	13.42	-99.00	-99.00	5.75	9.13
14JC008A01	Fine grained green volcanic with Mn staining on fractures	56.07	9.69	22.80	-99.00	-99.00	1.93	0.12
14JC009A01	Fine grained green basalt	58.20	12.54	16.13	-99.00	-99.00	1.35	1.06
14JC010A01	Pink cherty lower grade AIF with disseminated hematite	55.16	0.05	44.99	-99.00	-99.00	-0.01	0.01
14JC010A02	Higher grade AIF with chert nodules	44.14	0.07	56.18	-99.00	-99.00	-0.01	0.01
14JC010A03	High grade AIF with disseminated quartz and chert nodules	40.59	0.06	59.68	-99.00	-99.00	0.01	0.03
14JC011A01	Leached, banded friable quartz and hematite/goethite	68.26	0.03	27.60	-99.00	-99.00	-0.01	-0.01
14JC013A01	Green tuff with magnetite band	47.38	0.21	48.47	-99.00	-99.00	3.53	0.05
14JC014A01	Enriched iron formation	50.98	0.06	48.01	-99.00	-99.00	0.04	0.02
14JC020A01	Siliceous hard bands with lesser hard hematite bands. Hematite vuggy with quartz filled vugs	50.37	0.64	48.18	-99.00	-99.00	-0.01	0.02
14JC021A01	Enriched ore with disseminated hematite	33.59	0.04	66.36	-99.00	-99.00	-0.01	0.02
14JC021A02	Banded cherty with goethite band	86.55	0.03	12.54	-99.00	-99.00	-0.01	0.02
14JC022A01	Goethite and limonite altered cherty AIF	75.93	0.18	20.97	-99.00	-99.00	0.01	-0.01
14JC022A02	Banded AIF with cherty layers, blue hematite and siliceous layers, some enrichment	55.59	0.37	43.44	-99.00	-99.00	0.03	0.03
14JC023A01	Hard blue hematite ore	0.69	0.19	98.49	-99.00	-99.00	-0.01	0.01
14JC024A01	Brecciated hard blue ore with goethite and pyroclite	3.28	0.71	81.00	-99.00	-99.00	-0.01	0.02
14JC024A02	Layered hard blue ore with minor brecciation	4.10	0.29	91.31	-99.00	-99.00	-0.01	0.02
14JC025A01	Banded AIF with hematite bands and limonite alteration	28.64	0.08	65.47	-99.00	-99.00	0.01	0.05
14JC026A01	Enriched iron formation with hematite and lesser quartz and bands of limonite stained cher	51.49	0.11	46.85	-99.00	-99.00	0.02	0.01
14JC027A01	Slaty ruth with coarser grained IF layer	69.15	0.12	25.89	-99.00	-99.00	0.14	0.02
14JC028A01	Moderately enriched AIF, well bedded with cherty and hematite rich layers	61.90	0.13	35.07	-99.00	-99.00	-0.01	0.02
14JC029A01	Enriched layered hard hematite ore	3.15	0.10	92.08	-99.00	-99.00	-0.01	-0.01
14JC030A01	Hard blue hematite ore with layering and minor vugs and breccia	1.36	0.22	95.69	-99.00	-99.00	0.05	0.03

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Appendix A: Major- and trace-element data for outcrop samples

Sample_Num	Na2O	K2O	TiO2	MnO	P2O5	Cr	Zr	Ba	LOI	Total	Fe	As	Be	Cu	Li	Mn	Ni	Pb	Rb
Method	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	Grav		Calculated	OES	OES	OES	OES	OES	OES	OES	OES
Detection Limit	0.01	0.01	0.001	0.001	0.001	1	1	1	0.01		na	2	0.1	1	0.1	1	1	1	1
Unit	%	%	%	%	%	ppm	ppm	ppm	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
JC12-065	0.02	0.97	0.004	33.279	0.089	5	-1	89	5.44	95.49	38.17	-99	0.9	4	11.2	65001	45	31	13
JC12-072	2.33	0.75	1.329	0.214	0.120	1108	90	323	3.59	100.96	10.06	-99	0.5	4	-0.1	322	31	-1	2
JC12-074	0.04	0.06	0.014	0.098	0.011	266	31	6	0.34	98.40	68.01	-99	0.7	27	12.7	1444	245	-1	37
JC12-077	1.75	8.14	0.829	0.067	0.211	6	209	1292	1.71	98.01	5.38	-99	2.9	2	12.5	512	16	-1	120
JC12-079	0.03	0.06	0.010	0.862	0.012	2	20	13	0.57	98.37	46.65	-99	1.4	4	1.5	5577	34	-1	3
JC12-080	2.98	0.47	1.791	0.228	0.244	17	106	444	3.64	98.29	9.44	-99	0.9	46	34.8	1540	60	-1	18
JC12-081	1.88	8.22	0.770	0.076	0.158	-1	496	1366	1.63	98.27	5.62	-99	2.6	3	23.1	485	7	2	132
13JC059A01	0.02	0.14	-0.001	0.162	0.012	-1	11	4	3.59	98.61	16.89	-99	0.4	3	0.1	1145	20	-1	4
13JC081A01	0.08	0.09	0.006	0.087	0.607	5	23	8	5.32	100.75	63.50	-99	0.9	5	0.3	475	50	-1	3
13JC082A01	0.09	1.29	0.008	24.364	0.060	15	20	112	4.58	99.65	47.42	-99	1.2	5	7.7	65001	42	21	18
13JC083A01	0.01	0.02	0.005	0.037	0.030	3	5	11	0.57	98.16	12.43	-99	0.7	4	2.2	300	16	3	-1
13JC083B01	0.01	0.03	1.036	0.088	0.124	260	68	97	9.64	99.59	16.79	-99	0.5	30	80.8	610	121	-1	4
13JC084A01	0.25	2.96	1.208	5.209	0.150	33	349	626	9.33	98.30	17.32	-99	4.6	8	52.8	32267	36	2	125
13JC085A01	0.07	0.11	0.049	1.853	0.117	9	26	7	9.26	100.76	29.81	-99	1.1	9	0.3	12404	32	5	2
13JC086A01	0.06	0.09	0.015	0.572	0.157	3	24	24	10.16	100.17	55.74	-99	2.0	7	0.6	3377	47	5	2
13JC086A02	0.02	0.05	0.016	0.015	0.032	3	13	12	0.89	98.25	3.45	-99	0.7	3	8.3	126	7	-1	-1
13JC087A01	2.12	1.06	0.823	0.194	0.140	338	58	576	3.53	99.14	7.89	-99	0.3	42	30.5	1222	131	-1	20
13JC054A01	0.04	1.11	0.007	34.969	0.036	4	17	5452	5.88	95.59	36.81	-99	0.7	4	6.4	65001	40	25	10
13JC055A01	0.01	0.02	0.004	0.510	0.101	2	24	46	0.86	98.20	66.87	-99	1.8	6	0.1	3095	47	6	4
14JC001A01	0.05	0.18	0.018	2.349	0.011	2	6	56	0.70	100.60	12.90	12	0.6	7	1.7	18319	17	-1	6
14JC002A01	0.05	0.08	0.017	0.063	0.004	3	18	45	0.32	100.57	46.37	12	1.0	5	-0.1	196	23	-1	4
14JC003A01	-0.01	-0.01	0.007	0.028	0.004	2	8	16	0.23	98.21	15.78	4	0.5	4	0.2	126	15	-1	3
14JC007A01	2.91	1.01	1.169	0.192	0.181	34	69	533	2.68	100.84	9.39	-2	0.4	62	20.2	1378	70	-1	20
14JC008A01	1.87	1.54	1.063	0.284	0.106	32	174	342	5.22	100.70	15.95	14	1.9	28	7.7	2120	31	-1	95
14JC009A01	2.00	3.70	0.823	0.077	0.063	36	303	1139	3.66	99.60	11.28	11	2.1	6	9.7	586	20	-1	58
14JC010A01	0.07	0.13	0.003	0.067	0.022	3	10	3	0.36	100.87	31.46	2	0.5	6	-0.1	338	30	-1	5
14JC010A02	0.01	-0.01	0.003	0.046	0.032	3	13	4	0.35	100.86	39.29	2	0.6	6	-0.1	256	33	-1	5
14JC010A03	-0.01	-0.01	0.003	0.048	0.031	5	14	5	0.28	100.74	41.73	2	0.5	7	-0.1	250	32	-1	4
14JC011A01	0.06	0.09	0.002	0.053	0.023	-1	5	2	3.80	99.93	19.30	4	0.4	7	0.5	415	24	-1	2
14JC013A01	-0.01	0.19	0.012	0.291	0.030	-1	11	5	0.62	100.78	33.89	37	1.5	5	-0.1	2014	32	-1	9
14JC014A01	-0.01	0.03	0.002	0.044	0.016	-1	7	6	1.06	100.25	33.57	24	1.7	6	-0.1	239	25	-1	3
14JC020A01	-0.01	0.08	0.011	0.037	0.069	4	10	28	1.31	100.72	33.69	12	2.9	6	2.9	247	32	8	7
14JC021A01	0.08	0.11	0.003	0.042	0.027	3	14	4	0.24	100.51	46.41	-2	0.3	4	0.2	157	25	-1	3
14JC021A02	0.07	0.11	0.003	0.014	0.011	2	5	3	1.11	100.45	8.77	-2	0.2	5	3.7	92	11	-1	-1
14JC022A01	0.07	0.11	0.002	0.019	0.110	-1	6	7	2.82	100.23	14.66	-2	0.8	4	-0.1	161	21	-1	3
14JC022A02	0.01	0.02	0.011	0.043	0.061	10	15	23	0.64	100.24	30.37	5	0.7	4	0.5	260	21	-1	4
14JC023A01	0.07	0.11	0.026	0.214	0.107	2	25	20	0.68	100.58	68.87	12	1.1	7	-0.1	1284	47	-1	2
14JC024A01	0.08	0.66	0.014	10.115	0.146	-1	21	401	3.79	99.82	56.64	11	0.9	9	3.2	45992	44	2	12
14JC024A02	0.06	0.09	0.025	0.245	0.646	5	35	61	4.01	100.80	63.86	22	1.5	44	-0.1	1463	74	2	7
14JC025A01	0.05	0.09	0.006	0.103	0.335	2	17	7	5.92	100.76	45.79	3	1.1	7	-0.1	642	39	-1	4
14JC026A01	-0.01	-0.01	0.008	0.050	0.038	3	7	421	1.30	99.89	32.77	3	0.9	6	-0.1	332	31	-1	4
14JC027A01	0.02	0.03	0.006	1.130	0.019	-1	7	8	4.47	101.00	18.10	10	2.2	5	2.5	8582	27	-1	3
14JC028A01	0.02	0.03	0.006	0.037	0.244	2	11	13	1.37	98.83	24.52	12	1.2	5	19.9	265	27	-1	3
14JC029A01	0.02	0.03	0.015	0.077	0.221	4	22	11	5.12	100.83	64.39	37	1.2	6	-0.1	403	46	-1	6
14JC030A01	0.03	0.04	0.011	0.175	0.228	5	23	21	1.30	99.14	66.92	33	1.9	8	1.8	964	48	-1	7

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Appendix A: Major- and trace-element data for outcrop samples

Sample_Num	Sc	Ti	Zn	V	Co	Ga	Ge	As	Sr	Y	Nb	Mo	Cd	In	Sn	Cs	La
Method	OES	OES	OES	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS
Detection Limit	0.1	1	1	5	1	1	1	5	1	1	1	2	0.2	0.2	1	0.5	0.5
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
JC12-065	0.9	12	110	46	301	7	13	19	40	18	7	-2	-99	-0.2	-1	-0.5	57.9
JC12-072	-0.1	26	22	273	53	14	2	-5	188	16	14	-2	-99	-0.2	1	-0.5	11.3
JC12-074	41.0	7405	88	33	3	-1	19	7	2	2	9	-2	-99	-0.2	-1	-0.5	2.2
JC12-077	10.7	5077	86	23	7	31	9	7	38	61	37	-2	-99	-0.2	3	-0.5	172.8
JC12-079	-0.1	32	29	11	62	1	12	23	5	8	3	-2	-99	-0.2	-1	-0.5	5.0
JC12-080	29.9	11150	103	276	51	21	4	-5	350	19	20	-2	-99	-0.2	1	-0.5	18.9
JC12-081	15.3	5265	135	-5	4	34	7	6	52	42	54	-2	-99	-0.2	2	-0.5	71.3
13JC059A01	-0.1	6	20	5	28	-1	8	12	2	-1	5	-2	0.5	-0.2	-1	-0.5	0.5
13JC081A01	-0.1	-1	65	28	7	1	16	20	4	16	5	3	0.6	-0.2	-1	-0.5	5.7
13JC082A01	-0.1	-1	49	43	55	3	13	27	28	29	-1	3	-0.2	-0.2	-1	-0.5	6.8
13JC083A01	0.3	30	14	32	45	1	6	8	4	6	4	-2	0.2	-0.2	-1	-0.5	5.8
13JC083B01	22.1	5066	88	215	33	14	9	-5	6	33	11	-2	0.2	-0.2	-1	0.6	12.0
13JC084A01	11.4	7933	65	217	66	22	14	13	35	46	93	5	0.7	-0.2	3	2.7	57.1
13JC085A01	0.6	284	22	72	20	2	12	9	2	11	4	2	-0.2	-0.2	-1	0.6	6.6
13JC086A01	-0.1	49	42	37	13	1	12	11	6	20	2	-2	0.5	-0.2	2	-0.5	8.9
13JC086A02	0.3	148	7	14	50	-1	4	-5	1	3	5	-2	-0.2	-0.2	-1	-0.5	5.4
13JC087A01	34.9	5193	81	243	53	17	3	-5	513	16	8	-2	-0.2	-0.2	-1	-0.5	10.8
13JC054A01	0.2	25	100	24	193	4	10	10	19	8	3	3	0.9	-0.2	1	-0.5	7.5
13JC055A01	-0.1	13	39	99	10	2	17	25	8	5	2	4	0.7	-0.2	1	-0.5	5.8
14JC001A01	0.6	89	12	10	-99	-1	5	-99	15	3	4	-2	-0.2	-99	-1	-0.5	3.0
14JC002A01	-0.1	53	15	24	-99	-1	11	-99	5	2	1	-2	-0.2	-99	-1	-0.5	2.9
14JC003A01	0.1	25	8	15	-99	-1	6	-99	3	-1	4	-2	-0.2	-99	1	-0.5	2.3
14JC007A01	38.6	7623	102	240	-99	20	4	-99	498	21	4	-2	-0.2	-99	-1	-0.5	14.8
14JC008A01	15.0	7073	77	121	-99	18	6	-99	24	17	31	-2	0.3	-99	2	6.0	30.4
14JC009A01	9.0	4543	66	65	-99	24	5	-99	150	18	43	-2	-0.2	-99	2	1.7	46.9
14JC010A01	-0.1	13	17	8	-99	-1	11	-99	3	3	2	-2	-0.2	-99	1	-0.5	1.5
14JC010A02	-0.1	12	20	19	-99	-1	13	-99	4	3	-1	-2	-0.2	-99	-1	-0.5	3.2
14JC010A03	-0.1	8	21	19	-99	1	13	-99	3	2	2	-2	-0.2	-99	-1	-0.5	2.8
14JC011A01	-0.1	6	17	10	-99	-1	4	-99	2	2	-1	-2	-0.2	-99	-1	-0.5	3.1
14JC013A01	-0.1	68	26	35	-99	2	17	-99	3	4	4	-2	0.3	-99	-1	0.7	5.8
14JC014A01	-0.1	7	17	37	-99	2	11	-99	2	13	4	-2	-0.2	-99	-1	-0.5	6.6
14JC020A01	2.0	53	24	36	-99	2	18	-99	5	2	2	2	0.3	-99	-1	0.7	4.9
14JC021A01	-0.1	8	15	21	-99	2	5	-99	2	-1	2	4	0.3	-99	-1	-0.5	3.6
14JC021A02	0.1	11	7	17	-99	-1	5	-99	-1	2	2	-2	-0.2	-99	-1	-0.5	2.6
14JC022A01	-0.1	13	15	22	-99	2	5	-99	3	2	2	-2	-0.2	-99	-1	-0.5	6.8
14JC022A02	0.2	52	14	53	-99	3	12	-99	58	6	4	3	0.3	-99	-1	-0.5	48.8
14JC023A01	-0.1	116	39	94	-99	2	14	-99	8	14	2	2	0.3	-99	-1	-0.5	8.1
14JC024A01	-0.1	62	45	71	-99	2	12	-99	26	3	3	-2	-0.2	-99	-1	-0.5	11.8
14JC024A02	-0.1	-1	75	75	-99	7	15	-99	84	14	16	8	-0.2	-99	10	-0.5	97.8
14JC025A01	-0.1	16	34	38	-99	1	13	-99	3	20	1	-2	-0.2	-99	-1	-0.5	10.3
14JC026A01	-0.1	36	21	12	-99	2	11	-99	3	2	4	-2	-0.2	-99	1	-0.5	1.9
14JC027A01	-0.1	30	20	26	-99	1	38	-99	2	8	2	-2	1.0	-99	-1	-0.5	5.3
14JC028A01	-0.1	26	24	25	-99	4	7	-99	8	6	2	4	-0.2	-99	-1	-0.5	38.5
14JC029A01	-0.1	54	52	27	-99	1	8	-99	6	12	2	6	-0.2	-99	-1	-0.5	6.9
14JC030A01	-0.1	50	42	40	-99	2	9	-99	16	14	2	4	-0.2	-99	-1	-0.5	7.5

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Appendix A: Major- and trace-element data for outcrop samples

Sample_Num	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf	Ta	W	Tl
Method	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS
Detection Limit	0.5	0.1	0.2	0.1	0.05	0.1	0.1	0.1	0.1	0.1	0.05	0.1	0.05	0.2	0.5	1	0.1
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
JC12-065	98.8	15.0	73.8	16.2	3.79	11.8	1.2	5.2	0.8	1.9	0.23	1.2	0.18	1.1	-0.5	1	-0.1
JC12-072	23.8	3.2	13.9	3.8	1.10	3.6	0.6	3.4	0.7	1.9	0.28	1.7	0.26	4.3	0.9	-1	-0.1
JC12-074	2.5	0.2	1.0	0.2	0.08	0.2	-0.1	0.3	-0.1	0.2	-0.05	0.3	0.05	1.3	-0.5	2	-0.1
JC12-077	333.6	37.6	141.3	19.9	5.04	16.7	2.1	12.0	2.2	6.2	0.83	5.2	0.75	5.4	2.4	1	-0.1
JC12-079	11.7	0.9	3.7	0.8	0.15	1.0	0.1	0.9	0.1	0.5	-0.05	0.3	-0.05	-0.2	-0.5	2	-0.1
JC12-080	41.9	5.4	23.5	4.8	1.54	4.7	0.7	3.7	0.7	2.0	0.22	1.8	0.19	2.8	1.3	-1	-0.1
JC12-081	148.7	17.9	69.9	13.5	3.13	11.4	1.6	8.9	1.6	5.4	0.71	5.0	0.69	11.7	3.3	-1	-0.1
13JC059A01	1.1	0.1	0.6	0.1	-0.05	0.2	-0.1	0.1	-0.1	0.1	-0.05	-0.1	-0.05	0.4	2.1	-99	-0.1
13JC081A01	12.8	1.6	5.6	1.0	0.42	1.4	0.3	1.8	0.5	1.4	0.27	1.0	0.24	0.4	-0.5	-99	0.1
13JC082A01	20.0	2.0	8.1	1.9	0.61	2.7	0.4	3.3	0.8	2.5	0.33	1.9	0.26	-0.2	-0.5	-99	-0.1
13JC083A01	6.7	1.2	4.5	1.0	0.30	1.0	0.2	0.9	0.2	0.6	0.11	0.3	0.09	0.6	3.5	-99	-0.1
13JC083B01	20.1	3.6	16.9	3.7	1.10	4.6	0.6	3.7	0.8	2.0	0.26	1.5	0.26	2.1	0.8	-99	-0.1
13JC084A01	113.8	13.6	52.5	9.6	2.20	8.8	1.3	8.0	1.6	4.7	0.71	4.6	0.67	9.7	7.5	-99	-0.1
13JC085A01	13.5	1.7	7.2	1.6	0.53	1.7	0.3	1.6	0.4	1.3	0.14	0.9	0.11	0.3	-0.5	-99	-0.1
13JC086A01	17.1	2.0	8.8	1.6	0.50	2.0	0.3	2.1	0.5	1.6	0.21	1.3	0.18	-0.2	-0.5	-99	-0.1
13JC086A02	8.1	0.9	4.0	0.6	0.13	0.5	-0.1	0.3	-0.1	0.2	-0.05	0.2	-0.05	0.5	8.2	-99	-0.1
13JC087A01	24.8	3.3	15.3	3.5	1.05	3.3	0.5	3.1	0.7	1.9	0.25	1.7	0.26	2.1	-0.5	-99	-0.1
13JC054A01	19.6	1.7	7.3	1.5	0.69	1.7	0.2	1.4	0.3	0.7	0.10	0.5	0.06	-0.2	-0.5	-99	-0.1
13JC055A01	10.3	0.8	3.4	0.8	0.25	1.0	0.2	1.0	0.2	0.6	0.08	0.5	0.06	-0.2	-0.5	-99	-0.1
14JC001A01	6.9	0.6	2.6	0.6	0.22	0.6	-0.1	0.6	0.1	0.3	-0.05	0.4	0.06	-0.2	10.8	-99	-0.1
14JC002A01	3.9	0.4	1.6	0.3	0.12	0.3	-0.1	0.3	-0.1	0.2	-0.05	0.2	-0.05	-0.2	3.2	-99	-0.1
14JC003A01	2.1	0.2	0.9	0.2	-0.05	0.1	-0.1	0.2	-0.1	-0.1	-0.05	-0.1	-0.05	-0.2	12.4	-99	-0.1
14JC007A01	30.4	4.1	19.0	3.9	1.41	4.1	0.7	4.1	0.8	2.5	0.36	2.4	0.36	2.0	0.6	-99	-0.1
14JC008A01	61.3	6.8	25.4	4.9	1.29	4.0	0.6	3.7	0.6	2.1	0.27	1.9	0.30	5.1	2.0	-99	-0.1
14JC009A01	88.6	9.9	35.2	6.0	1.77	4.4	0.7	3.7	0.7	2.3	0.30	2.3	0.37	7.8	2.4	-99	-0.1
14JC010A01	2.3	0.2	1.5	0.3	0.12	0.4	-0.1	0.5	-0.1	0.2	-0.05	0.1	-0.05	-0.2	6.1	-99	-0.1
14JC010A02	2.5	0.3	1.5	0.4	0.12	0.4	-0.1	0.4	-0.1	0.2	-0.05	0.2	-0.05	-0.2	3.3	-99	-0.1
14JC010A03	2.1	0.3	1.0	0.1	0.07	0.3	-0.1	0.4	-0.1	0.2	-0.05	0.2	-0.05	-0.2	5.0	-99	-0.1
14JC011A01	2.2	0.3	1.0	0.2	-0.05	0.2	-0.1	0.2	-0.1	0.1	-0.05	-0.1	-0.05	-0.2	2.8	-99	-0.1
14JC013A01	7.8	0.8	3.6	0.5	0.17	0.6	-0.1	0.6	-0.1	0.3	-0.05	0.2	-0.05	-0.2	1.2	-99	-0.1
14JC014A01	13.1	1.1	5.1	1.1	0.36	1.6	0.2	2.0	0.5	1.3	0.17	1.0	0.13	-0.2	3.2	-99	-0.1
14JC020A01	6.4	0.8	3.1	0.6	0.18	0.5	-0.1	0.5	-0.1	0.2	-0.05	0.2	-0.05	-0.2	2.3	-99	-0.1
14JC021A01	3.5	0.3	1.2	0.2	-0.05	0.1	-0.1	0.2	-0.1	-0.1	-0.05	-0.1	-0.05	-0.2	4.9	-99	-0.1
14JC021A02	1.7	0.1	0.8	0.1	-0.05	0.2	-0.1	0.2	-0.1	0.2	-0.05	0.1	-0.05	-0.2	5.1	-99	-0.1
14JC022A01	10.3	1.1	5.1	0.8	0.19	0.6	-0.1	0.3	-0.1	0.3	-0.05	0.2	-0.05	-0.2	2.9	-99	-0.1
14JC022A02	51.2	3.5	12.3	1.4	0.43	1.3	0.2	1.0	0.2	0.5	0.07	0.4	-0.05	-0.2	4.6	-99	-0.1
14JC023A01	11.9	1.2	4.8	1.0	0.36	1.4	0.2	1.9	0.3	1.0	0.14	0.8	0.07	-0.2	-0.5	-99	-0.1
14JC024A01	18.0	1.9	7.7	1.8	0.46	1.7	0.2	1.0	0.1	0.4	-0.05	0.3	-0.05	0.2	0.6	-99	-0.1
14JC024A02	125.1	17.8	77.8	15.6	3.91	12.3	1.3	5.4	0.8	1.5	0.12	0.7	-0.05	-0.2	0.5	-99	-0.1
14JC025A01	17.0	1.9	8.5	1.5	0.54	2.2	0.3	2.3	0.5	1.8	0.23	1.2	0.11	-0.2	1.4	-99	-0.1
14JC026A01	2.9	0.2	1.0	0.3	0.05	0.3	-0.1	0.3	-0.1	0.2	-0.05	0.3	-0.05	-0.2	2.4	-99	-0.1
14JC027A01	9.6	1.0	4.0	0.9	0.35	1.1	0.2	1.2	0.3	0.9	0.12	0.6	-0.05	-0.2	2.7	-99	-0.1
14JC028A01	34.5	8.3	28.5	3.3	0.73	2.0	0.2	1.2	0.2	0.6	-0.05	0.5	-0.05	-0.2	3.1	-99	-0.1
14JC029A01	12.0	1.5	6.3	1.2	0.36	1.4	0.2	1.4	0.3	0.9	0.12	0.8	0.07	-0.2	-0.5	-99	-0.1
14JC030A01	16.4	1.5	6.5	1.5	0.37	1.6	0.2	1.8	0.4	1.2	0.15	1.0	0.11	0.2	-0.5	-99	-0.1

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Appendix A: Major- and trace-element data for outcrop samples

Sample_Num	Bi	Th	U	Remarks
Method	MS-FUS	MS-FUS	MS-FUS	
Detection Limit	0.4	0.1	0.1	
Unit	ppm	ppm	ppm	
JC12-065	-0.4	0.1	1.2	REFUSED AND REANALYZED
JC12-072	-0.4	1.1	0.2	
JC12-074	-0.4	0.3	0.6	
JC12-077	-0.4	6.7	0.6	
JC12-079	-0.4	0.2	-0.1	
JC12-080	-0.4	1.4	0.3	
JC12-081	-0.4	8.1	1.1	
13JC059A01	1.7	-0.1	-0.1	
13JC081A01	1.1	0.2	0.5	
13JC082A01	-0.4	0.4	4.2	
13JC083A01	0.8	0.2	0.2	
13JC083B01	1.4	0.9	0.2	
13JC084A01	1.8	9.8	4.9	
13JC085A01	-0.4	0.3	0.7	
13JC086A01	1.4	0.1	0.5	
13JC086A02	-0.4	0.2	-0.1	
13JC087A01	0.5	0.5	0.1	
13JC054A01	2.8	-0.1	1.0	
13JC055A01	2.1	0.1	0.9	
14JC001A01	-0.4	-0.1	-0.1	
14JC002A01	0.4	-0.1	-0.1	
14JC003A01	0.9	-0.1	-0.1	
14JC007A01	-0.4	0.7	0.1	
14JC008A01	0.7	4.5	0.6	REFUSED AND REANALYZED
14JC009A01	-0.4	6.5	0.8	
14JC010A01	-0.4	-0.1	0.2	
14JC010A02	-0.4	-0.1	0.2	
14JC010A03	0.7	-0.1	0.2	
14JC011A01	0.8	-0.1	-0.1	
14JC013A01	1.4	0.1	-0.1	
14JC014A01	-0.4	-0.1	-0.1	
14JC020A01	1.8	0.4	1.2	
14JC021A01	0.6	-0.1	-0.1	
14JC021A02	-0.4	-0.1	0.1	
14JC022A01	-0.4	-0.1	0.5	
14JC022A02	1.1	0.4	0.3	
14JC023A01	0.8	0.2	0.5	
14JC024A01	0.7	0.1	0.5	
14JC024A02	0.4	-0.1	0.7	
14JC025A01	-0.4	0.1	0.6	
14JC026A01	-0.4	0.1	0.1	
14JC027A01	-0.4	-0.1	0.5	
14JC028A01	-0.4	0.1	0.5	
14JC029A01	-0.4	-0.1	0.3	
14JC030A01	-0.4	0.1	2.2	

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Appendix B: Diamond-drill hole collar information

DDH_ID	Deposit	Company	Length_m	UTMEast	UTMNorth	UTMZone	Datum	Elevation_m	Dip	Azimuth
DDH-SL-04A-2008	Sawyer Lake	Labrador Iron Mines	52	695350	6037801	19	NAD27	603	-90	0
DDH-SL-07-2008	Sawyer Lake	Labrador Iron Mines	83	695382	6037734	19	NAD27	607	-90	0
DDH-SL-09-2008	Sawyer Lake	Labrador Iron Mines	51	695541	6037740	19	NAD27	582	-90	0
JOY-13-151	Joyce Lake	Century Iron Mines Corporation	99	658829	6086252	19	NAD27	512	-70	46
JOY-13-153	Joyce Lake	Century Iron Mines Corporation	199.5	658237	6086228	19	NAD27	517	-67	46
JOY-13-156	Joyce Lake	Century Iron Mines Corporation	198	658387	6086385	19	NAD27	512	-90	0
MM-13-15	CLC South	Mamba Minerals Limited	100	307833	6040568	19	NAD27	547	-45	90
MM-13-05	CLC	Mamba Minerals Limited	318.2	308932	6040523	19	NAD27	578	-50	330
MM-13-06	CLC	Mamba Minerals Limited	141.4	308815	6040516	19	NAD27	584	-50	150
MM-13-08	CLC	Mamba Minerals Limited	263	308777	6040772	19	NAD27	594	-55	150
JOY-12-96	Joyce Lake	Century Iron Mines Corporation	103.5	658995	6086153	19	NAD27	528	-90	0

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Appendix C: Major- and trace-element data for drillcore samples

Sample_Num Method Detection Limit Unit	Lab_Num	Showing	DDH_ID	From_m	To_m	Litho_code	Mag_suscep	Description
13JC_C99	10440909	Sawyer Lake	DDH-SL-04A-2008	31.80	32.10	HG	31.95	High grade blue ore
13JC_C100	10440911	Sawyer Lake	DDH-SL-04A-2008	42.70	42.90	AIF	42.80	Cherty band in high grade ore, with hematite fragments
13JC_C101	10440912	Sawyer Lake	DDH-SL-09-2008	13.35	13.65	AIF	13.50	Moderately enriched cherty iron formation
13JC_C102	10440913	Sawyer Lake	DDH-SL-09-2008	41.00	41.20	AIF	41.10	Limonite altered cherty iron formation
13JC_C104	10440914	Sawyer Lake	DDH-SL-07-2008	9.00	9.30	AIF	9.15	High grade blue ore
13JC_C106	10440915	Sawyer Lake	DDH-SL-07-2008	37.40	37.70	AIF	37.55	Banded low grade iron formation
13JC_C107	10440916	Sawyer Lake	DDH-SL-07-2008	50.30	50.50	AIF	50.40	Low grade iron formation, banded with hematite patches
13JC_C108	10440917	CLC	MM-13-05	42.40	42.80	AIF	42.60	Banded red blue hematite and white chert
13JC_C109	10440918	CLC	MM-13-05	84.50	84.80	HG	84.65	High grade blue ore
13JC_C111	10440919	CLC	MM-13-05	175.10	175.40	AIF	175.3	Brecciated hematite with banded limonite
13JC_C115	10440921	CLC	MM-13-05	287.70	287.90	HG	287.8	High grade blue ore
13JC_C116	10440922	CLC	MM-13-06	18.40	18.60	AIF	18.50	Banded white chert and red hematite, with Fe enrichment
13JC_C117	10440923	CLC	MM-13-06	99.70	99.90	Nimish	99.80	Tuff at base of Sokoman
13JC_C118	10440924	CLC	MM-13-06	127.90	128.20	Ruth	128.1	Ruth shale with minor chert bands
13JC_C120	10440925	CLC	MM-13-08	182.30	182.60	AIF	182.5	Limonite altered iron formation with coarse grained specularite
13JC_C121	10440926	CLC	MM-13-08	189.60	190.00	AIF	189.8	Vuggy quartz and banded hematite
14JC-C061	10441026	Joyce Lake	JOY-13-156	119.65	119.80	AIF	2.80	Medium grained oxidized iron formation, hematite with disseminated chert
14JC-C062	10441027	Joyce Lake	JOY-13-156	140.70	140.90	AIF	0.50	Banded cherty oxidized iron formation
14JC-C063	10441028	Joyce Lake	JOY-13-156	157.40	157.40	HG	0.75	High grade vuggy hematite ore
14JC-C064	10441029	Joyce Lake	JOY-13-156	171.05	171.05	HG	0.60	High grade hematite ore, banded, below cherty layer
14JC-C065	10441031	Joyce Lake	JOY-13-156	188.25	188.25	AIF	0.20	Banded oxidized iron formation below ore zone
14JC-C066	10441032	Joyce Lake	JOY-13-156	196.95	196.95	Ruth	0.14	Possible Ruth Shale
14JC-C068	10441033	Joyce Lake	JOY-13-153	191.50	191.65	HG	1.16	Friable high grade ore
14JC-C072	10441034	CLC South	MM-13-15	28.23	28.44	AIF	13.60	Oxidized iron formation with hematite bands and cherty layers with disseminated hematite
14JC-C067	10441093	Joyce Lake	JOY-13-156	36.60	36.75	AIF	2.90	Enriched AIF, with bands of hematite and disseminated hematite
14JC-C069	10441094	Joyce Lake	JOY-13-151	5.00	5.15	AIF	0.40	Vuggy and banded oxidized iron formation
14JC-C070	10441095	Joyce Lake	JOY-13-151	12.55	12.70	HG	0.75	High grade hematite ore with well defined banding
14JC-C071	10441096	Joyce Lake	JOY-13-151	19.80	19.95	HG	0.75	Weakly brecciated high grade hematite ore
14JC-C073	10441097	CLC South	MM-13-15	34.50	34.78	AIF	12.45	Partly enriched oxidized iron formation, with hematite and disseminated chert/quartz

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Appendix C: Major- and trace-element data for drillcore samples

Sample_Num	SiO2	Al2O3	Fe2O3 Total	Fe2O3	FeO	MgO	CaO	Na2O	K2O	TiO2	MnO	P2O5	Cr	Zr	Ba	LOI	Total
Method	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	
Detection Limit	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.001	0.001	0.001	1	1	1	0.01	
Unit	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm	%	%
13JC_C99	0.93	0.05	98.08	-99	-99	0.01	0.02	0.09	0.16	0.010	0.067	0.011	2	28	5	0.34	99.79
13JC_C100	43.35	0.09	55.83	-99	-99	0.03	0.03	0.08	0.10	0.013	0.079	0.012	11	19	37	0.47	100.08
13JC_C101	52.65	0.11	45.33	-99	-99	0.03	0.03	0.08	0.11	0.003	0.054	0.011	1	14	16	0.35	98.74
13JC_C102	66.96	0.25	28.60	-99	-99	0.01	0.02	0.01	0.03	0.004	0.032	0.054	4	7	8	3.65	99.62
13JC_C104	42.83	0.06	57.43	-99	-99	0.02	0.03	0.09	0.11	0.006	0.045	0.008	5	18	51	0.28	100.92
13JC_C106	55.38	0.08	43.68	-99	-99	0.01	0.02	0.09	0.12	0.010	0.051	0.011	3	15	21	0.38	99.84
13JC_C107	55.24	0.05	44.97	-99	-99	0.02	0.02	0.03	0.04	0.004	0.039	0.031	2	12	7	0.46	100.89
13JC_C108	43.22	0.21	53.74	-99	-99	-0.01	0.02	0.03	0.04	0.016	0.079	0.053	3	24	18	2.89	100.31
13JC_C109	6.23	0.15	92.96	-99	-99	-0.01	0.03	0.03	0.03	0.014	0.302	0.076	3	29	19	0.77	100.60
13JC_C111	61.29	0.23	34.43	-99	-99	0.01	0.02	0.05	0.09	0.044	0.181	0.077	2	30	9	3.70	100.12
13JC_C115	7.35	2.31	86.04	-99	-99	0.05	0.05	0.06	0.08	0.117	0.184	0.159	5	81	88	2.27	98.66
13JC_C116	51.64	0.14	45.94	-99	-99	0.02	0.01	0.05	0.07	0.002	0.042	0.034	3	14	24	0.68	98.62
13JC_C117	36.66	18.33	23.13	-99	-99	9.85	0.02	0.03	0.05	1.965	0.411	0.045	76	125	55	8.83	99.33
13JC_C118	44.60	5.14	25.25	-99	-99	1.61	0.65	0.05	0.58	0.566	6.018	0.136	19	234	113	14.59	99.19
13JC_C120	53.17	0.20	44.40	-99	-99	0.03	0.02	0.04	0.08	0.029	0.052	0.019	2	20	9	1.47	99.51
13JC_C121	51.34	0.13	47.22	-99	-99	0.02	0.03	0.06	0.10	0.003	0.043	0.046	2	7	107	0.71	99.70
14JC-C061	59.14	0.04	40.91	-99	-99	0.01	0.01	0.05	0.05	0.002	0.023	0.023	6	8	5	0.46	100.73
14JC-C062	40.07	0.28	59.17	-99	-99	-0.01	0.02	0.04	0.06	0.009	0.084	0.072	12	20	11	0.88	100.68
14JC-C063	0.46	0.10	97.55	-99	-99	-0.01	0.02	0.03	0.04	0.005	0.115	0.114	1	23	8	0.60	99.03
14JC-C064	3.80	0.43	91.40	-99	-99	0.02	0.02	0.07	0.09	0.011	0.835	0.125	-1	21	35	1.31	98.11
14JC-C065	64.79	0.51	33.85	-99	-99	-0.01	0.02	0.04	0.06	0.049	0.312	0.056	6	22	60	0.86	100.55
14JC-C066	34.23	1.19	62.32	-99	-99	0.02	0.05	-0.01	-0.01	0.145	0.061	0.217	14	50	117	2.73	100.89
14JC-C068	0.48	0.18	98.93	-99	-99	0.01	0.03	0.04	0.03	0.014	0.149	0.058	6	21	50	0.57	100.49
14JC-C072	37.92	0.14	60.57	-99	-99	-0.01	0.02	-0.01	0.02	0.007	0.053	0.020	13	7	20	0.53	99.28
14JC-C067	54.86	0.06	44.17	-99	-99	0.02	0.02	-0.01	0.01	0.008	0.042	0.011	4	13	21	0.41	99.62
14JC-C069	53.79	0.15	44.00	-99	-99	-0.01	0.01	-0.01	-0.01	0.004	0.057	0.035	3	7	8	0.70	98.75
14JC-C070	0.46	0.07	96.61	-99	-99	-0.01	0.02	0.03	0.02	0.002	0.161	0.063	1	9	7	0.56	98.01
14JC-C071	1.20	0.34	97.07	-99	-99	-0.01	0.02	0.03	0.06	0.005	0.367	0.101	1	24	25	1.48	100.69
14JC-C073	42.04	0.06	56.60	-99	-99	0.02	0.04	0.03	0.07	0.006	0.419	0.030	1	13	22	0.43	99.74

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Appendix C: Major- and trace-element data for drillcore samples

Sample_Num	Fe	As	Be	Cu	Li	Mn	Ni	Pb	Rb	Sc	Ti	Zn	V	Co	Ga	Ge	As	Sr	Y	Nb
Method	Calculated	OES	OES	OES	OES	OES	OES	OES	OES	OES	OES	OES	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS
Detection Limit	na	2	0.1	1	0.1	1	1	1	1	0.1	1	1	5	1	1	1	5	1	1	1
Unit	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
13JC_C99	68.59	-99	0.3	4	0.5	285	36	2	-1	-0.1	27	23	72	15	-1	16	5	2	-1	4
13JC_C100	39.04	-99	0.4	5	2.0	435	26	1	-1	0.1	42	14	185	186	-1	9	6	5	3	3
13JC_C101	31.70	-99	0.5	5	1.5	291	22	-1	-1	-0.1	14	12	20	37	-1	11	6	8	2	2
13JC_C102	20.00	-99	1.1	7	1.8	252	25	2	-1	-0.1	28	18	29	36	1	10	-5	4	3	3
13JC_C104	40.16	-99	0.6	7	1.5	260	31	1	-1	-0.1	24	18	47	53	-1	13	7	6	2	3
13JC_C106	30.54	-99	0.7	5	1.5	382	31	1	1	0.4	61	18	61	42	-1	7	-5	2	3	3
13JC_C107	31.44	-99	0.7	6	1.0	251	28	-1	-1	0.1	20	14	31	239	-1	13	7	9	2	3
13JC_C108	37.58	-99	0.5	6	1.5	539	35	3	1	-0.1	92	23	42	82	-1	18	5	7	9	6
13JC_C109	65.01	-99	0.3	6	0.3	1797	47	3	-1	-0.1	71	33	59	21	-1	30	11	6	4	4
13JC_C111	24.08	-99	0.5	5	1.0	1356	29	1	-1	0.2	304	20	46	108	-1	12	-5	4	8	6
13JC_C115	60.17	-99	0.7	6	3.1	1005	47	1	7	0.3	688	34	78	13	5	14	13	132	11	16
13JC_C116	32.12	-99	1.2	5	2.3	218	32	5	-1	-0.1	38	20	31	67	-1	17	73	4	4	4
13JC_C117	16.17	-99	0.9	29	122.1	2813	68	-1	6	26.4	12148	113	248	57	23	8	19	62	12	27
13JC_C118	17.66	-99	2.8	11	38.8	36047	30	2	23	5.4	3671	60	104	24	15	11	8	8	33	50
13JC_C120	31.05	-99	0.8	5	1.9	237	28	-1	-1	-0.1	226	16	22	105	-1	14	7	3	2	4
13JC_C121	33.02	-99	0.8	4	1.6	181	27	1	2	-0.1	35	15	23	118	-1	14	7	8	9	2
14JC-C061	28.61	2	0.4	4	-0.1	160	22	-1	4	0.2	12	13	12	-99	-1	10	-99	8	-1	4
14JC-C062	41.38	20	1.0	7	0.7	532	34	-1	5	-0.1	43	24	84	-99	2	17	-99	8	3	2
14JC-C063	68.22	13	0.5	6	-0.1	563	39	-1	6	-0.1	16	28	32	-99	3	14	-99	5	4	-1
14JC-C064	63.92	19	1.5	19	-0.1	5315	45	-1	10	-0.1	56	37	50	-99	3	33	-99	11	15	4
14JC-C065	23.67	9	0.9	4	0.6	2353	30	-1	5	0.7	339	19	106	-99	2	10	-99	7	15	4
14JC-C066	43.58	24	1.9	7	0.7	398	43	1	9	1.6	878	31	276	-99	6	20	-99	375	36	6
14JC-C068	69.18	5	0.5	5	-0.1	729	34	-1	4	-0.1	46	24	74	-99	3	23	-99	330	2	3
14JC-C072	42.36	4	1.0	7	4.2	285	34	-1	5	-0.1	28	21	50	-99	1	18	-99	13	3	1
14JC-C067	30.89	15	0.9	4	-0.1	233	20	-1	5	0.1	31	13	15	-99	1	7	-99	22	2	3
14JC-C069	30.77	15	1.9	5	-0.1	1007	36	-1	6	-0.1	-1	27	44	-99	3	11	-99	6	8	3
14JC-C070	67.56	10	1.4	4	3.6	415	26	-1	3	-0.1	14	17	30	-99	5	18	-99	4	3	-1
14JC-C071	67.88	35	1.6	6	1.6	2301	41	-1	7	-0.1	-1	34	48	-99	3	27	-99	8	6	4
14JC-C073	39.58	-2	0.5	6	-0.1	3230	22	-1	3	-0.1	11	14	11	-99	-1	11	-99	5	4	7

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Appendix C: Major- and trace-element data for drillcore samples

Sample_Num	Mo	Cd	In	Sn	Cs	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb
Method	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS
Detection Limit	2	0.2	0.2	1	0.5	0.5	0.5	0.1	0.2	0.1	0.05	0.1	0.1	0.1	0.1	0.1	0.05	0.1
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
13JC_C99	-2	0.5	-0.2	-1	-0.5	0.7	1.3	0.1	0.6	0.1	-0.05	0.1	-0.1	0.2	-0.1	-0.1	-0.05	-0.1
13JC_C100	4	0.6	-0.2	-1	-0.5	3.4	5.0	0.5	2.5	0.6	0.12	0.4	-0.1	0.4	-0.1	0.2	-0.05	0.2
13JC_C101	-2	0.6	-0.2	-1	-0.5	8.7	9.2	1.5	7.3	1.3	0.26	1.1	0.1	0.6	-0.1	0.2	-0.05	0.1
13JC_C102	-2	-0.2	-0.2	1	-0.5	2.4	2.8	0.2	1.0	0.5	0.09	0.4	-0.1	0.4	-0.1	0.3	-0.05	0.2
13JC_C104	2	-0.2	-0.2	-1	-0.5	1.5	2.0	0.2	1.0	0.2	0.07	0.3	-0.1	0.2	-0.1	0.1	-0.05	0.1
13JC_C106	-2	0.5	-0.2	-1	-0.5	1.6	2.5	0.3	1.2	0.3	0.07	0.4	-0.1	0.4	-0.1	0.2	-0.05	0.2
13JC_C107	-2	0.4	-0.2	-1	-0.5	7.0	7.8	0.6	2.0	0.2	0.09	0.3	-0.1	0.2	-0.1	0.2	-0.05	0.1
13JC_C108	-2	0.3	-0.2	-1	-0.5	1.7	5.0	0.5	2.3	0.7	0.23	0.9	0.1	1.1	0.2	0.7	0.11	0.8
13JC_C109	-2	-0.2	-0.2	-1	-0.5	2.0	3.9	0.4	2.0	0.5	0.15	0.6	-0.1	0.6	0.1	0.3	0.05	0.4
13JC_C111	-2	-0.2	-0.2	-1	-0.5	6.6	11.8	1.1	4.7	0.7	0.22	0.9	0.1	0.9	0.2	0.8	0.10	0.7
13JC_C115	-2	0.2	-0.2	1	-0.5	28.6	35.5	4.3	13.5	1.7	0.44	1.6	0.3	1.8	0.4	1.4	0.20	1.5
13JC_C116	-2	0.5	-0.2	1	-0.5	2.7	4.1	0.6	2.6	0.7	0.21	0.7	0.1	0.8	0.2	0.5	0.07	0.3
13JC_C117	-2	0.2	-0.2	2	-0.5	16.7	33.7	4.1	16.1	3.2	0.77	2.4	0.4	2.5	0.5	1.5	0.21	1.4
13JC_C118	4	0.3	-0.2	4	-0.5	46.8	93.0	10.8	40.4	6.6	1.17	5.7	0.9	5.5	1.2	3.8	0.56	3.8
13JC_C120	-2	0.4	-0.2	-1	-0.5	0.8	3.0	0.1	0.6	0.2	0.06	0.2	-0.1	0.3	-0.1	0.3	-0.05	0.3
13JC_C121	2	0.3	-0.2	-1	-0.5	5.9	14.4	2.1	10.8	2.8	0.84	2.7	0.4	2.1	0.3	0.8	0.08	0.6
14JC-C061	2	0.3	-99	-1	-0.5	2.1	1.9	0.2	1.2	0.2	-0.05	0.1	-0.1	-0.1	-0.1	-0.1	-0.05	0.1
14JC-C062	-2	0.3	-99	-1	-0.5	2.4	3.4	0.4	2.2	0.6	0.20	0.7	-0.1	0.7	0.1	0.3	-0.05	0.3
14JC-C063	-2	-0.2	-99	-1	-0.5	2.3	3.8	0.4	1.8	0.5	0.15	0.5	-0.1	0.6	-0.1	0.4	-0.05	0.3
14JC-C064	-2	0.5	-99	-1	-0.5	4.0	17.2	1.0	4.7	1.4	0.49	1.8	0.3	2.2	0.4	1.2	0.16	1.1
14JC-C065	-2	0.2	-99	-1	-0.5	2.2	5.7	0.5	2.3	0.7	0.29	1.2	0.2	2.0	0.5	1.6	0.23	1.5
14JC-C066	3	-0.2	-99	-1	1.1	35.6	64.6	7.9	31.9	6.2	1.90	6.7	0.9	5.6	1.1	3.3	0.46	3.0
14JC-C068	-2	0.3	-99	-1	-0.5	6.0	16.8	1.4	4.6	0.7	0.22	0.7	0.1	0.5	-0.1	0.2	-0.05	0.2
14JC-C072	-2	0.3	-99	-1	-0.5	8.2	10.1	2.8	13.4	2.5	0.60	1.5	0.2	0.8	0.1	0.3	-0.05	0.3
14JC-C067	-2	0.2	-99	-1	-0.5	2.6	3.4	0.3	1.3	0.2	0.05	0.3	-0.1	0.3	-0.1	0.3	-0.05	0.2
14JC-C069	-2	-0.2	-99	-1	-0.5	2.4	9.7	0.6	2.6	0.8	0.23	1.0	0.2	1.1	0.2	0.7	0.07	0.4
14JC-C070	-2	-0.2	-99	-1	-0.5	2.8	7.9	0.4	2.1	0.5	0.15	0.6	-0.1	0.6	-0.1	0.4	-0.05	0.4
14JC-C071	4	-0.2	-99	1	-0.5	2.4	6.0	0.8	3.7	1.1	0.47	1.4	0.2	1.3	0.2	0.8	0.10	0.8
14JC-C073	-2	-0.2	-99	-1	-0.5	3.3	7.3	0.7	2.7	0.6	0.15	0.7	-0.1	0.6	0.1	0.4	-0.05	0.1

Appendix C: Major- and trace-element data for drillcore samples

Sample_Num	Lu	Hf	Ta	W	Tl	Bi	Th	U	Remarks
Method	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	
Detection Limit	0.05	0.2	0.5	1	0.1	0.4	0.1	0.1	
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
13JC_C99	-0.05	-0.2	0.8	-99	-0.1	-0.4	0.1	0.4	
13JC_C100	-0.05	-0.2	2.9	-99	-0.1	1.3	-0.1	2.6	
13JC_C101	-0.05	-0.2	4.1	-99	-0.1	1.0	-0.1	0.3	
13JC_C102	-0.05	0.3	0.7	-99	-0.1	0.6	-0.1	0.3	
13JC_C104	-0.05	0.3	4.9	-99	-0.1	0.6	-0.1	0.4	
13JC_C106	-0.05	-0.2	4.3	-99	-0.1	1.1	0.2	0.7	
13JC_C107	-0.05	0.4	3.3	-99	-0.1	1.3	0.2	0.2	
13JC_C108	0.09	0.4	1.6	-99	-0.1	0.7	0.4	0.2	
13JC_C109	-0.05	0.3	-0.5	-99	-0.1	-0.4	0.1	0.1	
13JC_C111	0.09	0.6	2.2	-99	-0.1	-0.4	0.5	0.2	
13JC_C115	0.19	1.7	1.2	-99	-0.1	0.5	1.8	0.7	
13JC_C116	0.05	0.3	3.4	-99	-0.1	0.4	0.1	0.6	
13JC_C117	0.23	3.0	2.0	-99	-0.1	-0.4	2.1	0.4	
13JC_C118	0.57	5.2	3.7	-99	-0.1	0.6	5.2	2.3	
13JC_C120	-0.05	0.5	1.6	-99	-0.1	1.1	0.7	0.4	
13JC_C121	0.06	-0.2	2.5	-99	-0.1	0.7	0.3	0.2	
14JC-C061	-0.05	-0.2	5.5	-99	-0.1	0.6	-0.1	-0.1	
14JC-C062	-0.05	-0.2	2.0	-99	-0.1	0.6	0.2	0.9	
14JC-C063	0.07	-0.2	0.7	-99	-0.1	-0.4	-0.1	0.6	
14JC-C064	0.16	0.3	0.6	-99	-0.1	1.7	0.6	1.6	
14JC-C065	0.22	0.3	1.0	-99	-0.1	0.7	0.2	1.4	
14JC-C066	0.46	0.6	-0.5	-99	-0.1	-0.4	0.6	3.4	
14JC-C068	0.06	0.2	1.2	-99	-0.1	0.5	0.6	0.2	
14JC-C072	0.07	-0.2	2.9	-99	-0.1	0.9	-0.1	0.2	
14JC-C067	-0.05	-0.2	6.8	-99	-0.1	-0.4	-0.1	0.2	
14JC-C069	-0.05	-0.2	4.8	-99	-0.1	-0.4	-0.1	1.6	
14JC-C070	-0.05	-0.2	-0.5	-99	-0.1	-0.4	-0.1	1.8	
14JC-C071	0.07	-0.2	0.5	-99	-0.1	-0.4	-0.1	4.0	
14JC-C073	-0.05	0.3	5.2	-99	-0.1	-0.4	-0.1	-0.1	

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Appendix D: Major- and trace-element data for drill-cuttings samples

Sample_Num Method Detection Limit Unit	Lab_Num	Showing	DDH_ID	From_m	To_m	SiO2	Al2O3	Fe2O3 Total	Fe2O3	FeO	MgO	CaO	Na2O	K2O
						OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS
						0.01 %	0.01 %	0.01 %	0.01 %	0.01 %	0.01 %	0.01 %	0.01 %	0.01 %
Joy-12-96 0-3	10440619	Joyce Lake	JOY-12-96	0	3	50.09	0.19	46.14	-99	-99	-0.01	0.01	0.03	0.06
Joy-12-96 3-6	10440621	Joyce Lake	JOY-12-96	3	6	36.33	0.19	59.02	-99	-99	0.01	0.02	0.02	0.02
Joy-12-96 6-9	10440622	Joyce Lake	JOY-12-96	6	9	33.26	0.20	62.99	-99	-99	-0.01	0.02	0.02	0.02
Joy-12-96 9-12	10440623	Joyce Lake	JOY-12-96	9	12	49.43	0.20	49.06	-99	-99	-0.01	0.01	0.02	0.02
Joy-12-96 12-15	10440624	Joyce Lake	JOY-12-96	12	15	40.11	0.27	56.18	-99	-99	-0.01	0.01	0.03	0.04
Joy-12-96 15-18	10440625	Joyce Lake	JOY-12-96	15	18	37.37	0.32	59.10	-99	-99	0.01	0.02	0.03	0.03
Joy-12-96 18-21	10440626	Joyce Lake	JOY-12-96	18	21	26.04	0.25	70.99	-99	-99	-0.01	0.02	0.02	0.02
Joy-12-96 21-24	10440627	Joyce Lake	JOY-12-96	21	24	32.92	0.21	64.51	-99	-99	-0.01	0.02	0.02	0.02
Joy-12-96 24-27	10440628	Joyce Lake	JOY-12-96	24	27	22.98	0.35	74.15	-99	-99	0.01	0.02	0.02	0.02
Joy-12-96 27-30	10440629	Joyce Lake	JOY-12-96	27	30	30.58	0.33	66.66	-99	-99	-0.01	0.02	-0.01	-0.01
Joy-12-96 30-33	10440631	Joyce Lake	JOY-12-96	30	33	33.56	0.39	59.14	-99	-99	-0.01	0.02	0.05	0.05
Joy-12-96 33-36	10440632	Joyce Lake	JOY-12-96	33	36	32.45	0.30	65.25	-99	-99	-0.01	0.02	0.02	0.06
Joy-12-96 36-39	10440633	Joyce Lake	JOY-12-96	36	39	35.82	0.28	60.50	-99	-99	0.01	0.02	0.02	0.03
Joy-12-96 39-42	10440634	Joyce Lake	JOY-12-96	39	42	40.88	1.20	54.43	-99	-99	0.04	0.03	0.06	0.06
Joy-12-96 42-45	10440635	Joyce Lake	JOY-12-96	42	45	41.77	0.61	54.84	-99	-99	0.02	0.02	0.02	0.03
Joy-12-96 45-48	10440636	Joyce Lake	JOY-12-96	45	48	44.52	0.38	53.59	-99	-99	0.02	0.03	0.02	0.03
Joy-12-96 48-51	10440637	Joyce Lake	JOY-12-96	48	51	52.59	0.31	45.20	-99	-99	0.03	0.02	0.02	0.03
Joy-12-96 51-54	10440638	Joyce Lake	JOY-12-96	51	54	38.49	0.40	58.56	-99	-99	0.02	0.02	0.04	0.08
Joy-12-96 54-57	10440639	Joyce Lake	JOY-12-96	54	57	35.59	0.49	58.67	-99	-99	0.03	0.03	0.04	0.12
Joy-12-96 57-60	10440641	Joyce Lake	JOY-12-96	57	60	34.53	0.46	62.43	-99	-99	0.02	0.03	-0.01	0.08
Joy-12-96 60-63	10440642	Joyce Lake	JOY-12-96	60	63	21.19	0.54	74.97	-99	-99	0.04	0.03	-0.01	0.03
Joy-12-96 63-66	10440643	Joyce Lake	JOY-12-96	63	66	38.50	0.35	59.25	-99	-99	0.03	0.02	-0.01	0.01
Joy-12-96 66-69	10440644	Joyce Lake	JOY-12-96	66	69	36.34	0.42	62.30	-99	-99	0.02	0.02	0.01	0.01
Joy-12-96 69-72	10440645	Joyce Lake	JOY-12-96	69	72	8.41	0.77	88.39	-99	-99	0.03	0.02	0.04	0.06
Joy-12-96 72-75	10440646	Joyce Lake	JOY-12-96	72	75	11.79	0.58	83.90	-99	-99	0.03	0.03	0.02	0.07
Joy-12-96 75-78	10440647	Joyce Lake	JOY-12-96	75	78	18.77	0.71	78.53	-99	-99	0.02	0.03	0.03	0.06
Joy-12-96 78-81	10440648	Joyce Lake	JOY-12-96	78	81	26.69	0.61	72.01	-99	-99	0.01	0.03	0.04	0.06
Joy-12-96 81-84	10440649	Joyce Lake	JOY-12-96	81	84	35.69	0.52	61.95	-99	-99	0.02	0.02	0.01	0.02
Joy-12-96 84-87	10440651	Joyce Lake	JOY-12-96	84	87	37.38	2.33	56.28	-99	-99	0.07	0.03	0.03	0.01
Joy-12-96 87-90	10440652	Joyce Lake	JOY-12-96	87	90	39.31	0.87	56.29	-99	-99	0.02	0.03	0.01	0.02
Joy-12-96 90-93	10440653	Joyce Lake	JOY-12-96	90	93	37.87	0.81	57.97	-99	-99	0.02	0.02	0.02	0.04
Joy-12-96 93-96	10440654	Joyce Lake	JOY-12-96	93	96	38.26	0.71	60.25	-99	-99	0.01	0.02	0.01	0.02
Joy-12-96 96-99	10440655	Joyce Lake	JOY-12-96	96	99	42.61	0.56	55.67	-99	-99	0.02	0.02	0.01	0.02
Joy-12-96 99-102	10440656	Joyce Lake	JOY-12-96	99	102	36.88	0.38	59.00	-99	-99	-0.01	0.02	-0.01	-0.01
Joy-12-96 102-103.5	10440657	Joyce Lake	JOY-12-96	102	103.5	38.57	0.20	56.14	-99	-99	0.01	0.02	0.01	0.01
Joy-12-71A 0-3	10440658	Joyce Lake	JOY-12-71A	0	3	50.05	9.31	30.90	-99	-99	1.18	0.27	1.37	2.20
Joy-12-71A 3-6	10440659	Joyce Lake	JOY-12-71A	3	6	58.07	10.49	19.01	-99	-99	1.67	0.57	1.21	2.05
Joy-12-71A 6-9	10440661	Joyce Lake	JOY-12-71A	6	9	3.53	0.72	89.96	-99	-99	0.04	0.03	0.01	0.03
Joy-12-71A 9-12	10440662	Joyce Lake	JOY-12-71A	9	12	7.60	0.82	89.07	-99	-99	0.03	0.03	0.03	0.07
Joy-12-71A 12-15	10440663	Joyce Lake	JOY-12-71A	12	15	7.34	0.52	87.52	-99	-99	0.02	0.03	0.02	0.01
Joy-12-71A 15-18	10440664	Joyce Lake	JOY-12-71A	15	18	1.21	0.34	95.41	-99	-99	-0.01	0.02	0.05	0.06
Joy-12-71A 18-21	10440665	Joyce Lake	JOY-12-71A	18	21	1.67	0.36	94.73	-99	-99	-0.01	0.03	0.06	0.05

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Appendix D: Major- and trace-element data for drill-cuttings samples

Sample_Num Method Detection Limit Unit	Lab_Num	Showing	DDH_ID	From_m	To_m	SiO2	Al2O3	Fe2O3 Total	Fe2O3	FeO	MgO	CaO	Na2O	K2O
						OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS
						0.01 %	0.01 %	0.01 %	0.01 %	0.01 %	0.01 %	0.01 %	0.01 %	0.01 %
Joy-12-71A 21-24	10440666	Joyce Lake	JOY-12-71A	21	24	3.51	0.78	90.90	-99	-99	0.07	0.04	0.07	0.12
Joy-12-71A 24-27	10440667	Joyce Lake	JOY-12-71A	24	27	1.43	0.40	94.37	-99	-99	0.02	0.03	0.01	0.04
Joy-12-71A 27-30	10440668	Joyce Lake	JOY-12-71A	27	30	0.76	0.30	78.36	-99	-99	0.02	0.04	0.05	0.62
Joy-12-71A 30-33	10440669	Joyce Lake	JOY-12-71A	30	33	9.34	0.30	80.02	-99	-99	0.01	0.03	0.02	0.14
Joy-12-71A 33-36	10440671	Joyce Lake	JOY-12-71A	33	36	28.26	0.37	59.79	-99	-99	0.02	0.03	0.03	0.22
Joy-12-71A 36-39	10440672	Joyce Lake	JOY-12-71A	36	39	14.66	1.48	77.89	-99	-99	0.02	0.03	0.02	0.07
Joy-12-71A 39-42	10440673	Joyce Lake	JOY-12-71A	39	42	3.19	1.03	91.70	-99	-99	0.02	0.04	0.04	0.09
Joy-12-71A 42-45	10440674	Joyce Lake	JOY-12-71A	42	45	1.67	0.57	90.79	-99	-99	0.02	0.03	0.03	0.14
Joy-12-71A 45-48	10440675	Joyce Lake	JOY-12-71A	45	48	9.91	0.75	85.29	-99	-99	0.02	0.03	0.02	0.06
Joy-12-71A 48-51	10440676	Joyce Lake	JOY-12-71A	48	51	2.18	0.98	91.19	-99	-99	0.02	0.03	0.01	0.05
Joy-12-71A 51-54	10440677	Joyce Lake	JOY-12-71A	51	54	3.09	0.90	92.21	-99	-99	0.02	0.02	0.01	0.04
Joy-12-71A 54-57	10440678	Joyce Lake	JOY-12-71A	54	57	29.07	0.71	67.79	-99	-99	0.03	0.02	0.02	0.05
Joy-12-71A 57-60	10440679	Joyce Lake	JOY-12-71A	57	60	28.28	0.59	67.28	-99	-99	0.04	0.02	0.02	0.06
Joy-12-71A 60-63	10440681	Joyce Lake	JOY-12-71A	60	63	35.57	0.69	59.82	-99	-99	0.04	0.03	0.01	0.04
Joy-12-71A 63-66	10440682	Joyce Lake	JOY-12-71A	63	66	39.57	0.60	55.21	-99	-99	0.02	0.02	0.02	0.10
Joy-12-71A 66-69	10440683	Joyce Lake	JOY-12-71A	66	69	42.49	1.14	50.18	-99	-99	0.03	0.03	0.01	0.18
Joy-12-71A 69-72	10440684	Joyce Lake	JOY-12-71A	69	72	37.57	0.95	58.69	-99	-99	0.03	0.03	0.01	0.06
Joy-12-71A 72-75	10440685	Joyce Lake	JOY-12-71A	72	75	34.99	0.34	60.40	-99	-99	0.03	0.02	0.02	0.16
Joy-12-71A 75-78	10440686	Joyce Lake	JOY-12-71A	75	78	42.04	0.36	56.82	-99	-99	0.01	0.01	0.02	0.06
Joy-12-71A 78-81	10440687	Joyce Lake	JOY-12-71A	78	81	45.47	1.46	49.78	-99	-99	0.02	0.02	0.01	0.04
Joy-12-71A 81-84	10440688	Joyce Lake	JOY-12-71A	81	84	52.91	0.99	43.23	-99	-99	0.01	0.02	0.01	0.04
Joy-12-71A 84-87	10440689	Joyce Lake	JOY-12-71A	84	87	42.66	0.77	52.19	-99	-99	0.01	0.02	0.02	0.03
Joy-12-71A 87-90	10440691	Joyce Lake	JOY-12-71A	87	90	41.01	1.95	52.95	-99	-99	0.03	0.03	0.02	0.04

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Appendix D: Major- and trace-element data for drill-cuttings samples

Sample_Num Method Detection Limit Unit	TiO2	MnO	P2O5	Cr	Zr	Ba	LOI	Total	Fe	As	Be	Cu	Li	Mn	Ni	Pb	Rb
	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	Grav		Calculated	OES	OES	OES	OES	OES	OES	OES	OES
	0.001	0.001	0.001	1	1	1	0.01		na	2	0.1	1	0.1	1	1	1	1
	%	%	%	ppm	ppm	ppm	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Joy-12-96 0-3	0.003	0.197	0.077	6	15	11	2.34	99.16	32.27	-99	1.3	4	2.4	1268	30	-1	2
Joy-12-96 3-6	0.003	0.252	0.129	3	15	12	2.48	98.48	41.29	-99	2.0	4	1.7	1605	37	-1	4
Joy-12-96 6-9	0.003	0.449	0.109	3	15	93	1.49	98.57	44.06	-99	1.9	7	5.4	3001	37	1	4
Joy-12-96 9-12	0.003	0.298	0.096	3	12	91	1.49	100.64	34.32	-99	1.6	4	3.1	2043	31	1	2
Joy-12-96 12-15	0.003	0.422	0.115	5	15	84	1.09	98.29	39.30	-99	1.8	5	5.5	2665	36	4	4
Joy-12-96 15-18	0.004	0.413	0.070	5	15	80	1.75	99.11	41.34	-99	1.7	10	29.6	2920	45	-1	3
Joy-12-96 18-21	0.004	0.278	0.103	7	17	21	1.32	99.05	49.65	-99	2.2	6	10.1	1791	40	-1	2
Joy-12-96 21-24	0.005	0.182	0.080	8	16	17	1.39	99.36	45.13	-99	1.4	5	4.1	1078	33	-1	4
Joy-12-96 24-27	0.003	0.367	0.148	6	18	23	1.57	99.64	51.87	-99	2.6	5	2.4	2309	41	-1	2
Joy-12-96 27-30	0.002	0.498	0.128	4	14	39	1.22	99.45	46.63	-99	2.3	5	2.9	3229	41	2	4
Joy-12-96 30-33	0.004	0.404	0.102	5	-1	32	1.47	95.19	41.37	-99	1.9	7	5.9	2749	37	2	2
Joy-12-96 33-36	0.004	0.333	0.118	4	16	28	1.07	99.63	45.64	-99	2.3	4	4.6	2199	38	-1	4
Joy-12-96 36-39	0.004	0.322	0.088	7	17	37	1.11	98.21	42.32	-99	2.0	4	4.5	1714	35	1	4
Joy-12-96 39-42	0.031	0.267	0.085	11	40	135	1.21	98.28	38.08	-99	1.7	5	8.6	1767	34	1	3
Joy-12-96 42-45	0.019	0.477	0.104	9	26	405	0.97	98.88	38.36	-99	1.7	5	3.0	2858	35	2	4
Joy-12-96 45-48	0.008	0.647	0.069	8	17	371	0.89	100.20	37.48	-99	1.7	5	5.5	4357	35	2	1
Joy-12-96 48-51	0.008	0.209	0.041	10	16	126	0.61	99.07	31.62	-99	1.1	4	4.6	1379	30	3	2
Joy-12-96 51-54	0.015	1.176	0.057	22	21	1051	0.93	99.79	40.97	-99	1.9	6	2.6	8039	37	2	4
Joy-12-96 54-57	0.019	1.991	0.078	11	25	943	0.99	98.05	41.04	-99	1.9	6	2.8	11828	36	3	6
Joy-12-96 57-60	0.029	2.222	0.079	10	29	926	1.04	100.94	43.67	-99	2.0	6	2.0	14489	38	4	6
Joy-12-96 60-63	0.032	1.487	0.072	8	27	1024	0.96	99.37	52.44	-99	1.9	6	2.7	9249	42	4	5
Joy-12-96 63-66	0.011	0.799	0.071	8	19	470	0.81	99.86	41.44	-99	1.6	5	3.5	5201	36	3	4
Joy-12-96 66-69	0.022	0.387	0.078	9	22	55	0.76	100.36	43.58	-99	1.3	4	2.8	2392	38	-1	6
Joy-12-96 69-72	0.068	0.752	0.093	12	50	98	0.99	99.63	61.83	-99	2.0	5	2.5	4536	49	2	6
Joy-12-96 72-75	0.033	1.348	0.133	7	37	196	1.03	98.96	58.69	-99	2.6	6	2.0	7520	48	4	6
Joy-12-96 75-78	0.030	0.525	0.118	7	33	46	1.06	99.87	54.93	-99	1.9	5	1.5	3392	43	1	5
Joy-12-96 78-81	0.029	0.443	0.093	9	-1	43	0.92	100.94	50.37	-99	1.9	5	1.6	2740	43	3	7
Joy-12-96 81-84	0.038	0.631	0.102	9	27	190	0.96	99.96	43.33	-99	1.8	6	3.4	4097	39	2	4
Joy-12-96 84-87	0.269	0.528	0.152	15	59	133	1.54	98.62	39.36	-99	1.6	4	3.5	3516	37	1	6
Joy-12-96 87-90	0.113	0.540	0.107	12	31	92	1.13	98.44	39.37	-99	1.7	7	4.5	3591	37	2	5
Joy-12-96 90-93	0.118	0.413	0.117	8	30	49	1.03	98.44	40.55	-99	1.7	4	2.1	2720	37	1	6
Joy-12-96 93-96	0.090	0.381	0.103	11	33	89	0.93	100.79	42.14	-99	1.7	4	1.6	2481	37	2	6
Joy-12-96 96-99	0.035	0.320	0.094	8	28	33	0.84	100.21	38.94	-99	1.6	5	1.9	2132	35	3	4
Joy-12-96 99-102	0.024	0.280	0.221	13	24	28	2.81	99.65	41.27	-99	2.2	5	1.1	1832	41	7	4
Joy-12-96 102-103.5	0.011	0.185	0.129	15	17	25	4.71	100.00	39.27	-99	1.3	4	2.0	1169	38	1	-1
Joy-12-71A 0-3	0.425	0.314	0.118	55	137	447	3.45	99.58	21.61	-99	1.8	33	29.7	2199	43	8	65
Joy-12-71A 3-6	0.539	0.229	0.133	68	161	478	4.19	98.16	13.30	-99	1.9	38	31.1	1652	53	11	71
Joy-12-71A 6-9	0.028	0.419	0.172	22	36	35	3.37	98.32	62.93	-99	1.8	7	1.1	2494	47	-1	8
Joy-12-71A 9-12	0.031	0.442	0.170	21	39	41	2.48	100.77	62.30	-99	1.6	7	1.1	2735	47	2	6
Joy-12-71A 12-15	0.015	0.312	0.176	13	28	39	3.06	99.02	61.22	-99	1.5	5	0.9	1879	43	-1	6
Joy-12-71A 15-18	0.006	0.359	0.086	4	-1	27	1.00	98.55	66.74	-99	0.8	4	1.1	2130	33	1	4
Joy-12-71A 18-21	0.007	0.363	0.103	6	31	28	0.98	98.35	66.26	-99	1.2	6	0.6	2155	43	1	6

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Appendix D: Major- and trace-element data for drill-cuttings samples

Sample_Num	TiO2	MnO	P2O5	Cr	Zr	Ba	LOI	Total	Fe	As	Be	Cu	Li	Mn	Ni	Pb	Rb
Method	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	Grav		Calculated	OES	OES	OES	OES	OES	OES	OES	OES
Detection Limit	0.001	0.001	0.001	1	1	1	0.01		na	2	0.1	1	0.1	1	1	1	1
Unit	%	%	%	ppm	ppm	ppm	%	%	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Joy-12-71A 21-24	0.023	0.690	0.131	10	29	83	2.18	98.52	63.58	-99	1.2	8	5.5	4483	43	3	9
Joy-12-71A 24-27	0.008	0.928	0.107	6	27	50	1.62	98.97	66.01	-99	1.0	6	3.1	5234	39	3	5
Joy-12-71A 27-30	0.009	14.083	0.197	5	25	102	5.38	99.83	54.81	-99	0.9	5	5.0	59926	38	12	10
Joy-12-71A 30-33	0.007	4.219	0.148	6	23	1130	5.33	99.57	55.97	-99	1.1	5	4.8	26731	48	5	3
Joy-12-71A 33-36	0.009	4.809	0.153	6	19	497	5.20	98.90	41.82	-99	1.2	4	6.0	28537	42	5	7
Joy-12-71A 36-39	0.035	1.744	0.224	7	49	169	4.17	100.34	54.48	-99	1.8	5	5.2	10363	46	4	8
Joy-12-71A 39-42	0.030	1.674	0.226	7	60	170	2.04	100.09	64.15	-99	2.0	6	2.0	10134	52	5	7
Joy-12-71A 42-45	0.023	3.205	0.165	7	33	122	1.61	98.26	63.51	-99	1.6	6	0.9	19689	50	5	7
Joy-12-71A 45-48	0.038	2.022	0.175	10	42	194	1.53	99.85	59.66	-99	1.7	6	1.7	12109	50	4	8
Joy-12-71A 48-51	0.050	1.823	0.143	14	49	103	1.58	98.04	63.79	-99	1.4	6	1.4	11381	49	4	7
Joy-12-71A 51-54	0.046	1.370	0.136	8	47	109	1.51	99.35	64.50	-99	1.5	6	1.1	8082	52	3	6
Joy-12-71A 54-57	0.043	1.152	0.138	8	35	167	1.47	100.51	47.42	-99	1.1	6	3.3	7742	43	4	3
Joy-12-71A 57-60	0.042	1.066	0.096	11	28	80	1.20	98.68	47.06	-99	1.0	6	3.7	6797	42	3	4
Joy-12-71A 60-63	0.041	0.491	0.104	10	30	75	1.19	98.02	41.84	-99	0.9	6	3.8	3400	40	3	5
Joy-12-71A 63-66	0.050	1.763	0.180	13	30	122	1.40	98.94	38.62	-99	1.1	5	2.3	11274	39	4	6
Joy-12-71A 66-69	0.119	2.915	0.154	15	37	78	1.80	99.04	35.10	-99	1.3	5	5.3	20464	38	7	5
Joy-12-71A 69-72	0.124	0.672	0.125	18	34	40	1.38	99.63	41.05	-99	1.5	5	3.1	4649	42	3	5
Joy-12-71A 72-75	0.021	3.313	0.129	12	21	217	1.37	100.81	42.25	-99	1.2	4	3.2	19487	40	5	5
Joy-12-71A 75-78	0.032	0.393	0.097	9	22	43	0.71	100.56	39.75	-99	1.1	6	2.2	2476	36	4	2
Joy-12-71A 78-81	0.194	0.128	0.203	16	43	37	1.27	98.60	34.82	-99	1.7	10	3.0	845	36	7	2
Joy-12-71A 81-84	0.084	0.086	0.190	14	36	30	1.03	98.60	30.24	-99	1.8	13	3.3	581	32	7	3
Joy-12-71A 84-87	0.057	0.186	0.323	18	31	27	4.36	100.62	36.51	-99	6.4	25	2.6	1221	63	19	2
Joy-12-71A 87-90	0.171	0.088	0.259	22	44	98	1.82	98.36	37.04	-99	3.0	13	6.9	525	46	33	3

Open File: LAB/1646
Appendix D: Major- and trace-element data for drill-cuttings samples

Sample_Num	Sc	Ti	Zn	V	Co	Ga	Ge	As	Sr	Y	Nb	Mo	Cd	In	Sn
Method	OES	OES	OES	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS
Detection Limit	0.1	1	1	5	1	1	1	5	1	1	1	2	0.2	0.2	1
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Joy-12-96 0-3	0.5	7	22	38	4	1	19	16	5	7	2	3	-99	-0.2	-1
Joy-12-96 3-6	0.9	5	27	45	4	3	16	22	6	8	2	4	-99	-0.2	-1
Joy-12-96 6-9	0.9	19	29	42	6	2	16	21	8	8	1	5	-99	-0.2	-1
Joy-12-96 9-12	0.7	4	22	38	4	2	14	21	6	7	1	4	-99	-0.2	-1
Joy-12-96 12-15	0.9	4	27	50	6	2	17	28	9	11	1	5	-99	-0.2	-1
Joy-12-96 15-18	0.3	14	46	36	26	2	17	12	9	9	3	5	-99	-0.2	-1
Joy-12-96 18-21	0.3	4	31	41	7	2	23	15	11	8	2	7	-99	-0.2	1
Joy-12-96 21-24	0.2	15	25	40	4	2	22	11	8	7	2	6	-99	-0.2	1
Joy-12-96 24-27	0.3	-1	31	43	3	2	23	17	11	12	2	6	-99	-0.2	-1
Joy-12-96 27-30	0.6	-1	32	46	5	2	23	40	12	7	-1	3	-99	-0.2	-1
Joy-12-96 30-33	0.4	12	29	48	20	2	21	27	13	9	11	4	-99	-0.2	-1
Joy-12-96 33-36	0.5	9	29	48	6	2	21	21	10	9	2	4	-99	-0.2	2
Joy-12-96 36-39	0.2	9	26	47	3	3	23	16	10	8	1	5	-99	-0.2	1
Joy-12-96 39-42	0.7	160	26	51	4	3	19	14	30	17	3	4	-99	-0.2	1
Joy-12-96 42-45	0.4	75	27	76	6	2	18	18	34	12	5	5	-99	-0.2	-1
Joy-12-96 45-48	0.3	32	26	56	7	2	18	18	19	8	3	5	-99	-0.2	1
Joy-12-96 48-51	-0.1	38	22	57	5	2	16	12	7	17	3	5	-99	-0.2	1
Joy-12-96 51-54	0.1	70	28	68	6	2	22	20	11	14	12	9	-99	-0.2	-1
Joy-12-96 54-57	0.4	99	29	106	18	2	20	19	23	10	4	9	-99	-0.2	-1
Joy-12-96 57-60	0.7	156	33	128	26	2	19	29	20	12	4	8	-99	-0.2	-1
Joy-12-96 60-63	0.7	164	34	129	17	3	21	31	29	13	3	9	-99	-0.2	-1
Joy-12-96 63-66	0.4	47	28	78	7	2	18	26	11	9	4	7	-99	-0.2	-1
Joy-12-96 66-69	0.6	124	29	95	4	2	21	20	8	10	3	6	-99	-0.2	-1
Joy-12-96 69-72	1.1	347	40	182	14	3	22	29	15	16	10	7	-99	-0.2	1
Joy-12-96 72-75	1.0	159	39	160	18	4	26	32	19	17	4	8	-99	-0.2	-1
Joy-12-96 75-78	0.8	149	34	133	6	4	24	23	43	14	4	5	-99	-0.2	-1
Joy-12-96 78-81	1.0	147	33	128	9	3	21	20	17	15	6	5	-99	-0.2	-1
Joy-12-96 81-84	1.0	204	30	101	14	3	24	18	22	11	3	5	-99	-0.2	-1
Joy-12-96 84-87	3.2	1444	28	118	5	5	20	19	181	13	14	4	-99	-0.2	-1
Joy-12-96 87-90	2.0	652	29	106	7	3	18	22	25	11	4	5	-99	-0.2	-1
Joy-12-96 90-93	2.1	690	30	100	3	2	16	11	16	8	6	3	-99	-0.2	-1
Joy-12-96 93-96	1.8	532	28	116	4	2	18	16	21	9	5	5	-99	-0.2	-1
Joy-12-96 96-99	1.0	193	26	97	3	2	21	12	9	6	3	5	-99	-0.2	-1
Joy-12-96 99-102	0.7	127	35	80	6	2	17	17	7	11	3	4	-99	-0.2	-1
Joy-12-96 102-103.5	0.3	50	31	43	6	3	16	14	3	13	2	3	-99	-0.2	-1
Joy-12-71A 0-3	9.6	2068	178	97	11	13	10	10	78	20	11	3	-99	-0.2	2
Joy-12-71A 3-6	12.4	2849	112	132	16	15	6	15	75	20	18	4	-99	-0.2	2
Joy-12-71A 6-9	1.6	129	40	144	6	4	26	36	23	14	4	4	-99	-0.2	-1
Joy-12-71A 9-12	1.8	152	40	116	4	4	20	29	31	16	5	3	-99	-0.2	1
Joy-12-71A 12-15	1.0	70	35	70	5	3	21	29	27	12	3	4	-99	-0.2	-1
Joy-12-71A 15-18	0.4	17	24	52	4	3	21	19	23	10	8	5	-99	-0.2	-1
Joy-12-71A 18-21	0.5	22	33	54	5	3	21	33	18	12	6	6	-99	-0.2	-1

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Appendix D: Major- and trace-element data for drill-cuttings samples

Sample_Num	Sc	Ti	Zn	V	Co	Ga	Ge	As	Sr	Y	Nb	Mo	Cd	In	Sn
Method	OES	OES	OES	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS
Detection Limit	0.1	1	1	5	1	1	1	5	1	1	1	2	0.2	0.2	1
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Joy-12-71A 21-24	0.9	95	36	60	6	4	21	29	58	29	3	4	-99	-0.2	-1
Joy-12-71A 24-27	0.4	30	30	64	5	4	21	26	34	19	3	5	-99	-0.2	-1
Joy-12-71A 27-30	0.3	33	44	48	35	4	16	20	99	23	3	3	-99	-0.2	-1
Joy-12-71A 30-33	0.2	25	39	40	19	3	20	19	34	17	3	3	-99	-0.2	-1
Joy-12-71A 33-36	0.2	40	35	44	15	2	15	16	40	15	3	2	-99	-0.2	1
Joy-12-71A 36-39	1.0	191	41	63	11	4	16	22	211	26	4	2	-99	-0.2	-1
Joy-12-71A 39-42	0.7	144	42	89	21	4	19	22	151	24	8	3	-99	-0.2	1
Joy-12-71A 42-45	0.6	100	40	107	23	3	16	22	71	29	4	3	-99	-0.2	-1
Joy-12-71A 45-48	1.1	194	40	132	19	4	19	17	88	31	6	4	-99	-0.2	1
Joy-12-71A 48-51	1.3	252	39	145	17	4	16	19	49	29	10	4	-99	-0.2	-1
Joy-12-71A 51-54	1.2	234	41	155	18	4	16	22	53	28	9	5	-99	-0.2	-1
Joy-12-71A 54-57	1.1	248	33	105	10	3	11	16	41	25	7	3	-99	-0.2	-1
Joy-12-71A 57-60	0.9	245	34	92	10	2	13	16	15	20	4	3	-99	-0.2	-1
Joy-12-71A 60-63	1.0	239	30	91	8	2	11	14	20	19	4	3	-99	-0.2	-1
Joy-12-71A 63-66	1.2	292	31	160	10	3	13	26	102	18	6	4	-99	-0.2	-1
Joy-12-71A 66-69	2.4	690	34	185	13	4	9	21	71	17	6	3	-99	-0.2	-1
Joy-12-71A 69-72	2.7	753	32	220	9	3	10	16	18	15	4	3	-99	-0.2	-1
Joy-12-71A 72-75	0.5	116	32	136	2493	3	14	19	37	16	8	7	-99	-0.2	-1
Joy-12-71A 75-78	0.7	190	26	112	231	3	13	8	64	14	5	6	-99	-0.2	-1
Joy-12-71A 78-81	3.6	1166	28	257	3	6	13	13	319	21	8	4	-99	-0.2	-1
Joy-12-71A 81-84	2.4	546	26	238	3	5	12	14	267	20	6	3	-99	-0.2	-1
Joy-12-71A 84-87	1.4	336	62	142	12	5	10	26	104	38	4	5	-99	-0.2	-1
Joy-12-71A 87-90	3.6	915	35	240	3	7	17	13	220	29	6	9	-99	-0.2	1

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Appendix D: Major- and trace-element data for drill-cuttings samples

Sample_Num	Cs	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Method	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS
Detection Limit	0.5	0.5	0.5	0.1	0.2	0.1	0.05	0.1	0.1	0.1	0.1	0.1	0.05	0.1	0.05
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Joy-12-96 0-3	-0.5	5.8	12.6	1.3	5.5	1.1	0.34	1.2	0.2	1.1	0.2	0.6	0.08	0.5	0.05
Joy-12-96 3-6	-0.5	4.8	10.5	1.3	5.3	1.3	0.39	1.3	0.2	1.3	0.2	0.7	0.09	0.5	0.07
Joy-12-96 6-9	-0.5	3.9	14.5	1.1	4.8	1.2	0.38	1.5	0.2	1.3	0.2	0.7	0.10	0.5	0.07
Joy-12-96 9-12	-0.5	2.6	9.3	0.8	3.8	1.0	0.36	1.2	0.2	1.2	0.2	0.7	0.08	0.5	0.07
Joy-12-96 12-15	-0.5	4.5	16.2	1.4	6.0	1.6	0.50	1.8	0.3	1.7	0.3	1.0	0.12	0.7	0.09
Joy-12-96 15-18	-0.5	3.0	8.4	0.8	3.9	0.7	0.35	1.2	0.2	1.2	0.3	0.8	0.10	0.5	0.07
Joy-12-96 18-21	-0.5	4.5	12.5	1.7	7.7	1.9	0.50	1.7	0.2	1.5	0.3	0.7	0.09	0.6	0.08
Joy-12-96 21-24	-0.5	3.0	8.1	0.9	4.1	1.2	0.33	1.3	0.2	1.3	0.3	0.7	0.09	0.5	0.07
Joy-12-96 24-27	-0.5	4.9	11.8	1.5	7.0	1.8	0.55	1.9	0.3	1.8	0.4	1.0	0.13	0.8	0.09
Joy-12-96 27-30	-0.5	5.4	16.6	2.0	9.5	2.2	0.61	1.8	0.2	1.4	0.3	0.7	0.10	0.5	0.05
Joy-12-96 30-33	-0.5	8.9	17.7	3.1	13.7	2.9	0.80	2.5	0.3	1.7	0.3	0.8	0.10	0.5	0.08
Joy-12-96 33-36	-0.5	4.3	10.7	1.2	5.8	1.4	0.39	1.5	0.2	1.4	0.3	0.8	0.10	0.6	0.07
Joy-12-96 36-39	-0.5	4.8	11.9	1.3	5.9	1.5	0.41	1.4	0.2	1.4	0.3	0.7	0.10	0.6	0.07
Joy-12-96 39-42	-0.5	7.8	14.4	2.2	8.7	2.0	0.59	2.2	0.4	2.3	0.5	1.4	0.19	1.2	0.17
Joy-12-96 42-45	-0.5	6.5	13.3	1.6	6.9	1.8	0.49	1.8	0.3	1.8	0.4	1.2	0.16	1.0	0.13
Joy-12-96 45-48	-0.5	4.1	12.2	1.0	4.5	1.0	0.35	1.3	0.2	1.2	0.3	0.7	0.09	0.7	0.08
Joy-12-96 48-51	-0.5	3.6	8.8	1.1	4.6	1.1	0.44	1.8	0.3	2.1	0.5	1.5	0.17	1.1	0.13
Joy-12-96 51-54	-0.5	2.7	9.6	0.9	4.3	1.0	0.51	1.7	0.3	1.8	0.4	1.3	0.17	1.0	0.14
Joy-12-96 54-57	-0.5	10.3	17.3	2.2	9.1	1.8	0.61	2.0	0.3	1.6	0.3	1.1	0.15	0.8	0.12
Joy-12-96 57-60	-0.5	7.0	18.2	2.0	9.5	2.0	0.70	2.2	0.3	1.9	0.4	1.2	0.17	1.0	0.16
Joy-12-96 60-63	-0.5	7.2	19.3	2.4	11.5	2.3	0.77	2.7	0.3	2.4	0.5	1.3	0.19	1.2	0.14
Joy-12-96 63-66	-0.5	4.0	11.4	1.3	5.6	1.4	0.44	1.6	0.2	1.6	0.3	0.9	0.13	0.7	0.09
Joy-12-96 66-69	-0.5	2.8	9.5	1.0	4.6	1.1	0.38	1.4	0.2	1.5	0.3	0.9	0.12	0.8	0.12
Joy-12-96 69-72	-0.5	7.5	20.2	2.3	12.2	3.1	0.95	3.6	0.5	2.9	0.5	1.7	0.22	1.4	1.77
Joy-12-96 72-75	-0.5	9.6	23.0	2.8	14.5	5.0	1.75	6.7	0.7	3.6	0.7	1.8	0.23	1.4	0.19
Joy-12-96 75-78	-0.5	25.7	41.9	3.5	12.0	2.4	0.79	2.9	0.4	2.3	0.5	1.4	0.18	1.3	0.17
Joy-12-96 78-81	-0.5	7.9	17.9	2.1	10.3	2.2	0.72	2.9	0.4	2.5	0.5	1.5	0.19	1.3	0.18
Joy-12-96 81-84	-0.5	5.2	14.5	1.6	7.2	1.8	0.60	2.2	0.3	1.9	0.3	1.1	0.15	0.9	0.13
Joy-12-96 84-87	-0.5	35.6	64.8	6.0	19.6	3.0	0.72	3.0	0.4	2.3	0.5	1.4	0.19	1.3	0.20
Joy-12-96 87-90	-0.5	9.0	17.6	2.0	9.0	1.9	0.54	2.1	0.3	1.7	0.3	1.1	0.15	1.0	0.12
Joy-12-96 90-93	0.5	5.7	13.5	1.6	7.6	1.6	0.49	2.0	0.3	1.4	0.3	0.8	0.13	0.8	0.12
Joy-12-96 93-96	-0.5	8.4	17.5	2.1	8.5	2.0	0.65	2.0	0.3	1.5	0.3	0.9	0.13	0.9	0.13
Joy-12-96 96-99	0.6	4.8	12.3	1.6	7.1	1.6	0.49	1.6	0.2	1.1	0.2	0.7	0.10	0.7	0.11
Joy-12-96 99-102	-0.5	4.5	10.1	1.1	5.1	1.1	0.39	1.5	0.3	1.6	0.3	1.1	0.13	0.8	0.11
Joy-12-96 102-103.5	-0.5	3.9	9.6	1.1	4.6	1.2	0.39	1.7	0.3	1.6	0.3	1.1	0.14	0.9	0.12
Joy-12-71A 0-3	1.8	26.6	51.0	6.3	23.5	4.8	1.02	4.3	0.6	3.4	0.6	2.0	0.27	1.7	0.24
Joy-12-71A 3-6	0.9	30.8	59.1	6.9	26.0	5.0	1.10	4.5	0.6	3.7	0.7	2.2	0.29	1.9	0.29
Joy-12-71A 6-9	-0.5	9.6	13.7	2.1	10.1	2.5	0.79	3.6	0.5	2.5	0.5	1.1	0.14	0.9	0.13
Joy-12-71A 9-12	-0.5	8.1	15.1	2.3	11.0	3.0	0.95	3.7	0.5	2.8	0.5	1.4	0.18	1.0	0.12
Joy-12-71A 12-15	-0.5	5.2	11.7	1.7	8.8	2.5	0.71	2.6	0.4	2.0	0.4	1.1	0.16	0.8	0.11
Joy-12-71A 15-18	-0.5	8.6	17.3	2.0	8.2	2.0	0.60	1.9	0.3	1.8	0.4	1.0	0.12	0.6	0.09
Joy-12-71A 18-21	-0.5	5.1	12.3	1.5	6.8	1.7	0.52	2.0	0.3	2.0	0.4	1.1	0.13	0.8	0.13

Open File: LAB/1646

Appendix D: Major- and trace-element data for drill-cuttings samples

Sample_Num	Cs	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
Method	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS
Detection Limit	0.5	0.5	0.5	0.1	0.2	0.1	0.05	0.1	0.1	0.1	0.1	0.1	0.05	0.1	0.05
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Joy-12-71A 21-24	-0.5	16.3	36.8	4.6	21.7	5.0	1.48	5.5	0.8	5.2	1.0	2.5	0.27	1.6	0.15
Joy-12-71A 24-27	-0.5	9.8	22.1	2.7	12.1	3.2	0.91	3.5	0.5	3.2	0.6	1.7	0.21	1.0	0.12
Joy-12-71A 27-30	-0.5	15.8	33.3	4.5	19.9	4.4	1.29	4.5	0.6	3.6	0.8	2.1	0.23	1.1	0.16
Joy-12-71A 30-33	-0.5	11.4	31.0	2.7	11.8	2.3	0.71	2.5	0.4	2.5	0.5	1.6	0.19	1.2	0.15
Joy-12-71A 33-36	-0.5	9.0	15.9	2.2	10.0	2.1	0.66	2.6	0.4	2.2	0.4	1.4	0.18	1.0	0.13
Joy-12-71A 36-39	-0.5	29.4	46.4	5.0	20.3	3.6	1.14	3.9	0.6	3.8	0.8	2.3	0.29	1.7	0.22
Joy-12-71A 39-42	-0.5	16.5	34.2	3.5	15.6	3.4	1.13	4.1	0.6	3.8	0.7	2.2	0.29	1.6	0.24
Joy-12-71A 42-45	-0.5	9.3	25.3	2.6	12.5	3.2	1.03	4.1	0.6	3.9	0.7	2.5	0.31	1.9	0.22
Joy-12-71A 45-48	-0.5	8.6	19.6	2.5	11.8	3.4	1.12	4.4	0.7	4.9	0.9	2.6	0.33	2.1	0.30
Joy-12-71A 48-51	-0.5	7.8	18.8	1.9	8.9	2.4	0.84	3.4	0.6	4.0	0.8	2.6	0.42	2.3	0.36
Joy-12-71A 51-54	-0.5	9.3	19.5	2.0	8.6	2.3	0.96	3.6	0.6	3.7	0.8	2.5	0.45	2.3	0.36
Joy-12-71A 54-57	-0.5	6.5	13.4	1.8	9.4	2.3	0.83	2.9	0.4	3.0	0.7	2.2	0.28	1.9	0.25
Joy-12-71A 57-60	-0.5	3.7	8.0	1.0	4.4	1.2	0.49	2.0	0.3	2.2	0.5	1.7	0.27	1.7	0.20
Joy-12-71A 60-63	-0.5	5.0	12.2	1.5	6.4	1.5	0.59	2.1	0.3	2.5	0.5	1.8	0.25	1.6	0.19
Joy-12-71A 63-66	-0.5	19.2	38.3	3.5	13.5	2.2	0.75	2.8	0.4	2.6	0.6	1.7	0.24	1.4	0.20
Joy-12-71A 66-69	-0.5	7.7	17.9	1.7	7.2	1.5	0.44	1.9	0.3	2.2	0.4	1.7	0.22	1.7	0.18
Joy-12-71A 69-72	-0.5	2.9	7.1	0.7	3.1	0.9	0.30	1.3	0.3	1.8	0.4	1.5	0.20	1.5	0.16
Joy-12-71A 72-75	-0.5	5.3	11.2	1.3	5.1	1.8	0.53	1.8	0.3	2.0	0.5	1.5	0.34	1.4	0.30
Joy-12-71A 75-78	-0.5	4.2	8.9	1.1	4.5	1.2	0.44	1.5	0.3	1.9	0.4	1.3	0.20	1.1	0.17
Joy-12-71A 78-81	-0.5	22.1	51.8	6.1	25.1	5.2	1.47	4.6	0.6	3.5	0.6	2.0	0.26	1.9	0.25
Joy-12-71A 81-84	-0.5	13.9	33.5	3.8	16.5	3.3	1.12	3.6	0.5	2.9	0.6	2.0	0.25	1.9	0.24
Joy-12-71A 84-87	-0.5	10.0	22.8	2.6	11.9	3.0	0.84	3.4	0.6	4.1	1.0	3.4	0.47	2.9	0.37
Joy-12-71A 87-90	-0.5	18.5	41.5	4.9	22.4	3.9	1.29	4.6	0.6	3.9	0.9	2.7	0.36	2.3	0.34

Open File: LAB/1646

Appendix D: Major- and trace-element data for drill-cuttings samples

Sample_Num	Hf	Ta	W	Tl	Bi	Th	U	Remarks
Method	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	
Detection Limit	0.2	0.5	1	0.1	0.4	0.1	0.1	
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
Joy-12-96 0-3	-0.2	-0.5	2	-0.1	-0.4	0.2	1.1	
Joy-12-96 3-6	-0.2	-0.5	1	-0.1	-0.4	-0.1	1.6	
Joy-12-96 6-9	-0.2	-0.5	-1	-0.1	-0.4	-0.1	1.6	
Joy-12-96 9-12	-0.2	-0.5	-1	-0.1	-0.4	-0.1	1.4	
Joy-12-96 12-15	-0.2	-0.5	1	-0.1	0.6	-0.1	1.8	
Joy-12-96 15-18	-0.2	-0.5	2	-0.1	-0.4	0.1	0.7	
Joy-12-96 18-21	-0.2	-0.5	2	-0.1	-0.4	-0.1	1.2	
Joy-12-96 21-24	-0.2	-0.5	5	-0.1	-0.4	0.1	0.7	
Joy-12-96 24-27	-0.2	-0.5	1	-0.1	-0.4	-0.1	1.2	
Joy-12-96 27-30	-0.2	-0.5	-1	-0.1	-0.4	-0.1	2.1	
Joy-12-96 30-33	1.2	-0.5	1	-0.1	0.4	0.2	1.6	REFUSED AND REANALYZED
Joy-12-96 33-36	-0.2	-0.5	-1	-0.1	-0.4	0.1	1.7	
Joy-12-96 36-39	-0.2	-0.5	2	-0.1	-0.4	-0.1	1.3	
Joy-12-96 39-42	0.6	-0.5	2	-0.1	0.5	1.4	1.8	
Joy-12-96 42-45	0.2	-0.5	3	-0.1	-0.4	0.5	2.0	
Joy-12-96 45-48	-0.2	-0.5	2	-0.1	-0.4	0.3	2.1	
Joy-12-96 48-51	-0.2	-0.5	2	-0.1	-0.4	0.2	2.5	
Joy-12-96 51-54	0.8	-0.5	5	-0.1	-0.4	0.4	3.9	
Joy-12-96 54-57	-0.2	-0.5	3	-0.1	0.5	0.4	2.9	
Joy-12-96 57-60	-0.2	-0.5	1	-0.1	0.4	0.3	2.2	
Joy-12-96 60-63	0.2	-0.5	-1	-0.1	-0.4	0.3	2.5	
Joy-12-96 63-66	-0.2	-0.5	3	-0.1	0.5	0.1	1.6	
Joy-12-96 66-69	-0.2	-0.5	2	-0.1	-0.4	0.2	1.5	
Joy-12-96 69-72	1.7	-0.5	2	-0.1	-0.4	0.7	4.2	
Joy-12-96 72-75	0.3	-0.5	2	-0.1	-0.4	0.4	3.5	
Joy-12-96 75-78	0.3	-0.5	1	-0.1	-0.4	0.4	2.3	
Joy-12-96 78-81	1.2	1.4	1	-0.1	-0.4	0.3	2.7	
Joy-12-96 81-84	0.2	-0.5	1	-0.1	0.6	0.3	2.1	
Joy-12-96 84-87	1.1	0.7	2	-0.1	0.6	1.5	2.2	
Joy-12-96 87-90	0.4	-0.5	1	-0.1	0.5	0.4	2.0	
Joy-12-96 90-93	0.3	0.5	2	0.1	0.7	0.3	1.7	
Joy-12-96 93-96	0.4	-0.5	2	-0.1	-0.4	0.4	1.9	
Joy-12-96 96-99	0.3	-0.5	1	-0.1	0.4	0.3	1.5	
Joy-12-96 99-102	-0.2	-0.5	-1	-0.1	-0.4	0.2	1.5	
Joy-12-96 102-103.5	-0.2	-0.5	-1	-0.1	0.5	-0.1	0.6	
Joy-12-71A 0-3	3.1	0.6	2	-0.1	-0.4	6.8	3.4	
Joy-12-71A 3-6	4.6	0.8	13	-0.1	-0.4	7.4	3.7	
Joy-12-71A 6-9	0.3	-0.5	2	-0.1	-0.4	0.4	3.1	
Joy-12-71A 9-12	0.3	-0.5	2	-0.1	-0.4	0.6	3.1	
Joy-12-71A 12-15	-0.2	-0.5	2	-0.1	-0.4	0.3	2.1	
Joy-12-71A 15-18	1.0	-0.5	3	-0.1	-0.4	0.3	1.5	
Joy-12-71A 18-21	1.2	-0.5	3	-0.1	-0.4	0.2	2.0	

Appendix D: Major- and trace-element data for drill-cuttings samples

Sample_Num	Hf	Ta	W	Tl	Bi	Th	U	Remarks
Method	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	
Detection Limit	0.2	0.5	1	0.1	0.4	0.1	0.1	
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	
Joy-12-71A 21-24	-0.2	-0.5	2	-0.1	-0.4	0.4	2.1	
Joy-12-71A 24-27	-0.2	-0.5	3	-0.1	-0.4	0.2	1.6	
Joy-12-71A 27-30	-0.2	-0.5	2	-0.1	0.5	0.2	0.9	
Joy-12-71A 30-33	-0.2	-0.5	1	-0.1	-0.4	0.2	0.8	
Joy-12-71A 33-36	-0.2	-0.5	-1	-0.1	0.6	0.3	0.9	
Joy-12-71A 36-39	0.8	-0.5	-1	-0.1	-0.4	1.6	2.0	
Joy-12-71A 39-42	1.3	-0.5	-1	-0.1	-0.4	1.2	2.9	
Joy-12-71A 42-45	0.2	-0.5	2	-0.1	0.7	0.4	2.3	
Joy-12-71A 45-48	0.3	-0.5	-1	-0.1	-0.4	0.6	1.9	
Joy-12-71A 48-51	0.5	0.7	4	-0.1	-0.4	0.9	2.0	
Joy-12-71A 51-54	0.4	0.5	3	-0.1	-0.4	1.0	2.1	
Joy-12-71A 54-57	0.3	-0.5	3	-0.1	1.0	0.6	1.5	
Joy-12-71A 57-60	0.3	-0.5	2	-0.1	-0.4	0.3	1.6	
Joy-12-71A 60-63	0.3	-0.5	-1	-0.1	-0.4	0.4	1.5	
Joy-12-71A 63-66	0.3	0.8	2	-0.1	0.7	0.3	1.8	
Joy-12-71A 66-69	0.5	-0.5	1	-0.1	0.7	0.6	1.9	
Joy-12-71A 69-72	0.3	-0.5	-1	-0.1	-0.4	0.3	2.1	
Joy-12-71A 72-75	0.2	0.7	7	0.1	-0.4	0.4	1.8	
Joy-12-71A 75-78	-0.2	0.5	4	-0.1	-0.4	0.2	1.9	
Joy-12-71A 78-81	0.6	-0.5	3	-0.1	0.5	0.5	4.0	
Joy-12-71A 81-84	0.5	-0.5	2	-0.1	0.9	0.4	3.8	
Joy-12-71A 84-87	0.3	-0.5	2	-0.1	0.4	0.3	3.8	
Joy-12-71A 87-90	0.6	-0.5	2	-0.1	-0.4	0.5	3.6	

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Appendix E: Major-element ICP-OES-FUS standards and duplicate data

Lab Number Method Detection Limit Unit	Field Numbers	Year	SiO2	Al2O3	Fe2O3 Total	Fe2O3	FeO	MgO	CaO	Na2O	K2O	TiO2
			OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS
			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
			%	%	%	%	%	%	%	%	%	%
10440629	Joy-12-96 27-30	2012	30.58	0.33	66.66	-99	-99	-0.01	0.02	-0.01	-0.01	0.002
10440630	Joy-12-96 27-30 (Dup)	2012	30.01	0.33	66.25	-99	-99	-0.01	0.02	-0.01	-0.01	0.002
10440642	Joy-12-96 60-63	2012	21.19	0.54	74.97	-99	-99	0.04	0.03	-0.01	0.03	0.032
10440650	Joy-12-96 60-63 (Dup)	2012	21.02	0.54	74.51	-99	-99	0.04	0.04	-0.01	0.03	0.031
10440664	Joy-12-71A 15-18	2012	1.21	0.34	95.41	-99	-99	-0.01	0.02	0.05	0.06	0.006
10440670	Joy-12-71A 15-18 (Dup)	2012	1.24	0.35	96.20	-99	-99	-0.01	0.02	0.04	0.05	0.006
10440689	Joy-12-71A 84-87	2012	42.66	0.77	52.19	-99	-99	0.01	0.02	0.02	0.03	0.057
10440690	Joy-12-71A 84-87 (Dup)	2012	43.56	0.80	49.27	-99	-99	0.02	0.02	0.01	0.03	0.057
10440701	JC12-080	2012	45.10	15.94	13.50	-99	-99	6.82	7.58	2.98	0.47	1.791
10440710	JC12-080 (Dup)	2012	44.98	15.96	13.51	-99	-99	6.85	7.40	2.99	0.47	1.766
10440889	13JC085A01	2013	46.14	0.46	42.63	-99	-99	0.05	0.03	0.07	0.11	0.049
10440890	13JC085A01 (Dup)	2013	45.08	0.45	42.44	-99	-99	0.05	0.03	0.06	0.08	0.048
10440909	13JC_C99	2013	0.93	0.05	98.08	-99	-99	0.01	0.02	0.09	0.16	0.010
10440910	13JC_C99 (Dup)	2013	1.00	0.08	99.30	-99	-99	0.02	0.04	0.06	0.08	0.016
10441032	14JC-C066	2014	34.23	1.19	62.32	-99	-99	0.02	0.05	-0.01	-0.01	0.145
10441050	14JC-C066 (Dup)	2014	34.93	1.22	61.21	-99	-99	0.01	0.05	0.08	0.14	0.145
10440220	SCH-1	2012	8.18	0.98	87.60	-99	-99	0.04	0.04	0.04	0.04	0.045
10440240	AGV-1	2012	59.25	17.21	6.66	-99	-99	1.53	4.91	4.30	2.84	1.078
10440260	SCH-1	2012	8.09	0.96	86.85	-99	-99	0.04	0.04	0.04	0.05	0.044
10440280	SDC-1	2012	65.74	15.72	6.92	-99	-99	1.69	1.43	2.07	3.10	0.990
10440300	SCH-1	2012	7.95	0.96	86.93	-99	-99	0.04	0.04	0.04	0.05	0.043
10440320	STM-1	2012	59.00	18.22	5.24	-99	-99	0.10	1.15	8.87	4.17	0.131
10440340	SCH-1	2012	8.01	0.97	86.96	-99	-99	0.04	0.04	0.05	0.06	0.049
10440360	DR-N	2012	53.56	18.09	9.55	-99	-99	4.41	7.18	3.11	1.74	1.081
10440380	SCH-1	2012	7.98	0.95	84.53	-99	-99	0.04	0.04	0.03	0.02	0.044
10440400	MAG-1	2012	50.97	16.34	6.87	-99	-99	3.06	1.41	3.98	3.43	0.715
10440420	SCH-1	2012	8.01	0.95	86.34	-99	-99	0.04	0.04	0.03	0.03	0.050
10440440	BIR-1	2012	47.49	15.50	11.08	-99	-99	9.47	12.89	1.80	0.05	0.944
10440460	SCH-1	2012	8.10	0.98	87.15	-99	-99	0.04	0.04	0.04	0.04	0.046
10440480	SCH-1	2012	8.04	0.97	87.40	-99	-99	0.04	0.05	0.04	0.04	0.045
10440500	W-2	2012	51.98	15.35	11.11	-99	-99	6.43	10.82	2.27	0.63	1.074
10440520	SCH-1	2012	8.12	0.99	87.88	-99	-99	0.04	0.05	0.06	0.06	0.046
10440540	RGM-1	2012	72.01	13.38	1.87	-99	-99	0.27	1.19	4.04	4.10	0.250
10440560	SCH-1	2012	8.15	1.00	88.43	-99	-99	0.04	0.05	0.05	0.05	0.047
10440580	G-2	2012	67.75	15.16	2.80	-99	-99	0.74	1.90	4.03	3.92	0.481
10440600	SCH-1	2012	8.20	0.99	88.93	-99	-99	0.03	0.05	0.05	0.06	0.044
10440620	BHVO-1	2012	49.20	13.56	11.86	-99	-99	7.08	11.14	2.22	0.50	2.723
10440640	SCH-1	2012	8.32	0.99	88.47	-99	-99	0.04	0.04	0.03	0.03	0.045
10440660	QLO-1	2012	65.15	16.22	4.93	-99	-99	1.02	3.23	4.22	3.32	0.614

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Appendix E: Major-element ICP-OES-FUS standards and duplicate data

Lab Number Method Detection Limit Unit	Field Numbers	Year	SiO2	Al2O3	Fe2O3 Total	Fe2O3	FeO	MgO	CaO	Na2O	K2O	TiO2	
			OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS
			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.001
			%	%	%	%	%	%	%	%	%	%	%
10440680	SCH-1	2012	8.11	0.98	87.38	-99	-99	0.03	0.05	0.05	0.04	0.046	
10440700	AGV-1	2012	58.20	17.06	7.10	-99	-99	1.51	4.90	4.36	2.93	1.065	
10440720	STM-1	2013	59.50	18.34	5.32	-99	-99	0.10	1.15	8.91	4.30	0.133	
10440760	DR-N	2013	51.55	17.34	9.62	-99	-99	4.22	6.97	2.92	1.62	1.046	
10440780	SCH-1	2013	7.96	0.98	86.38	-99	-99	0.04	0.05	0.02	-0.01	0.047	
10440800	MAG-1	2013	50.96	16.38	7.28	-99	-99	3.06	1.42	3.84	3.32	0.714	
10440820	SCH-1	2013	8.02	0.98	84.17	-99	-99	0.03	0.04	0.03	-0.01	0.046	
10440840	BIR-1	2013	48.07	15.81	11.59	-99	-99	9.81	13.32	1.82	0.05	0.956	
10440860	SCH-1	2013	8.11	0.96	85.50	-99	-99	0.03	0.04	0.05	0.04	0.039	
10440880	W-2	2013	51.18	15.21	10.68	-99	-99	6.35	10.64	2.23	0.64	1.026	
10440900	SCH-1	2013	8.20	0.99	86.58	-99	-99	0.04	0.05	0.05	0.05	0.039	
10440920	RGM-1	2013	72.04	13.75	1.90	-99	-99	0.29	1.20	4.08	4.36	0.259	
10440940	SCH-1	2013	8.47	0.99	86.64	-99	-99	0.07	0.14	0.09	0.15	0.047	
10440960	MAG-1	2013	50.05	15.93	7.04	-99	-99	3.02	1.41	4.01	3.90	0.705	
10441040	SCH-1	2014	8.50	1.02	86.98	-99	-99	0.06	0.08	0.05	0.07	0.052	
10441060	G-2	2014	68.10	15.32	2.73	-99	-99	0.74	1.91	4.15	4.58	0.474	
10441080	SCH-1	2014	8.28	0.98	84.66	-99	-99	0.03	0.06	0.06	0.08	0.043	

*GOI - gain on ignition

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Appendix E: Major-element ICP-OES-FUS standards and duplicate data

Lab Number Method Detection Limit Unit	MnO OES-FUS 0.001 %	P2O5 OES-FUS 0.001 %	Cr OES-FUS 1 ppm	Zr OES-FUS 1 ppm	Ba OES-FUS 1 ppm	LOI Grav 0.01 %	Total %	Fe Calculated na %
10440629	0.498	0.128	4	14	39	1.22	99.45	46.63
10440630	0.493	0.127	4	19	37	1.25	98.49	46.34
10440642	1.487	0.072	8	27	1024	0.96	99.37	52.44
10440650	1.450	0.070	8	27	955	0.94	98.68	52.12
10440664	0.359	0.086	4	-1	27	1.00	98.55	66.74
10440670	0.379	0.089	5	-1	28	0.99	99.38	67.29
10440689	0.186	0.323	18	31	27	4.36	100.62	36.51
10440690	0.186	0.331	14	30	27	4.36	98.64	34.46
10440701	0.228	0.244	17	106	444	3.64	98.29	9.44
10440710	0.229	0.249	17	105	442	3.70	98.09	9.45
10440889	1.853	0.117	9	26	7	9.26	100.76	29.81
10440890	1.862	0.119	7	25	6	9.28	99.50	29.68
10440909	0.067	0.011	2	28	5	0.34	99.79	68.59
10440910	0.067	0.010	3	27	6	0.32	100.99	69.44
10441032	0.061	0.217	14	50	117	2.73	100.89	43.58
10441050	0.060	0.220	14	49	115	2.70	100.76	42.80
10440220	1.027	0.121	17	39	106	-99	98.11	61.27
10440240	0.101	0.500	7	216	1232	-99	98.39	4.66
10440260	0.986	0.121	11	39	102	-99	97.21	60.75
10440280	0.120	0.148	57	312	648	-99	97.92	4.84
10440300	1.041	0.121	12	41	101	-99	97.22	60.81
10440320	0.223	0.155	2	1223	583	-99	97.27	3.66
10440340	0.979	0.121	13	41	103	-99	97.28	60.83
10440360	0.229	0.233	30	137	399	-99	99.19	6.68
10440380	1.012	0.116	10	41	107	-99	94.76	59.13
10440400	0.104	0.163	94	123	502	-99	87.04	4.81
10440420	1.057	0.121	9	47	107	-99	96.67	60.39
10440440	0.176	0.017	362	14	6	-99	99.41	7.75
10440460	1.041	0.121	10	44	107	-99	97.59	60.96
10440480	1.046	0.122	9	60	103	-99	97.78	61.13
10440500	0.172	0.119	84	90	174	*GOI	99.96	7.77
10440520	1.064	0.123	9	43	109	-99	98.43	61.47
10440540	0.036	0.040	4	206	818	-99	97.18	1.31
10440560	1.047	0.123	9	42	109	-99	98.97	61.85
10440580	0.034	0.129	6	309	1913	-99	96.95	1.96
10440600	1.044	0.123	10	40	107	-99	99.52	62.21
10440620	0.174	0.268	257	157	130	-99	98.72	8.30
10440640	1.053	0.125	9	40	108	-99	99.13	61.88
10440660	0.098	0.257	4	174	1451	-99	99.05	3.45

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Appendix E: Major-element ICP-OES-FUS standards and duplicate data

Lab Number	MnO	P2O5	Cr	Zr	Ba	LOI	Total	Fe
Method	OES-FUS	OES-FUS	OES-FUS	OES-FUS	OES-FUS	Grav		Calculated
Detection Limit	0.001	0.001	1	1	1	0.01		na
Unit	%	%	ppm	ppm	ppm	%	%	%
10440680	1.044	0.122	9	41	106	-99	97.86	61.13
10440700	0.102	0.496	9	213	1253	-99	97.72	4.97
10440720	0.223	0.153	1	1200	581	-99	98.13	3.72
10440760	0.221	0.226	30	130	394	-99	95.74	6.72
10440780	1.040	0.123	9	40	107	-99	96.62	60.40
10440800	0.103	0.164	92	119	493	-99	87.24	5.09
10440820	1.028	0.121	8	39	102	-99	94.45	58.86
10440840	0.182	0.018	369	20	9	-99	101.62	8.10
10440860	0.995	0.120	9	30	97	-99	95.90	59.79
10440880	0.172	0.121	80	92	182	-99	98.26	7.47
10440900	1.016	0.122	10	31	108	-99	97.14	60.54
10440920	0.036	0.041	2	223	856	-99	97.95	1.33
10440940	1.024	0.123	9	43	99	-99	97.75	60.59
10440960	0.100	0.163	93	122	496	-99	86.33	4.92
10441040	1.031	0.122	9	31	107	-99	97.96	60.82
10441060	0.035	0.130	7	339	1905	-99	98.17	1.91
10441080	1.028	0.124	9	42	101	-99	95.34	59.21

*GOI - gain on ignition

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Appendix F: Trace-element ICP-OES standards and duplicate data

Lab Number	Field Numbers	Year	As	Be	Cu	Li	Mn	Ni	Pb	Rb	Sc	Ti	Zn
Method			OES	OES	OES	OES	OES	OES	OES	OES	OES	OES	OES
Detection Limit			2	0.1	1	0.1	1	1	1	1	0.1	1	1
Unit			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
10440629	Joy-12-96 27-30	2012	-99	2.3	5	2.9	3229	41	2	4	0.6	-1	32
10440630	Joy-12-96 27-30 (Dup)	2012	-99	2.2	5	3.0	2956	38	3	3	0.6	-1	29
10440642	Joy-12-96 60-63	2012	-99	1.9	6	2.7	9249	42	4	5	0.7	164	34
10440650	Joy-12-96 60-63 (Dup)	2012	-99	1.9	6	2.8	8526	42	4	7	0.8	166	34
10440664	Joy-12-71A 15-18	2012	-99	0.8	4	1.1	2130	33	1	4	0.4	17	24
10440670	Joy-12-71A 15-18 (Dup)	2012	-99	0.8	4	1.1	2184	33	2	2	0.4	17	24
10440689	Joy-12-71A 84-87	2012	-99	6.4	25	2.6	1221	63	19	2	1.4	336	62
10440690	Joy-12-71A 84-87 (Dup)	2012	-99	6.4	25	2.6	1233	63	19	4	1.4	337	63
10440701	JC12-080	2012	-99	0.9	46	34.8	1540	60	-1	18	29.9	11150	103
10440710	JC12-080 (Dup)	2012	-99	1.0	48	34.7	1587	61	-1	19	30.2	10864	106
10440889	13JC085A01	2013	-99	1.1	9	0.3	12404	32	5	2	0.6	284	22
10440890	13JC085A01 (Dup)	2013	-99	1.1	8	0.3	12414	32	5	2	0.6	283	22
10440909	13JC_C99	2013	-99	0.3	4	0.5	285	36	2	-1	-0.1	27	23
10440910	13JC_C99 (Dup)	2013	-99	0.3	5	0.5	288	36	2	2	-0.1	28	23
10441032	14JC-C066	2014	24	1.9	7	0.7	398	43	1	9	1.6	878	31
10441050	14JC-C066 (Dup)	2014	24	1.9	7	0.7	404	42	2	9	1.6	872	31
10440220	WGB-1	2012	-99	0.3	83	41.1	927	59	2	20	43.2	5185	35
10440240	SY-4	2012	-99	2.6	5	35.9	746	9	4	49	0.9	1702	90
10440260	WGB-1	2012	-99	0.4	83	43.2	916	60	3	24	42.9	5119	34
10440280	SY-4	2012	-99	2.6	5	36.8	757	9	4	49	1.0	1695	92
10440300	WGB-1	2012	-99	0.4	83	42.8	946	62	2	23	42.5	5212	36
10440320	SY-4	2012	-99	2.7	5	37.6	787	10	4	52	1.0	1793	96
10440340	WGB-1	2012	-99	0.4	87	46.9	979	64	2	24	45.7	5511	36
10440360	SY-4	2012	-99	2.5	6	35.3	759	9	2	46	1.0	1630	90
10440380	WGB-1	2012	-99	0.4	87	41.5	909	59	-1	18	41.6	4740	34
10440400	SY-4	2012	-99	2.6	6	36.5	765	10	2	46	1.0	1630	90
10440420	WGB-1	2012	-99	0.4	86	42.0	932	61	-1	19	41.0	5055	35
10440440	SY-4	2012	-99	2.6	7	35.8	769	10	2	45	1.0	1681	92
10440460	WGB-1	2012	-99	0.4	87	44.2	948	62	-1	20	41.9	5223	37
10440480	SY-4	2012	-99	2.6	6	36.5	777	10	3	46	1.0	1700	93
10440500	SY-4	2012	-99	2.6	6	38.1	752	10	4	50	1.0	1752	95
10440520	WGB-1	2012	-99	0.4	93	46.9	938	62	7	24	45.2	5376	37
10440540	SY-4	2012	-99	2.7	6	38.1	743	10	3	50	0.9	1708	94
10440560	WGB-1	2012	-99	0.4	88	45.7	902	61	3	19	43.9	5015	36
10440580	SY-4	2012	-99	3.0	6	42.1	805	11	3	54	1.0	1857	100
10440600	WGB-1	2012	-99	0.4	89	46.3	921	61	3	21	44.9	4998	36
10440620	SY-4	2012	-99	2.7	5	36.6	768	9	3	45	1.0	1720	92
10440640	WGB-1	2012	-99	0.4	92	44.5	944	61	6	18	43.9	5151	36
10440660	SY-4	2012	-99	2.7	5	36.3	763	9	5	49	1.0	1728	92

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Appendix F: Trace-element ICP-OES standards and duplicate data

Lab Number Method Detection Limit Unit	Field Numbers	Year	As	Be	Cu	Li	Mn	Ni	Pb	Rb	Sc	Ti	Zn
			OES	OES	OES	OES	OES	OES	OES	OES	OES	OES	OES
			2	0.1	1	0.1	1	1	1	1	0.1	1	1
			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
10440680	WGB-1	2012	-99	0.5	92	43.3	923	60	7	21	43.3	5119	35
10440700	SY-4	2012	-99	2.8	6	38.0	768	9	4	47	1.0	1763	86
10440720	SY-4	2013	-99	2.6	5	35.0	780	12	1	51	0.8	1604	86
10440740	WGB-1	2013	-99	0.3	86	43.6	912	57	3	19	41.7	4734	33
10440760	SY-4	2013	-99	2.6	5	36.1	783	12	-1	55	0.9	1617	87
10440780	WGB-1	2013	-99	0.3	91	43.5	952	58	-1	22	43.0	4812	35
10440800	SY-4	2013	-99	2.5	6	34.4	756	11	-1	52	0.9	1632	86
10440820	WGB-1	2013	-99	0.3	80	40.4	888	54	6	18	39.5	4814	33
10440840	SY-4	2013	-99	2.6	6	36.2	758	12	3	55	1.0	1707	91
10440860	WGB-1	2013	-99	0.3	82	40.6	897	54	1	19	39.9	4903	33
10440880	SY-4	2013	-99	2.5	5	34.9	760	12	-1	52	0.8	1670	88
10440900	WGB-1	2013	-99	0.3	89	43.5	949	61	4	21	43.1	5148	35
10440920	SY-4	2013	-99	2.5	6	35.1	766	12	3	52	0.9	1705	90
10440940	WGB-1	2013	-99	0.3	90	43.3	943	61	3	21	42.6	5117	35
10440960	SY-4	2013	-99	2.6	7	35.9	780	12	3	53	0.9	1704	91
10441040	SY-4	2014	3	2.6	5	40.0	839	13	-1	60	1.0	1718	89
10441060	WGB-1	2014	2	0.3	97	44.3	996	60	2	24	45.0	5081	36
10441080	SY-4	2014	2	2.6	5	38.5	848	11	-1	56	0.8	1770	96

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Appendix G: Trace-element ICP-MS-FUS standards and duplicate data

Lab Number Method Detection Limit Unit	Field Numbers	Year	V	Co	Ga	Ge	As	Sr	Y	Nb	Mo	Cd	In	Sn
			MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS
			5	1	1	1	5	1	1	1	2	0.2	0.2	1
			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
10440629	Joy-12-96 27-30	2012	46	5	2	23	40	12	7	-1	3	-99	-0.2	-1
10440630	Joy-12-96 27-30 (Dup)	2012	48	5	2	25	38	13	8	-1	3	-99	-0.2	-1
10440642	Joy-12-96 60-63	2012	129	17	3	21	31	29	13	3	9	-99	-0.2	-1
10440650	Joy-12-96 60-63 (Dup)	2012	127	16	3	21	29	29	13	3	9	-99	-0.2	-1
10440664	Joy-12-71A 15-18	2012	52	4	3	21	19	23	10	8	5	-99	-0.2	-1
10440670	Joy-12-71A 15-18 (Dup)	2012	50	3	3	19	21	22	10	9	5	-99	-0.2	1
10440689	Joy-12-71A 84-87	2012	142	12	5	10	26	104	38	4	5	-99	-0.2	-1
10440690	Joy-12-71A 84-87 (Dup)	2012	141	10	6	11	28	105	39	3	5	-99	-0.2	-1
10440701	JC12-080	2012	276	51	21	4	-5	350	19	20	-2	-99	-0.2	1
10440710	JC12-080 (Dup)	2012	34	6	2	19	49	6	7	3	2	-99	-0.2	-1
10440889	13JC085A01	2013	72	20	2	12	9	2	11	4	2	-0.2	-0.2	-1
10440890	13JC085A01 (Dup)	2013	74	20	2	11	9	2	11	4	2	0.4	-0.2	-1
10440909	13JC_C99	2013	72	15	-1	16	5	2	-1	4	2	0.5	-0.2	-1
10440910	13JC_C99 (Dup)	2013	70	17	-1	15	5	2	-1	5	3	0.7	-0.2	-1
10441032	14JC-C066	2014	276	-99	6	20	-99	375	36	6	3	-0.2	-99	-1
10441050	14JC-C066 (Dup)	2014	260	-99	6	21	-99	373	34	8	2	0.2	-99	-1
10440220	SCH-1	2012	44	20	4	24	52	28	15	6	4	-99	-0.2	-1
10440240	AGV-1	2012	117	15	21	3	-5	637	17	13	2	-99	-0.2	4
10440260	SCH-1	2012	40	18	3	27	56	27	14	6	4	-99	-0.2	-1
10440280	SCH-1	2012	43	20	3	30	56	28	13	5	3	-99	-0.2	-1
10440300	SCH-1	2012	42	17	3	22	50	26	13	6	4	-99	-0.2	-1
10440320	STM-1	2012	-5	-1	43	6	5	735	44	268	6	-99	-0.2	8
10440340	SCH-1	2012	43	17	3	19	51	25	13	6	3	-99	-0.2	-1
10440360	DR-N	2012	232	41	23	3	-5	415	25	8	2	-99	-0.2	2
10440380	SCH-1	2012	40	19	3	26	62	27	13	5	3	-99	-0.2	29
10440400	MAG-1	2012	152	24	26	5	6	151	28	16	-2	-99	-0.2	4
10440420	SCH-1	2012	38	24	4	30	68	27	14	6	3	-99	-0.2	-1
10440440	BIR-1	2012	405	66	19	2	-5	136	18	2	-2	-99	-0.2	-1
10440460	SCH-1	2012	40	17	3	23	44	25	13	5	3	-99	-0.2	-1
10440480	SCH-1	2012	39	17	3	24	43	25	13	6	3	-99	-0.2	-1
10440500	W-2	2012	269	43	17	4	-5	195	20	9	-2	-99	-0.2	2
10440520	SCH-1	2012	38	17	3	22	38	25	12	6	4	-99	-0.2	-1
10440540	RGM-1	2012	11	2	18	2	-5	102	21	9	3	-99	-0.2	4
10440560	SCH-1	2012	40	17	3	24	42	25	13	5	3	-99	-0.2	-1
10440580	G-2	2012	36	5	27	4	-5	480	9	13	-2	-99	-0.2	2
10440600	SCH-1	2012	43	19	3	24	36	25	13	6	4	-99	-0.2	-1
10440620	BHVO-1	2012	326	46	22	5	-5	402	24	18	-2	-99	-0.2	2
10440640	SCH-1	2012	37	19	3	23	37	27	13	7	3	-99	-0.2	-1
10440660	QLO-1	2012	54	7	18	3	-5	334	22	11	4	-99	-0.2	3
10440680	SCH-1	2012	42	18	3	21	39	24	13	6	3	-99	-0.2	2
10440700	AGV-1	2012	129	16	22	4	5	665	17	16	4	-99	-0.2	4

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Appendix G: Trace-element ICP-MS-FUS standards and duplicate data

Lab Number Method Detection Limit Unit	Field Numbers	Year	V	Co	Ga	Ge	As	Sr	Y	Nb	Mo	Cd	In	Sn
			MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS
			5	1	1	1	5	1	1	1	2	0.2	0.2	1
			ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
10440720	STM-1	2013	6	-1	37	4	-5	684	41	246	7	0.8	-0.2	8
10440740	SCH-1	2013	41	20	3	21	42	27	13	6	4	-0.2	-0.2	-1
10440760	DR-N	2013	206	36	18	3	-5	366	23	12	-2	-0.2	-0.2	2
10440780	SCH-1	2013	48	19	3	25	48	26	14	6	4	0.3	-0.2	-1
10440800	MAG-1	2013	146	24	22	2	-5	141	24	14	2	-0.2	-0.2	3
10440820	SCH-1	2013	36	17	3	22	46	24	12	6	3	-0.2	-0.2	1
10440840	BIR-1	2013	353	57	16	2	-5	114	15	1	-2	-0.2	-0.2	1
10440860	SCH-1	2013	41	18	3	25	55	27	13	7	3	0.5	-0.2	1
10440880	W-2	2013	268	44	17	3	-5	194	20	9	-2	-0.2	-0.2	2
10440900	SCH-1	2013	42	17	3	23	49	25	13	7	3	0.3	-0.2	-1
10440920	RGM-1	2013	15	2	16	2	-5	105	21	11	4	-0.2	-0.2	5
10440940	SCH-1	2013	47	18	2	22	40	27	12	5	4	0.5	-0.2	2
10440960	MAG-1	2013	163	23	23	3	14	140	25	14	-2	-0.2	-0.2	4
10441040	SCH-1	2014	45	-99	4	18	-99	26	14	5	2	0.2	-99	1
10441060	G-2	2014	42	-99	32	4	-99	484	9	12	-2	-0.2	-99	1
10441080	SCH-1	2014	35	-99	4	16	-99	25	12	6	2	-0.2	-99	-1

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Appendix G: Trace-element ICP-MS-FUS standards and duplicate data

Lab Number	Cs	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf
Method	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS
Detection Limit	0.5	0.5	0.5	0.1	0.2	0.1	0.05	0.1	0.1	0.1	0.1	0.1	0.05	0.1	0.05	0.2
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
10440629	-0.5	5.4	16.6	2.0	9.5	2.2	0.61	1.8	0.2	1.4	0.3	0.7	0.10	0.5	0.05	-0.2
10440630	-0.5	5.7	17.9	2.0	9.8	2.1	0.61	2.1	0.3	1.6	0.3	0.8	0.09	0.6	0.10	-0.2
10440642	-0.5	7.2	19.3	2.4	11.5	2.3	0.77	2.7	0.3	2.4	0.5	1.3	0.19	1.2	0.14	0.2
10440650	-0.5	7.2	19.2	2.3	11.5	2.5	0.88	2.5	0.4	2.2	0.5	1.5	0.19	1.1	0.14	0.4
10440664	-0.5	8.6	17.3	2.0	8.2	2.0	0.60	1.9	0.3	1.8	0.4	1.0	0.12	0.6	0.09	1.0
10440670	-0.5	10.2	20.0	2.2	9.8	2.2	0.59	2.1	0.3	2.0	0.4	1.1	0.11	0.6	0.10	1.7
10440689	-0.5	10.0	22.8	2.6	11.9	3.0	0.84	3.4	0.6	4.1	1.0	3.4	0.47	2.9	0.37	0.3
10440690	-0.5	9.9	23.0	2.6	11.9	2.8	0.91	3.5	0.6	4.2	1.0	3.5	0.48	3.1	0.41	0.3
10440701	-0.5	18.9	41.9	5.4	23.5	4.8	1.54	4.7	0.7	3.7	0.7	2.0	0.22	1.8	0.19	2.8
10440710	-0.5	3.4	6.0	0.7	2.8	0.7	0.21	1.0	0.1	1.0	0.2	0.6	0.09	0.6	0.07	-0.2
10440889	0.6	6.6	13.5	1.7	7.2	1.6	0.53	1.7	0.3	1.6	0.4	1.3	0.14	0.9	0.11	0.3
10440890	0.7	6.3	13.8	1.7	7.1	1.4	0.58	1.8	0.3	1.8	0.4	1.3	0.18	0.9	0.13	0.3
10440909	-0.5	0.7	1.3	0.1	0.6	0.1	-0.05	0.1	-0.1	0.2	-0.1	-0.1	-0.05	-0.1	-0.05	-0.2
10440910	-0.5	0.8	1.3	0.1	0.6	0.1	-0.05	0.1	-0.1	0.1	-0.1	0.1	-0.05	-0.1	-0.05	0.3
10441032	1.1	35.6	64.6	7.9	31.9	6.2	1.90	6.7	0.9	5.6	1.1	3.3	0.46	3.0	0.46	0.6
10441050	1.3	39.0	62.4	7.3	29.8	5.9	1.87	6.3	1.0	5.2	1.2	3.1	0.51	3.0	0.46	0.7
10440220	-0.5	14.4	39.5	3.0	11.5	2.0	0.56	2.4	0.3	2.1	0.4	1.3	0.20	1.1	0.13	0.4
10440240	0.8	36.3	65.0	7.8	30.4	5.4	1.63	4.9	0.6	3.6	0.6	1.7	0.24	1.7	0.22	4.8
10440260	-0.5	14.9	38.3	3.0	10.9	2.1	0.51	2.0	0.3	2.1	0.4	1.3	0.16	1.0	0.12	0.4
10440280	-0.5	16.3	40.3	3.1	11.7	2.1	0.58	2.3	0.3	1.9	0.4	1.2	0.17	1.1	0.12	0.5
10440300	-0.5	13.9	37.1	2.7	10.9	2.0	0.51	1.8	0.3	1.9	0.4	1.3	0.16	1.1	0.14	0.5
10440320	1.4	155.0	271.3	25.9	83.3	12.6	3.59	10.8	1.5	8.3	1.5	4.6	0.66	4.4	0.63	28.1
10440340	-0.5	13.8	36.2	2.8	11.0	2.3	0.52	2.0	0.3	2.0	0.4	1.3	0.18	1.0	0.14	0.6
10440360	4.7	21.7	46.4	5.8	24.4	5.7	1.51	5.5	0.8	4.9	1.0	2.9	0.38	2.6	0.39	3.6
10440380	-0.5	15.3	40.4	3.1	11.5	2.2	0.55	2.3	0.3	2.1	0.4	1.3	0.16	1.1	0.11	0.5
10440400	4.7	44.2	90.5	10.6	40.5	7.8	1.60	7.2	0.9	5.5	1.0	3.0	0.41	2.7	0.40	3.7
10440420	-0.5	14.8	39.8	3.0	11.7	2.2	0.61	2.3	0.3	2.1	0.4	1.3	0.17	1.1	0.12	0.6
10440440	-0.5	-0.5	2.3	0.4	2.8	1.3	0.61	2.2	0.5	3.2	0.6	2.1	0.29	2.0	0.30	0.8
10440460	-0.5	13.6	37.6	2.8	11.3	2.1	0.51	2.2	0.3	1.9	0.4	1.3	0.17	1.0	0.13	0.5
10440480	-0.5	13.5	35.8	2.8	10.5	2.1	0.49	2.1	0.3	2.0	0.4	1.2	0.19	1.0	0.13	0.8
10440500	0.5	10.2	22.5	2.9	13.1	3.5	1.05	3.8	0.6	3.7	0.8	2.3	0.30	2.1	0.30	2.4
10440520	-0.5	13.5	35.6	2.7	10.5	1.8	0.51	2.3	0.3	1.9	0.4	1.2	0.18	1.0	0.13	0.6
10440540	7.0	22.0	45.4	5.0	19.0	3.9	0.60	3.7	0.6	3.6	0.7	2.3	0.35	2.5	0.36	5.6
10440560	-0.5	13.1	35.6	2.7	10.6	2.0	0.48	1.9	0.3	1.9	0.4	1.2	0.16	1.0	0.13	0.4
10440580	-0.5	88.5	160.7	16.2	52.9	7.5	1.48	4.5	0.5	2.2	0.3	1.0	0.10	0.8	0.09	8.0
10440600	-0.5	14.8	37.6	2.9	10.8	1.8	0.48	2.2	0.3	1.8	0.4	1.3	0.17	0.9	0.13	0.5
10440620	-0.5	15.1	37.0	5.3	23.8	5.9	2.06	6.4	0.9	5.5	1.0	2.5	0.33	2.2	0.26	4.1
10440640	-0.5	14.4	38.2	2.9	11.1	2.1	0.55	2.2	0.3	2.0	0.4	1.4	0.18	1.0	0.13	0.5
10440660	1.1	26.8	49.9	5.9	22.8	4.9	1.30	4.3	0.7	3.9	0.7	2.3	0.36	2.4	0.35	4.6
10440680	-0.5	13.4	36.4	2.8	10.3	2.0	0.53	2.1	0.3	1.8	0.4	1.2	0.16	1.0	0.14	0.4
10440700	0.8	40.1	69.7	8.4	33.0	5.6	1.61	5.2	0.6	3.5	0.7	1.9	0.24	1.7	0.25	5.0

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Appendix G: Trace-element ICP-MS-FUS standards and duplicate data

Lab Number	Cs	La	Ce	Pr	Nd	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf
Method	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS
Detection Limit	0.5	0.5	0.5	0.1	0.2	0.1	0.05	0.1	0.1	0.1	0.1	0.1	0.05	0.1	0.05	0.2
Unit	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
10440720	0.7	151.1	257.1	25.2	78.9	11.7	3.50	9.2	1.4	8.0	1.5	4.7	0.71	4.1	0.71	27.0
10440740	-0.5	14.5	38.4	3.0	11.5	2.1	0.54	1.9	0.3	2.0	0.4	1.4	0.19	1.2	0.14	0.6
10440760	2.7	20.9	42.7	5.3	20.6	4.5	1.36	4.7	0.7	4.4	0.9	2.4	0.33	2.3	0.35	3.2
10440780	-0.5	16.0	38.8	2.9	11.6	2.1	0.56	2.2	0.3	2.1	0.4	1.3	0.18	1.2	0.15	0.6
10440800	1.7	42.4	84.1	9.7	37.9	7.4	1.35	6.0	0.9	5.2	0.9	2.9	0.34	2.6	0.32	3.4
10440820	-0.5	13.6	35.8	2.7	10.3	1.8	0.51	2.0	0.3	1.8	0.4	1.2	0.17	0.9	0.12	0.5
10440840	-0.5	1.7	2.4	0.4	2.8	1.3	0.49	2.0	0.4	2.8	0.5	1.7	0.24	1.8	0.26	0.6
10440860	-0.5	14.1	37.7	3.0	11.9	1.9	0.59	2.0	0.3	1.9	0.4	1.2	0.16	1.1	0.14	0.6
10440880	-0.5	11.2	22.5	2.9	12.4	3.0	1.07	3.7	0.6	3.8	0.7	2.1	0.31	1.9	0.30	2.5
10440900	-0.5	13.7	36.7	2.7	10.5	1.9	0.53	1.9	0.3	2.0	0.4	1.2	0.17	1.0	0.13	0.6
10440920	4.1	24.1	45.3	5.3	19.2	3.9	0.66	3.7	0.6	3.6	0.7	2.3	0.31	2.5	0.38	6.1
10440940	-0.5	15.7	38.1	3.0	11.5	1.9	0.52	2.0	0.3	1.9	0.4	1.2	0.16	1.1	0.13	0.6
10440960	5.3	46.3	84.4	9.8	36.8	7.0	1.51	5.9	0.9	5.1	0.9	2.8	0.40	2.5	0.40	3.6
10441040	-0.5	15.5	38.5	2.8	11.0	2.1	0.54	1.9	0.3	2.1	0.4	1.3	0.18	1.1	0.13	0.6
10441060	1.3	91.8	165.6	16.6	53.9	6.8	1.34	3.6	0.5	2.2	0.3	0.9	0.11	0.7	0.10	8.4
10441080	-0.5	12.7	33.8	2.5	9.7	1.8	0.46	1.8	0.3	1.6	0.4	1.3	0.15	0.8	0.13	0.4

Appendix G: Trace-element ICP-MS-FUS standards and duplicate data

Lab Number	Ta	W	Tl	Bi	Th	U	Remarks
Method	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	
Detection Limit	0.5	1	0.1	0.4	0.1	0.1	
Unit	ppm	ppm	ppm	ppm	ppm	ppm	
10440629	-0.5	-1	-0.1	-0.4	-0.1	2.1	
10440630	-0.5	-1	-0.1	-0.4	0.1	2.2	
10440642	-0.5	-1	-0.1	-0.4	0.3	2.5	
10440650	-0.5	-1	-0.1	-0.4	0.4	2.5	
10440664	-0.5	3	-0.1	-0.4	0.3	1.5	
10440670	-0.5	2	-0.1	-0.4	0.2	1.5	
10440689	-0.5	2	-0.1	0.4	0.3	3.8	
10440690	-0.5	3	-0.1	-0.4	0.3	3.7	
10440701	1.3	-1	-0.1	-0.4	1.4	0.3	
10440710	-0.5	3	-0.1	0.7	0.1	0.3	
10440889	-0.5	-99	-0.1	-0.4	0.3	0.7	
10440890	-0.5	-99	-0.1	-0.4	0.4	0.8	
10440909	0.8	-99	-0.1	-0.4	0.1	0.4	
10440910	0.9	-99	-0.1	0.6	0.1	0.4	
10441032	-0.5	-99	-0.1	-0.4	0.6	3.4	
10441050	-0.5	-99	-0.1	-0.4	0.7	3.2	
10440220	-0.5	10	-0.1	0.5	0.7	1.2	
10440240	0.8	-1	-0.1	-0.4	6.0	1.8	
10440260	-0.5	3	0.6	-0.4	0.8	1.1	
10440280	-0.5	2	-0.1	-0.4	0.7	1.2	
10440300	-0.5	3	-0.1	-0.4	0.7	1.2	
10440320	19.6	4	-0.1	-0.4	31.3	9.1	
10440340	-0.5	2	-0.1	0.5	0.8	1.4	
10440360	0.9	149	-0.1	-0.4	4.7	1.5	
10440380	-0.5	2	-0.1	-0.4	0.7	1.1	
10440400	1.2	2	-0.1	-0.4	12.3	2.8	
10440420	-0.5	2	-0.1	-0.4	0.7	1.1	
10440440	-0.5	1	-0.1	-0.4	-0.1	-0.1	
10440460	-0.5	2	-0.1	-0.4	0.7	1.1	
10440480	-0.5	2	-0.1	-0.4	0.6	1.1	
10440500	0.8	2	-0.1	-0.4	2.1	0.5	
10440520	0.5	3	-0.1	-0.4	0.7	1.1	
10440540	1.2	2	-0.1	-0.4	13.5	5.4	
10440560	-0.5	2	-0.1	0.5	1.3	1.4	
10440580	1.1	-1	-0.1	-0.4	24.5	1.9	
10440600	-0.5	2	-0.1	-0.4	0.6	1.1	
10440620	1.3	-1	-0.1	-0.4	1.3	0.5	
10440640	-0.5	2	-0.1	-0.4	0.6	1.1	
10440660	1.2	3	-0.1	-0.4	4.7	1.8	
10440680	-0.5	2	-0.1	1.0	0.6	1.1	
10440700	1.2	2	-0.1	-0.4	6.0	1.9	

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Appendix G: Trace-element ICP-MS-FUS standards and duplicate data

Lab Number	Ta	W	Tl	Bi	Th	U	Remarks
Method	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	MS-FUS	
Detection Limit	0.5	1	0.1	0.4	0.1	0.1	
Unit	ppm	ppm	ppm	ppm	ppm	ppm	
10440720	18.7	-99	0.1	-0.4	28.7	8.2	
10440740	-0.5	-99	-0.1	-0.4	0.7	1.1	
10440760	1.0	-99	-0.1	-0.4	4.9	1.4	
10440780	-0.5	-99	-0.1	0.4	0.7	1.2	
10440800	1.2	-99	-0.1	-0.4	11.4	2.5	
10440820	-0.5	-99	-0.1	-0.4	0.7	1.1	
10440840	-0.5	-99	-0.1	-0.4	-0.1	-0.1	
10440860	-0.5	-99	-0.1	1.2	0.7	1.1	
10440880	0.5	-99	-0.1	-0.4	2.1	0.5	
10440900	-0.5	-99	-0.1	0.9	0.7	1.1	
10440920	1.3	-99	-0.1	-0.4	14.1	5.4	
10440940	-0.5	-99	-0.1	2.6	0.7	1.1	
10440960	1.5	-99	-0.1	-0.4	11.4	2.7	
10441040	-0.5	-99	-0.1	-0.4	0.7	1.1	
10441060	0.9	-99	-0.1	-0.4	24.0	1.7	
10441080	-0.5	-99	-0.1	-0.4	0.7	1.0	