

APPENDIX C
STREAM SEDIMENT DATA, 2016

TABLE 7

BULK ASBESTOS CONTENT (%) IN THE SEDIMENT SAMPLES, CLINTON CREEK, SEPTEMBER 2016

Sample ID	Asbestos: Actinolite	Asbestos By Point Count	Asbestos: Chrysotile	Asbestos: Tremolite	Other Fibres: Cellulose	Other Fibres: MMVF	Mica
MDL	0.10	0.10	0.1	0.10	1	1.0	1
E-1A			1-5		1-5		Trace <1
E-1B			1-5		1-5		Trace <1
E-1C			1-5		Trace <1		Trace <1
E-2A			1-5		Trace <1		Trace <1
E-2B			1-5				Trace <1
E-2C			1-5				Trace <1
E-3A			1-5		1-5		1-5
E-3B			1-5				Trace <1
E-3C			1-5		1-5		1-5
E-4A			1-5				Trace <1
E-4B			1-5				1-5
E-4C			1-5				Trace <1
E-8A	0.10		0.10		1-5	Trace <1	1-5
E-8B	0.10				1-5	Trace <1	1-5
E-8C	0.10			0.10	1-5	Trace <1	1-5
PORCUPINE CR-A			1-5				Trace <1
PORCUPINE CR-B			1-5				Trace <1
PORCUPINE CR-C			1-5		1-5		Trace <1
R-1A		<0.10			Trace <1	Trace <1	1-5
R-1B		<0.10				Trace <1	1-5
R-1C		<0.10			Trace <1	Trace <1	1-5
R-2A	0.10		0.30		1-5	Trace <1	1-5
R-2B	0.10		0.20		Trace <1	Trace <1	1-5
R-2C		<0.10			Trace <1	Trace <1	1-5
R-3A			0.20		1-5	Trace <1	1-5
R-3B		<.1			Trace <1	Trace <1	1-5
R-3C			0.10		1-5		1-5
R-4A	0.20						1-5
R-4B		<0.10				Trace <1	1-5
R-4C	0.10				Trace <1		1-5
R-6A			0.10		Trace <1		Trace <1
R-6B		<0.10			Trace <1	Trace <1	1-5
R-6C		<0.10			Trace <1	Trace <1	1-5
E-6A			0.50		Trace <1		1-5
E-6B			0.80				1-5
E-6C			1-5				5-10

TABLE 9		SEVERAL YEARS OF CONCENTRATIONS OF METALS (ug/g) IN STREAM SEDIMENTS, CLINTON CREEK	
1978	1979	1980	1981
1982	1983	1984	1985
1986	1987	1988	1989
1990	1991	1992	1993
1994	1995	1996	1997
1998	1999	2000	2001
2002	2003	2004	2005
2006	2007	2008	2009
2010	2011	2012	2013
2014	2015	2016	2017
2018	2019	2020	2021
2022	2023	2024	2025
2026	2027	2028	2029
2030	2031	2032	2033
2034	2035	2036	2037
2038	2039	2040	2041
2042	2043	2044	2045
2046	2047	2048	2049
2050	2051	2052	2053
2054	2055	2056	2057
2058	2059	2060	2061
2062	2063	2064	2065
2066	2067	2068	2069
2070	2071	2072	2073
2074	2075	2076	2077
2078	2079	2080	2081
2082	2083	2084	2085
2086	2087	2088	2089
2090	2091	2092	2093
2094	2095	2096	2097
2098	2099	2100	2101
2102	2103	2104	2105
2106	2107	2108	2109
2110	2111	2112	2113
2114	2115	2116	2117
2118	2119	2120	2121
2122	2123	2124	2125
2126	2127	2128	2129
2130	2131	2132	2133
2134	2135	2136	2137
2138	2139	2140	2141
2142	2143	2144	2145
2146	2147	2148	2149
2150	2151	2152	2153
2154	2155	2156	2157
2158	2159	2160	2161
2162	2163	2164	2165
2166	2167	2168	2169
2170	2171	2172	2173
2174	2175	2176	2177
2178	2179	2180	2181
2182	2183	2184	2185
2186	2187	2188	2189
2190	2191	2192	2193
2194	2195	2196	2197
2198	2199	2200	2201
2202	2203	2204	2205
2206	2207	2208	2209
2210	2211	2212	2213
2214	2215	2216	2217
2218	2219	2220	2221
2222	2223	2224	2225
2226	2227	2228	2229
2230	2231	2232	2233
2234	2235	2236	2237
2238	2239	2240	2241
2242	2243	2244	2245
2246	2247	2248	2249
2250	2251	2252	2253
2254	2255	2256	2257
2258	2259	2260	2261
2262	2263	2264	2265
2266	2267	2268	2269
2270	2271	2272	2273
2274	2275	2276	2277
2278	2279	2280	2281
2282	2283	2284	2285
2286	2287	2288	2289
2290	2291	2292	2293
2294	2295	2296	2297
2298	2299	2300	2301
2302	2303	2304	2305
2306	2307	2308	2309
2310	2311	2312	2313
2314	2315	2316	2317
2318	2319	2320	

Site Type	Parameter	Arsenic					Cadmium					Chromium					Nickel				
	Year	1998	2009	2010	2011	2016	1998	2009	2010	2011	2016	1998	2009	2010	2011	2016	1998	2009	2010	2011	2016
Reference	R1 - Clinton Cr u/s Hudgeon Lake				4.5	11.9				0.54	0.86				28.7	36				29	42
	R2 - Easter Cr u/s Hudgeon Lake				5.2	12.2				0.5	0.32				39.3	32				50.8	54
	R3 - Wolverine Cr u/s tailings	11		5.3	3.4	5.3	0.6		0.96	0.3	0.33	62		40.1	24.7	38	70		50.6	29.1	44
	R4 - Eagle Cr u/s culverts			6.2	8.2	16.8			0.4	0.61	0.70			24	33.5	42			27.8	42.3	68
	R6 - Forty Mile River u/s Clinton Creek				1.5	9.0				0.1	0.34				20.8	35				16	30
Exposed	E1 - Clinton Cr d/s gabions and u/s Porcupine Cr				23.7	18.3				1.2	1.13				458	266				844	436
	E2 - Clinton Cr d/s Porcupine u/s Wolverine			25.4	22.9	15.8			2	1.1	0.87			283	337	257			715	675	402
	E3 - Wolverine Cr u/s culverts	11	8.6	5.5	4.2	7.8	<0.1	0.15	<0.05	0.55	0.49	1670	1180	1160	72.5	45	1860	1660	2200	109	58
	E4 - Clinton Cr d/s Wolverine u/s Eagle		11.6	13.2	3.6	9.1		0.19	0.7	0.64	0.54		1170	222	34.8	106			472	60.6	155
	E8 - Forty Mile River d/s Clinton Creek			3.9	2.1	12.2			0.08	0.1	0.16			21.7	23	13				17.9	16.9
	ISQG PEL	5.9 17					0.6 3.5					37.3 90.0									

Note: ISQG = Interim freshwater Sediment Quality Guidelines, in **bold** where exceeded.
PEL = Probable Effects Level (>50% of adverse effects occur above this level), highlighted and in **bold** where exceeded.

TABLE 10

FRACTIONAL COMPONENTS OF THE STREAM SEDIMENTS, 2016

Classification	Gravel	Course Sand		Medium Sand	Fine Sand		Silt		Clay
Particle Size	(>2mm)	(2.00mm - 1.00mm)	(1.00mm - 0.50mm)	(0.50mm - 0.25mm)	(0.25mm - 0.125mm)	(0.125mm - 0.063mm)	(0.063mm - 0.0312mm)	(0.0312mm - 0.004mm)	(<4um)
E-1A	3.18	1.12	0.94	13.65	13.76	26.03	21.31	10.10	9.91
E-1B	1.46	2.76	10.90	39.44	9.16	12.00	9.03	5.86	9.39
E-1C	3.87	3.84	10.39	36.56	10.84	15.27	6.91	4.89	7.43
E-2A	11.34	31.97	22.76	21.85	2.61	2.53	1.78	2.03	3.14
E-2B	3.27	3.90	5.18	30.93	11.09	24.74	8.91	5.14	6.84
E-2C	5.67	6.66	9.01	30.06	11.98	18.46	6.91	5.09	6.16
E-3A	0.02	0.25	0.40	12.40	8.62	29.93	27.97	12.04	8.38
E-3B	0.02	0.08	0.97	16.01	10.93	35.97	21.88	8.15	5.99
E-3C	0.01	0.57	2.91	21.82	10.18	29.88	18.05	9.57	7.00
E-4A	6.85	0.75	4.08	50.11	8.93	9.16	10.14	4.87	5.11
E-4B	2.97	0.30	1.33	14.41	9.94	34.48	21.24	9.70	5.63
E-4C	0.19	1.67	5.99	26.49	8.86	27.67	14.65	8.41	6.08
E-6A	0.41	0.60	2.77	17.50	6.64	24.64	29.53	12.19	5.72
E-6B	0.02	0.17	1.31	26.04	12.68	27.67	18.40	8.37	5.34
E-6C	0.02	0.16	5.62	53.06	11.50	16.40	5.41	4.60	3.23
E-8A	75.39	3.95	4.12	12.54	1.00	0.18	1.26	0.68	0.87
E-8B	72.15	7.22	4.09	12.21	1.17	0.61	1.01	0.84	0.69
E-8C	74.09	5.99	4.05	11.44	1.13	0.89	1.03	0.77	0.61
Porcupine Cr-A	23.29	14.15	16.80	24.37	2.41	2.17	7.30	6.15	3.35
Porcupine Cr-B	12.66	31.92	21.91	7.40	1.04	1.71	10.48	9.97	2.90
Porcupine Cr-C	46.29	20.99	15.64	9.13	0.68	1.32	1.49	2.89	1.56
R1-A	0.7	1.3	1.9	5.9	9.5	9.4	33.3	34.2	3.8
R1-B	<1.0	<1.0	<1.0	<1.0	1.1	7.2	40.2	45.5	5.8
R1-C	<1.0	<1.0	<1.0	<1.0	<1.0	3.7	40.9	48.7	6.3
R-2A	0.75	1.52	5.98	16.40	3.73	29.69	25.94	11.02	4.98
R-2B	5.73	13.88	27.14	23.00	2.74	8.45	10.51	4.74	3.81
R-2C	<1.0	<1.0	<1.0	<1.0	<1.0	13	39.6	41	5.5
R3-A	1.30	1.03	3.10	3.49	0.79	24.60	29.98	26.25	9.46
R3-B	8.1	<1.0	<1.0	<1.0	<1.0	<1.0	34.3	47.3	9.4
R-3C	0.82	0.08	0.30	0.54	0.11	22.47	29.28	35.93	10.47
R-4A	0.19	2.87	11.68	26.77	8.20	22.43	14.02	7.45	6.39
R4-B	0.3	2.3	6	10.2	9.5	15.8	26.4	25.7	3.8
R-4C	0.56	8.13	15.40	17.45	5.01	26.05	14.90	8.07	4.44
R-6A	30.77	0.54	0.80	3.54	2.12	15.18	16.64	23.43	6.97
R6-B	6.2	<1.0	<1.0	<1.0	3.8	8.6	30.6	41.3	9.2
R6-C	<1.0	<1.0	<1.0	<1.0	2.3	8	35.6	45.7	8.2

FIGURE 3 Proportion of Particle Sizes at each site, 2016

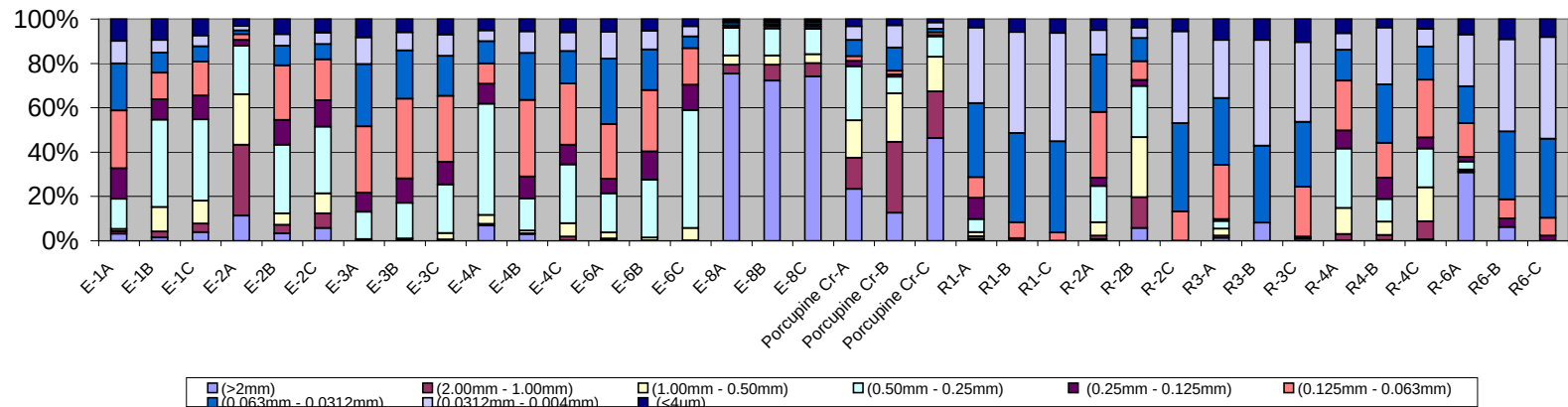


TABLE 11 LOSS ON IGNITION ANALYSIS			
Sample Number	Water Content (%)	Ash Content (%)	Organic Matter (%)
E-1A	35.8	97.5	2.5
E-1B	22.0	97.6	2.4
E-1C	22.1	98.4	1.6
E-2A	27.5	98.5	1.5
E-2B	32.0	97.6	2.4
E-2C	29.8	97.8	2.2
E-3A	30.3	96.7	3.3
E-3B	27.0	97.2	2.8
E-3C	26.7	97.3	2.7
E-4A	25.8	97.8	2.2
E-4B	30.7	96.4	3.6
E-4C	29.7	96.3	3.7
E-6A	28.3	96.7	3.3
E-6B	27.5	97.5	2.5
E-6C	28.9	98.1	1.9
E-8A	10.0	99.4	0.6
E-8B	5.6	99.6	0.4
E-8C	6.5	99.5	0.5
PORCUPINE CR-A	19.1	97.9	2.1
PORCUPINE CR-B	24.4	97.5	2.5
PORCUPINE CR-C	18.1	98.3	1.7
R-1A	NR	NR	6
R-1B	NR	NR	9
R-1C	NR	NR	14
R-2A	44.7	94.3	5.7
R-2B	23.1	97.6	2.4
R-2C	NR	NR	6
R-3A	95.5	83.6	16.4
R-3B	NR	NR	6
R-3C	49.9	91.2	8.8
R-4A	23.6	97.8	2.2
R-4B	NR	NR	2
R-4C	20.2	97.9	2.1
R-6A	46.1	92.8	7.2
R-6B	NR	NR	11
R-6C	NR	NR	10
NR = not reported			



LABERGE ENVIRONMENTAL
ATTN: Bonnie Burns
PO Box 21072
Whitehorse YT Y1A 6P7

Date Received: 16-SEP-16
Report Date: 16-NOV-16 08:58 (MT)
Version: FINAL REV. 3

Client Phone: 867-668-6838

Certificate of Analysis

Lab Work Order #: L1829672
Project P.O. #: NOT SUBMITTED
Job Reference: CLINTON CREEK
C of C Numbers: 14-470676, 14-470677, 14-470939
Legal Site Desc:

Comments: ADDITIONAL 21-OCT-16 13:36

Taryn Williams, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 9936-67 Avenue, Edmonton, AB T6E 0P5 Canada | Phone: +1 780 413 5227 | Fax: +1 780 437 2311
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829672-1 SOIL 06-SEP-16 E-1A	L1829672-2 SOIL 06-SEP-16 E-1B	L1829672-3 SOIL 06-SEP-16 E-1C	L1829672-4 SOIL 06-SEP-16 E-2A	L1829672-5 SOIL 06-SEP-16 E-2B
Grouping	Analyte					
BULK						
Asbestos/Quartz/ Other Fibres	Asbestos: Actinolite (%)					
	Asbestos By Point Count (%)					
	Other Fibres: Cellulose (%)	1-5	1-5	Trace <1	Trace <1	
	Asbestos: Chrysotile (%)	1-5	1-5	1-5	1-5	1-5
	Other Fibres: MMVF (%)					
	Mica (%)	Trace <1	Trace <1	Trace <1	Trace <1	Trace <1
	Asbestos: Tremolite (%)					

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829672-6 SOIL 06-SEP-16 E-2C	L1829672-7 SOIL 06-SEP-16 E-3A	L1829672-8 SOIL 06-SEP-16 E-3B	L1829672-9 SOIL 06-SEP-16 E-3C	L1829672-10 SOIL 06-SEP-16 E-4A
Grouping	Analyte					
BULK						
Asbestos/Quartz/ Other Fibres	Asbestos: Actinolite (%)					
	Asbestos By Point Count (%)					
	Other Fibres: Cellulose (%)		1-5		1-5	
	Asbestos: Chrysotile (%)	1-5	1-5	1-5	1-5	1-5
	Other Fibres: MMVF (%)					
	Mica (%)	Trace <1	1-5	Trace <1	1-5	Trace <1
	Asbestos: Tremolite (%)					

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829672-11 SOIL 06-SEP-16 E-4B	L1829672-12 SOIL 06-SEP-16 E-4C	L1829672-13 SOIL 06-SEP-16 E-8A	L1829672-14 SOIL 06-SEP-16 E-8B	L1829672-15 SOIL 06-SEP-16 E-8C
Grouping	Analyte					
BULK						
Asbestos/Quartz/ Other Fibres	Asbestos: Actinolite (%)			0.10	0.10	0.10
	Asbestos By Point Count (%)					
	Other Fibres: Cellulose (%)			1-5	1-5	1-5
	Asbestos: Chrysotile (%)	1-5	1-5	0.10		
	Other Fibres: MMVF (%)			Trace <1	Trace <1	Trace <1
	Mica (%)	1-5	Trace <1	1-5	1-5	1-5
	Asbestos: Tremolite (%)					0.10

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829672-16 SOIL 06-SEP-16 PORCUPINE CR-A	L1829672-17 SOIL 06-SEP-16 PORCUPINE CR-B	L1829672-18 SOIL 06-SEP-16 PORCUPINE CR-C	L1829672-19 SOIL 06-SEP-16 R-1A	L1829672-20 SOIL 06-SEP-16 R-1B
Grouping	Analyte					
BULK						
Asbestos/Quartz/ Other Fibres	Asbestos: Actinolite (%)					
	Asbestos By Point Count (%)				<0.10	<0.10
	Other Fibres: Cellulose (%)			1-5	Trace <1	
	Asbestos: Chrysotile (%)	1-5	1-5	1-5		
	Other Fibres: MMVF (%)				Trace <1	Trace <1
	Mica (%)	Trace <1	Trace <1	Trace <1	1-5	1-5
	Asbestos: Tremolite (%)					

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829672-21 SOIL 06-SEP-16 R-1C	L1829672-22 SOIL 06-SEP-16 R-2A	L1829672-23 SOIL 06-SEP-16 R-2B	L1829672-24 SOIL 06-SEP-16 R-2C	L1829672-25 SOIL 06-SEP-16 R-3A
Grouping	Analyte					
BULK						
Asbestos/Quartz/ Other Fibres	Asbestos: Actinolite (%)		0.10	0.10		
	Asbestos By Point Count (%)	<0.10			<0.10	
	Other Fibres: Cellulose (%)	Trace <1	1-5	Trace <1	Trace <1	1-5
	Asbestos: Chrysotile (%)		0.30	0.20		0.20
	Other Fibres: MMVF (%)	Trace <1	Trace <1	Trace <1	Trace <1	Trace <1
	Mica (%)	1-5	1-5	1-5	1-5	1-5
	Asbestos: Tremolite (%)					

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829672-26 SOIL 06-SEP-16 R-3B	L1829672-27 SOIL 06-SEP-16 R-3C	L1829672-28 SOIL 06-SEP-16 R-4A	L1829672-29 SOIL 06-SEP-16 R-4B	L1829672-30 SOIL 06-SEP-16 R-4C
Grouping	Analyte					
BULK						
Asbestos/Quartz/ Other Fibres	Asbestos: Actinolite (%)			0.20		0.10
	Asbestos By Point Count (%)	<.1			<0.10	
	Other Fibres: Cellulose (%)	Trace <1	1-5			Trace <1
	Asbestos: Chrysotile (%)		0.10			
	Other Fibres: MMVF (%)	Trace <1			Trace <1	
	Mica (%)	1-5	1-5	1-5	1-5	1-5
	Asbestos: Tremolite (%)					

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829672-31 SOIL 06-SEP-16 R-6A	L1829672-32 SOIL 06-SEP-16 R-6B	L1829672-33 SOIL 06-SEP-16 R-6C	L1829672-34 SOIL 06-SEP-16 E-6A	L1829672-35 SOIL 06-SEP-16 E-6B
Grouping	Analyte					
BULK						
Asbestos/Quartz/ Other Fibres	Asbestos: Actinolite (%)					
	Asbestos By Point Count (%)		<0.10	<0.10		
	Other Fibres: Cellulose (%)	Trace <1	Trace <1	Trace <1	Trace <1	
	Asbestos: Chrysotile (%)	0.10			0.50	0.80
	Other Fibres: MMVF (%)		Trace <1	Trace <1		
	Mica (%)	Trace <1	1-5	1-5	1-5	1-5
	Asbestos: Tremolite (%)					

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829672-36 SOIL 06-SEP-16 E-6C				
Grouping	Analyte					
BULK						
Asbestos/Quartz/ Other Fibres	Asbestos: Actinolite (%)					
	Asbestos By Point Count (%)					
	Other Fibres: Cellulose (%)					
	Asbestos: Chrysotile (%)	1-5				
	Other Fibres: MMVF (%)					
	Mica (%)	5-10				
	Asbestos: Tremolite (%)					

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829672-19 SOIL 06-SEP-16 R-1A	L1829672-20 SOIL 06-SEP-16 R-1B	L1829672-21 SOIL 06-SEP-16 R-1C	L1829672-24 SOIL 06-SEP-16 R-2C	L1829672-26 SOIL 06-SEP-16 R-3B
Grouping	Analyte					
SOIL						
Physical Tests	Loss On Ignition @ 420 C (%)	6	9	14	6	6
Particle Size	% Gravel (>2mm) (%)	<1.0	<1.0	<1.0	<1.0	8.1
	% Sand (2.00mm - 1.00mm) (%)	1.3	<1.0	<1.0	<1.0	<1.0
	% Sand (1.00mm - 0.50mm) (%)	1.9	<1.0	<1.0	<1.0	<1.0
	% Sand (0.50mm - 0.25mm) (%)	5.9	<1.0	<1.0	<1.0	<1.0
	% Sand (0.25mm - 0.125mm) (%)	9.5	1.1	<1.0	<1.0	<1.0
	% Sand (0.125mm - 0.063mm) (%)	9.4	7.2	3.7	13.0	<1.0
	% Silt (0.063mm - 0.0312mm) (%)	33.3	40.2	40.9	39.6	34.3
	% Silt (0.0312mm - 0.004mm) (%)	34.2	45.5	48.7	41.0	47.3
	% Clay (<4um) (%)	3.8	5.8	6.3	5.5	9.4
	Texture	Silt loam	Silt	Silt	Silt loam / Silt	Silt
Metals	Aluminum (Al) (mg/kg)	10300	11000	11100	11800	12700
	Antimony (Sb) (mg/kg)	1.48	1.33	1.35	1.42	0.80
	Arsenic (As) (mg/kg)	13.2	10.9	11.6	11.2	7.95
	Barium (Ba) (mg/kg)	172	228	269	265	419
	Beryllium (Be) (mg/kg)	0.32	0.36	0.39	0.36	0.38
	Bismuth (Bi) (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B) (mg/kg)	<5.0	<5.0	<5.0	<5.0	<5.0
	Cadmium (Cd) (mg/kg)	0.691	0.849	1.04	0.359	0.437
	Calcium (Ca) (mg/kg)	6070	8500	11100	6520	7100
	Chromium (Cr) (mg/kg)	38.9	33.4	35.5	34.5	28.5
	Cobalt (Co) (mg/kg)	13.2	11.3	12.1	10.7	9.48
	Copper (Cu) (mg/kg)	31.3	33.0	38.9	20.9	26.0
	Iron (Fe) (mg/kg)	28300	24200	25300	22500	22500
	Lead (Pb) (mg/kg)	13.1	14.2	14.4	8.66	10.1
	Lithium (Li) (mg/kg)	9.4	9.0	9.3	10.4	11.3
	Magnesium (Mg) (mg/kg)	7540	6200	6590	5660	5550
	Manganese (Mn) (mg/kg)	646	498	606	434	412
	Mercury (Hg) (mg/kg)	0.150	0.191	0.221	0.0351	0.0748
	Molybdenum (Mo) (mg/kg)	4.96	3.78	3.85	0.99	1.54
	Nickel (Ni) (mg/kg)	46.2	37.6	41.1	38.5	29.9
	Phosphorus (P) (mg/kg)	787	732	767	740	660
	Potassium (K) (mg/kg)	700	780	810	550	870
	Selenium (Se) (mg/kg)	1.78	1.90	2.30	0.55	0.87
	Silver (Ag) (mg/kg)	0.23	0.35	0.45	0.11	0.17
	Sodium (Na) (mg/kg)	75	141	131	182	216

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829672-29 SOIL 06-SEP-16 R-4B	L1829672-32 SOIL 06-SEP-16 R-6B	L1829672-33 SOIL 06-SEP-16 R-6C		
Grouping	Analyte					
SOIL						
Physical Tests	Loss On Ignition @ 420 C (%)	2	11	10		
Particle Size	% Gravel (>2mm) (%)	<1.0	6.2	<1.0		
	% Sand (2.00mm - 1.00mm) (%)	2.3	<1.0	<1.0		
	% Sand (1.00mm - 0.50mm) (%)	6.0	<1.0	<1.0		
	% Sand (0.50mm - 0.25mm) (%)	10.2	<1.0	<1.0		
	% Sand (0.25mm - 0.125mm) (%)	9.5	3.8	2.3		
	% Sand (0.125mm - 0.063mm) (%)	15.8	8.6	8.0		
	% Silt (0.063mm - 0.0312mm) (%)	26.4	30.6	35.6		
	% Silt (0.0312mm - 0.004mm) (%)	25.7	41.3	45.7		
	% Clay (<4um) (%)	3.8	9.2	8.2		
	Texture	Silt loam / Sandy loam	Silt loam	Silt		
Metals	Aluminum (Al) (mg/kg)	9290	16400	18100		
	Antimony (Sb) (mg/kg)	1.84	0.68	0.69		
	Arsenic (As) (mg/kg)	18.5	9.80	10.5		
	Barium (Ba) (mg/kg)	246	272	280		
	Beryllium (Be) (mg/kg)	0.27	0.49	0.47		
	Bismuth (Bi) (mg/kg)	<0.20	<0.20	<0.20		
	Boron (B) (mg/kg)	<5.0	<5.0	<5.0		
	Cadmium (Cd) (mg/kg)	0.784	0.396	0.406		
	Calcium (Ca) (mg/kg)	7680	8560	9230		
	Chromium (Cr) (mg/kg)	48.5	37.9	40.1		
	Cobalt (Co) (mg/kg)	13.2	13.3	14.3		
	Copper (Cu) (mg/kg)	27.3	28.8	30.5		
	Iron (Fe) (mg/kg)	27100	28200	29800		
	Lead (Pb) (mg/kg)	10.7	9.85	10.1		
	Lithium (Li) (mg/kg)	10.2	15.2	14.3		
	Magnesium (Mg) (mg/kg)	8230	7940	8420		
	Manganese (Mn) (mg/kg)	639	540	626		
	Mercury (Hg) (mg/kg)	0.0631	0.0615	0.0581		
	Molybdenum (Mo) (mg/kg)	3.17	0.80	0.85		
	Nickel (Ni) (mg/kg)	77.3	33.6	35.8		
	Phosphorus (P) (mg/kg)	992	644	686		
	Potassium (K) (mg/kg)	440	1320	1440		
	Selenium (Se) (mg/kg)	1.48	0.48	0.49		
	Silver (Ag) (mg/kg)	0.19	0.14	0.14		
	Sodium (Na) (mg/kg)	102	232	257		

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829672-19 SOIL 06-SEP-16 R-1A	L1829672-20 SOIL 06-SEP-16 R-1B	L1829672-21 SOIL 06-SEP-16 R-1C	L1829672-24 SOIL 06-SEP-16 R-2C	L1829672-26 SOIL 06-SEP-16 R-3B
Grouping	Analyte					
SOIL						
Metals	Strontium (Sr) (mg/kg)	41.6	53.6	63.9	41.8	47.8
	Thallium (Tl) (mg/kg)	0.102	0.136	0.136	0.075	0.109
	Tin (Sn) (mg/kg)	<2.0	<2.0	<2.0	<2.0	<2.0
	Titanium (Ti) (mg/kg)	266	338	286	419	467
	Uranium (U) (mg/kg)	1.18	1.30	1.47	1.06	1.53
	Vanadium (V) (mg/kg)	34.8	37.1	37.8	42.0	42.7
	Zinc (Zn) (mg/kg)	117	98.5	99.9	67.9	84.2
	Zirconium (Zr) (mg/kg)	3.0	2.7	3.3	1.7	2.6

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829672-29 SOIL 06-SEP-16 R-4B	L1829672-32 SOIL 06-SEP-16 R-6B	L1829672-33 SOIL 06-SEP-16 R-6C		
Grouping	Analyte					
SOIL						
Metals	Strontium (Sr) (mg/kg)	47.6	54.3	54.7		
	Thallium (Tl) (mg/kg)	0.073	0.121	0.126		
	Tin (Sn) (mg/kg)	<2.0	<2.0	<2.0		
	Titanium (Ti) (mg/kg)	311	786	874		
	Uranium (U) (mg/kg)	0.771	1.50	1.54		
	Vanadium (V) (mg/kg)	34.0	54.6	59.3		
	Zinc (Zn) (mg/kg)	102	93.2	99.8		
	Zirconium (Zr) (mg/kg)	2.7	2.5	2.6		

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829672-1 SOIL 06-SEP-16 E-1A	L1829672-2 SOIL 06-SEP-16 E-1B	L1829672-3 SOIL 06-SEP-16 E-1C	L1829672-4 SOIL 06-SEP-16 E-2A	L1829672-5 SOIL 06-SEP-16 E-2B
Grouping	Analyte					
WASTE						
Metals	Aluminum (Al) (mg/kg ww)	4980	5200	4570	3580	5160
	Antimony (Sb) (mg/kg ww)	4.84	5.69	4.79	3.22	4.08
	Arsenic (As) (mg/kg ww)	17.3	20.9	16.8	14.3	15.7
	Barium (Ba) (mg/kg ww)	369	223	241	74.2	165
	Beryllium (Be) (mg/kg ww)	0.30	0.37	0.31	0.24	0.30
	Bismuth (Bi) (mg/kg ww)	<0.20	0.21	<0.20	<0.20	<0.20
	Boron (B) (mg/kg ww)	16.3	14.8	19.9	16.6	17.3
	Cadmium (Cd) (mg/kg ww)	1.01	1.36	1.01	0.752	0.849
	Calcium (Ca) (mg/kg ww)	16800	22200	17500	14100	13400
	Chromium (Cr) (mg/kg ww)	264	266	269	258	248
	Cobalt (Co) (mg/kg ww)	29.4	31.3	28.2	25.4	24.1
	Copper (Cu) (mg/kg ww)	28.1	35.4	30.6	21.1	27.9
	Iron (Fe) (mg/kg ww)	30200	36100	32900	28100	26600
	Lead (Pb) (mg/kg ww)	11.2	13.6	11.4	9.68	10.0
	Lithium (Li) (mg/kg ww)	6.0	7.1	6.1	4.5	7.3
	Magnesium (Mg) (mg/kg ww)	37100	31900	36200	35400	33600
	Manganese (Mn) (mg/kg ww)	682	950	503	655	351
	Mercury (Hg) (mg/kg ww)	0.273	0.251	0.262	0.105	0.169
	Molybdenum (Mo) (mg/kg ww)	4.65	7.19	5.92	3.93	4.95
	Nickel (Ni) (mg/kg ww)	448	452	408	425	362
	Phosphorus (P) (mg/kg ww)	818	1040	715	491	597
	Potassium (K) (mg/kg ww)	520	530	480	270	510
	Selenium (Se) (mg/kg ww)	2.82	3.99	3.20	2.24	2.41
	Silver (Ag) (mg/kg ww)	0.25	0.34	0.26	0.18	0.23
	Sodium (Na) (mg/kg ww)	65	51	<50	<50	53
	Strontium (Sr) (mg/kg ww)	86.9	107	86.1	67.3	71.9
	Thallium (Tl) (mg/kg ww)	0.184	0.203	0.162	0.079	0.132
	Tin (Sn) (mg/kg ww)	<2.0	<2.0	<2.0	<2.0	<2.0
	Titanium (Ti) (mg/kg ww)	55.3	48.2	35.4	29.8	61.4
	Uranium (U) (mg/kg ww)	1.44	1.72	1.34	1.17	1.32
	Vanadium (V) (mg/kg ww)	21.1	22.5	19.7	16.3	18.9
	Zinc (Zn) (mg/kg ww)	83.4	112	92.3	82.0	80.4
Zirconium (Zr) (mg/kg ww)	5.0	5.4	6.9	4.2	7.4	

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L1829672-6 SOIL 06-SEP-16 E-2C	L1829672-7 SOIL 06-SEP-16 E-3A	L1829672-8 SOIL 06-SEP-16 E-3B	L1829672-9 SOIL 06-SEP-16 E-3C	L1829672-10 SOIL 06-SEP-16 E-4A
Grouping	Analyte						
WASTE							
Metals	Aluminum (Al) (mg/kg ww)	5470	7570	7650	7590	6180	
	Antimony (Sb) (mg/kg ww)	4.34	1.18	1.23	1.30	2.15	
	Arsenic (As) (mg/kg ww)	17.4	7.81	7.38	8.26	10.8	
	Barium (Ba) (mg/kg ww)	190	184	185	215	217	
	Beryllium (Be) (mg/kg ww)	0.34	0.23	0.23	0.25	0.23	
	Bismuth (Bi) (mg/kg ww)	<0.20	<0.20	<0.20	<0.20	<0.20	
	Boron (B) (mg/kg ww)	18.1	<5.0	5.2	5.3	10.1	
	Cadmium (Cd) (mg/kg ww)	1.02	0.501	0.473	0.485	0.525	
	Calcium (Ca) (mg/kg ww)	17000	3540	3350	3640	7650	
	Chromium (Cr) (mg/kg ww)	264	28.5	54.6	52.4	171	
	Cobalt (Co) (mg/kg ww)	27.0	8.12	9.32	10.2	21.7	
	Copper (Cu) (mg/kg ww)	32.5	23.0	21.3	23.8	20.7	
	Iron (Fe) (mg/kg ww)	30600	18400	18300	20700	26600	
	Lead (Pb) (mg/kg ww)	12.0	9.99	9.22	9.93	7.77	
	Lithium (Li) (mg/kg ww)	7.9	6.2	6.5	7.4	6.9	
	Magnesium (Mg) (mg/kg ww)	36900	5050	7720	7000	20200	
	Manganese (Mn) (mg/kg ww)	547	298	272	316	527	
	Mercury (Hg) (mg/kg ww)	0.175	0.080	0.071	0.080	0.081	
	Molybdenum (Mo) (mg/kg ww)	6.02	4.42	4.87	4.98	3.65	
	Nickel (Ni) (mg/kg ww)	418	39.9	69.9	65.6	246	
	Phosphorus (P) (mg/kg ww)	769	621	578	658	557	
	Potassium (K) (mg/kg ww)	510	710	700	790	460	
	Selenium (Se) (mg/kg ww)	2.85	1.51	1.47	1.54	1.83	
	Silver (Ag) (mg/kg ww)	0.26	0.19	0.18	0.17	0.17	
	Sodium (Na) (mg/kg ww)	<50	96	99	88	61	
	Strontium (Sr) (mg/kg ww)	83.9	29.7	28.8	30.1	48.1	
	Thallium (Tl) (mg/kg ww)	0.154	0.074	0.073	0.074	0.072	
	Tin (Sn) (mg/kg ww)	<2.0	<2.0	<2.0	<2.0	<2.0	
	Titanium (Ti) (mg/kg ww)	49.0	203	248	257	185	
	Uranium (U) (mg/kg ww)	1.66	0.963	0.999	0.994	0.963	
	Vanadium (V) (mg/kg ww)	20.5	26.1	26.9	28.7	24.2	
	Zinc (Zn) (mg/kg ww)	91.5	85.5	80.8	87.3	82.3	
	Zirconium (Zr) (mg/kg ww)	7.3	4.0	4.3	5.2	4.1	

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829672-11 SOIL 06-SEP-16 E-4B	L1829672-12 SOIL 06-SEP-16 E-4C	L1829672-13 SOIL 06-SEP-16 E-8A	L1829672-14 SOIL 06-SEP-16 E-8B	L1829672-15 SOIL 06-SEP-16 E-8C
Grouping	Analyte					
WASTE						
Metals	Aluminum (Al) (mg/kg ww)	6380	5340	3880	5660	4340
	Antimony (Sb) (mg/kg ww)	1.11	1.42	0.29	0.49	0.25
	Arsenic (As) (mg/kg ww)	9.19	7.32	18.1	5.12	13.4
	Barium (Ba) (mg/kg ww)	172	153	54.4	88.4	90.6
	Beryllium (Be) (mg/kg ww)	0.25	0.20	0.12	0.15	0.14
	Bismuth (Bi) (mg/kg ww)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B) (mg/kg ww)	5.9	6.2	<5.0	<5.0	<5.0
	Cadmium (Cd) (mg/kg ww)	0.577	0.512	0.084	0.119	0.266
	Calcium (Ca) (mg/kg ww)	6080	5560	1870	2870	2130
	Chromium (Cr) (mg/kg ww)	73.2	75.2	10.5	16.9	10.7
	Cobalt (Co) (mg/kg ww)	11.5	10.1	4.12	6.15	6.82
	Copper (Cu) (mg/kg ww)	21.2	16.7	13.0	9.77	12.7
	Iron (Fe) (mg/kg ww)	18800	15200	8830	14600	14800
	Lead (Pb) (mg/kg ww)	8.00	6.15	2.55	3.62	6.22
	Lithium (Li) (mg/kg ww)	6.4	5.0	3.7	6.0	4.4
	Magnesium (Mg) (mg/kg ww)	11100	10800	2370	3600	2660
	Manganese (Mn) (mg/kg ww)	405	367	239	323	347
	Mercury (Hg) (mg/kg ww)	0.084	0.069	<0.050	<0.050	0.071
	Molybdenum (Mo) (mg/kg ww)	3.41	2.41	0.34	0.72	0.75
	Nickel (Ni) (mg/kg ww)	110	108	9.80	12.6	15.3
	Phosphorus (P) (mg/kg ww)	597	483	269	326	331
	Potassium (K) (mg/kg ww)	480	410	420	490	500
	Selenium (Se) (mg/kg ww)	1.64	1.38	<0.20	0.35	0.77
	Silver (Ag) (mg/kg ww)	0.19	0.15	<0.10	<0.10	<0.10
	Sodium (Na) (mg/kg ww)	80	72	90	87	77
	Strontium (Sr) (mg/kg ww)	39.7	37.2	12.9	21.6	13.3
	Thallium (Tl) (mg/kg ww)	0.076	0.060	<0.050	<0.050	<0.050
	Tin (Sn) (mg/kg ww)	<2.0	<2.0	<2.0	<2.0	<2.0
	Titanium (Ti) (mg/kg ww)	126	178	196	224	196
	Uranium (U) (mg/kg ww)	0.885	0.795	0.459	0.562	0.581
	Vanadium (V) (mg/kg ww)	23.2	20.1	15.6	20.3	16.9
	Zinc (Zn) (mg/kg ww)	74.0	57.5	27.8	37.2	75.4
	Zirconium (Zr) (mg/kg ww)	3.6	2.4	<1.0	1.0	<1.0

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829672-16 SOIL 06-SEP-16 PORCUPINE CR-A	L1829672-17 SOIL 06-SEP-16 PORCUPINE CR-B	L1829672-18 SOIL 06-SEP-16 PORCUPINE CR-C	L1829672-22 SOIL 06-SEP-16 R-2A	L1829672-23 SOIL 06-SEP-16 R-2B
Grouping	Analyte					
WASTE						
Metals	Aluminum (Al) (mg/kg wwt)	2590	4490	2460	6000	6260
	Antimony (Sb) (mg/kg wwt)	2.16	2.45	4.73	1.42	3.21
	Arsenic (As) (mg/kg wwt)	11.9	13.5	17.5	9.43	15.9
	Barium (Ba) (mg/kg wwt)	121	119	55.0	147	159
	Beryllium (Be) (mg/kg wwt)	0.15	0.24	0.19	0.20	0.25
	Bismuth (Bi) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B) (mg/kg wwt)	8.6	15.4	21.4	<5.0	<5.0
	Cadmium (Cd) (mg/kg wwt)	0.509	0.727	1.26	0.238	0.355
	Calcium (Ca) (mg/kg wwt)	8940	16800	31700	3180	2010
	Chromium (Cr) (mg/kg wwt)	150	250	279	22.1	40.0
	Cobalt (Co) (mg/kg wwt)	15.4	21.3	25.2	6.96	12.9
	Copper (Cu) (mg/kg wwt)	13.7	19.5	22.5	12.8	19.2
	Iron (Fe) (mg/kg wwt)	17200	24100	26500	13700	22300
	Lead (Pb) (mg/kg wwt)	4.61	6.46	6.39	5.61	9.69
	Lithium (Li) (mg/kg wwt)	3.4	6.0	4.0	5.5	7.6
	Magnesium (Mg) (mg/kg wwt)	19500	31400	38900	3470	6340
	Manganese (Mn) (mg/kg wwt)	238	362	404	380	761
	Mercury (Hg) (mg/kg wwt)	0.091	0.090	0.155	<0.050	<0.050
	Molybdenum (Mo) (mg/kg wwt)	2.07	2.47	4.50	0.89	2.16
	Nickel (Ni) (mg/kg wwt)	234	361	474	30.8	92.8
	Phosphorus (P) (mg/kg wwt)	333	499	516	384	473
	Potassium (K) (mg/kg wwt)	240	390	210	380	460
	Selenium (Se) (mg/kg wwt)	1.37	1.66	2.26	0.42	0.78
	Silver (Ag) (mg/kg wwt)	0.13	0.14	0.28	<0.10	<0.10
	Sodium (Na) (mg/kg wwt)	<50	98	<50	93	<50
	Strontium (Sr) (mg/kg wwt)	44.6	83.0	123	22.8	19.1
	Thallium (Tl) (mg/kg wwt)	0.077	0.093	0.114	<0.050	0.051
	Tin (Sn) (mg/kg wwt)	<2.0	<2.0	<2.0	<2.0	<2.0
	Titanium (Ti) (mg/kg wwt)	65.5	116	29.4	206	107
	Uranium (U) (mg/kg wwt)	0.567	0.914	1.17	0.591	0.732
	Vanadium (V) (mg/kg wwt)	12.0	20.9	13.2	22.6	21.8
	Zinc (Zn) (mg/kg wwt)	45.5	65.4	85.5	43.5	71.9
	Zirconium (Zr) (mg/kg wwt)	2.9	2.4	3.9	1.4	2.6

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829672-25 SOIL 06-SEP-16 R-3A	L1829672-27 SOIL 06-SEP-16 R-3C	L1829672-28 SOIL 06-SEP-16 R-4A	L1829672-30 SOIL 06-SEP-16 R-4C	L1829672-31 SOIL 06-SEP-16 R-6A
Grouping	Analyte					
WASTE						
Metals	Aluminum (Al) (mg/kg wwt)	4300	7360	6640	7380	10100
	Antimony (Sb) (mg/kg wwt)	0.94	0.47	1.55	1.72	0.44
	Arsenic (As) (mg/kg wwt)	3.15	4.71	14.3	17.5	6.57
	Barium (Ba) (mg/kg wwt)	125	243	169	175	153
	Beryllium (Be) (mg/kg wwt)	0.17	0.24	0.20	0.23	0.26
	Bismuth (Bi) (mg/kg wwt)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B) (mg/kg wwt)	6.3	<5.0	<5.0	<5.0	<5.0
	Cadmium (Cd) (mg/kg wwt)	0.293	0.270	0.595	0.717	0.222
	Calcium (Ca) (mg/kg wwt)	4970	4170	5370	5470	7370
	Chromium (Cr) (mg/kg wwt)	68.1	17.3	36.1	40.2	26.3
	Cobalt (Co) (mg/kg wwt)	6.96	5.72	9.86	10.9	7.76
	Copper (Cu) (mg/kg wwt)	13.4	15.7	21.2	23.1	16.1
	Iron (Fe) (mg/kg wwt)	9870	13800	19700	21900	17600
	Lead (Pb) (mg/kg wwt)	3.51	6.19	8.36	9.14	6.45
	Lithium (Li) (mg/kg wwt)	3.8	7.3	7.6	9.1	9.4
	Magnesium (Mg) (mg/kg wwt)	9960	3300	5700	6700	4870
	Manganese (Mn) (mg/kg wwt)	173	229	494	640	364
	Mercury (Hg) (mg/kg wwt)	0.051	0.075	0.063	0.054	<0.050
	Molybdenum (Mo) (mg/kg wwt)	0.51	0.91	2.68	2.60	0.52
	Nickel (Ni) (mg/kg wwt)	82.8	18.2	58.1	70.0	20.7
	Phosphorus (P) (mg/kg wwt)	290	459	768	905	479
	Potassium (K) (mg/kg wwt)	410	520	380	440	780
	Selenium (Se) (mg/kg wwt)	0.80	0.56	1.29	1.42	0.34
	Silver (Ag) (mg/kg wwt)	<0.10	0.12	0.19	0.16	0.12
	Sodium (Na) (mg/kg wwt)	70	127	64	79	154
	Strontium (Sr) (mg/kg wwt)	29.6	29.2	35.9	37.4	41.1
	Thallium (Tl) (mg/kg wwt)	<0.050	0.063	0.056	0.063	0.068
	Tin (Sn) (mg/kg wwt)	<2.0	<2.0	<2.0	<2.0	<2.0
	Titanium (Ti) (mg/kg wwt)	104	169	146	220	457
	Uranium (U) (mg/kg wwt)	2.55	0.914	0.591	0.794	0.696
	Vanadium (V) (mg/kg wwt)	13.9	24.8	24.8	27.4	34.0
	Zinc (Zn) (mg/kg wwt)	38.6	50.4	73.0	83.9	60.1
	Zirconium (Zr) (mg/kg wwt)	1.6	2.1	2.8	3.3	1.6

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L1829672-34 SOIL 06-SEP-16 E-6A	L1829672-35 SOIL 06-SEP-16 E-6B	L1829672-36 SOIL 06-SEP-16 E-6C		
Grouping	Analyte						
WASTE							
Metals	Aluminum (Al) (mg/kg wwt)	6020	5580	5530			
	Antimony (Sb) (mg/kg wwt)	0.99	1.10	1.55			
	Arsenic (As) (mg/kg wwt)	9.46	10.8	16.3			
	Barium (Ba) (mg/kg wwt)	130	124	161			
	Beryllium (Be) (mg/kg wwt)	0.18	0.18	0.19			
	Bismuth (Bi) (mg/kg wwt)	<0.20	<0.20	<0.20			
	Boron (B) (mg/kg wwt)	<5.0	<5.0	<5.0			
	Cadmium (Cd) (mg/kg wwt)	0.290	0.326	0.391			
	Calcium (Ca) (mg/kg wwt)	4680	3960	4140			
	Chromium (Cr) (mg/kg wwt)	36.8	42.3	72.7			
	Cobalt (Co) (mg/kg wwt)	8.70	8.85	13.4			
	Copper (Cu) (mg/kg wwt)	15.9	17.3	19.5			
	Iron (Fe) (mg/kg wwt)	15500	16200	20800			
	Lead (Pb) (mg/kg wwt)	7.92	7.87	9.07			
	Lithium (Li) (mg/kg wwt)	5.8	5.0	5.5			
	Magnesium (Mg) (mg/kg wwt)	6140	6860	11600			
	Manganese (Mn) (mg/kg wwt)	382	362	632			
	Mercury (Hg) (mg/kg wwt)	<0.050	<0.050	0.050			
	Molybdenum (Mo) (mg/kg wwt)	1.62	1.77	2.54			
	Nickel (Ni) (mg/kg wwt)	50.3	60.2	108			
	Phosphorus (P) (mg/kg wwt)	545	540	518			
	Potassium (K) (mg/kg wwt)	480	490	500			
	Selenium (Se) (mg/kg wwt)	0.71	0.78	1.02			
	Silver (Ag) (mg/kg wwt)	<0.10	0.11	0.11			
	Sodium (Na) (mg/kg wwt)	79	62	<50			
	Strontium (Sr) (mg/kg wwt)	28.2	25.5	27.9			
	Thallium (Tl) (mg/kg wwt)	0.054	0.055	0.057			
	Tin (Sn) (mg/kg wwt)	<2.0	<2.0	<2.0			
	Titanium (Ti) (mg/kg wwt)	207	158	121			
	Uranium (U) (mg/kg wwt)	0.604	0.676	0.836			
	Vanadium (V) (mg/kg wwt)	23.0	20.7	21.6			
	Zinc (Zn) (mg/kg wwt)	58.0	61.9	77.7			
	Zirconium (Zr) (mg/kg wwt)	2.2	2.1	3.5			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ASBESTOS-BULK-ED	Bulk	Bulk Asbestos Content	NIOSH 9002-Polarized Microscopy
Bulk samples are examined under a stereoscopic microscope. Individual fibers or fibre bundles are mounted in refractive index liquids and are observed under a polarized light microscope with a special dispersion staining objective. The dispersion staining colours are compared to reference samples of known asbestiforms.			
Note: For non-friable organically bound asbestos (eg. floor tile) Polarized Light microscopy is not a definitive technique when negative results are obtained. Transmission electron microscopy is recommended to confirm the asbestos in these materials.			
Asbestos results reported as <1% indicates that no asbestos fibers were observed.			
ASBESTOS-PTCT-ED	Bulk	Quantitation of asbestos by point count	EPA/600/R-93/116
Bulk samples are examined under a stereoscopic microscope. Individual fibers or fiber bundles are mounted in refractive index liquids and are observed under a polarized light microscope, with a special dispersion staining objective. The dispersion staining colors are compared to reference samples of known asbestiforms.			
Polarized microscopy is not a definitive technique for negative results for non-friable organically bound material (i.e.floor tiles). Transmission electron microscopy is recommended to confirm the asbestos in these materials.			
Asbestos results reported as <0.10% indicates that no asbestos fibers were observed.			
HG-200.2-CVAA-ED	Soil	Mercury in Soil by CVAAS	EPA 200.2/1631E (Mod)
Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS.			
HG-WET-200.2-CVAA-ED	Waste	Mercury (Hg) in waste	EPA 200.2/245.1
Waste samples are prepared for analysis by mixing to homogenize the as-received waste, then subsampling. The subsample is digested according to the EPA 200.2 method, using nitric and hydrochloric acids. Analysis is carried out by cold vapour atomic absorption. Results are reported on a wet basis (not corrected for any moisture content).			
LOI-420-SK	Soil	Loss on Ignition @ 420 C	CSSS (1978) METHOD 3.81
The dry-ash method involves the removal of organic matter by combustion at 420OC for 2 hours. Samples are dried prior to combustion.			
Reference: McKeague, J.A. Soil Sampling and Methods of Analysis. Can. Soc. Soil Sci.(1978) method 3.81			
MET-200.2-CCMS-ED	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)
Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.			
Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.			
MET-WET200.2-CCMS-ED	Waste	Metals in Waste by CRC ICPMS	EPA 200.2/6020A
This analysis is carried out using procedures from CSR Analytical Method: "Strong Acid Leachable Metals (SALM) in Soil", BC Ministry of Environment, 26 June 2009, and procedures adapted from EPA Method 200.2. The sample is manually homogenized, dried at 60 degrees Celsius, sieved through a 2 mm (10 mesh) sieve, and a representative subsample of the dry material is weighed. The sample is then digested at 95 degrees Celsius for 2 hours by block digester using concentrated nitric and hydrochloric acids. Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).			
Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. By design, elements bound in silicate structures are not normally dissolved by this procedure as they are not usually mobile in the environment.			
PSA-PIPET-DETAIL-SK	Soil	Particle size - Sieve and Pipette	SSIR-51 METHOD 3.2.1
Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.			
Reference:			
Burt, R. (2009). Soil Survey Field and Laboratory Methods Manual. Soil Survey Investigations Report No. 5. Method 3.2.1.2.2. United States Department of Agriculture Natural Resources Conservation Service.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA

Reference Information

ED

SK

ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA

Chain of Custody Numbers:

14-470676

14-470677

14-470939

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg ww - milligrams per kilogram based on wet weight of sample.

mg/kg lw - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

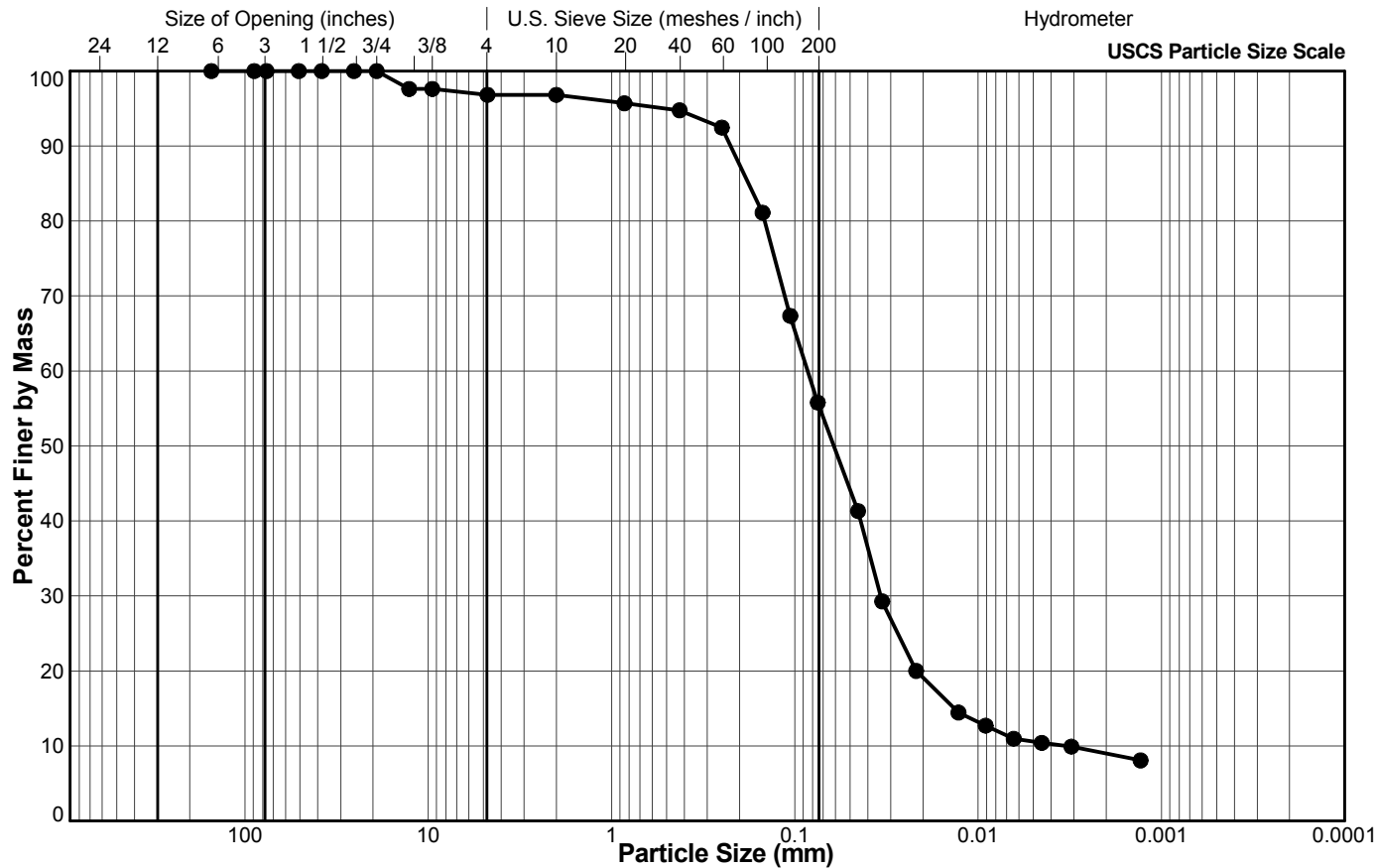
Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: E-1A
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	97.6
3/8"	9.5	97.6
#4 US MESH	4.75	96.8
#10 US MESH	2	96.8
#20 US MESH	0.85	95.7
#40 US MESH	0.425	94.8
#60 US MESH	0.25	92.5
#100 US MESH	0.15	81.1
#140 US MESH	0.106	67.4
#200 US MESH	0.075	55.8
	0.0452	41.3
	0.0334	29.3
	0.0218	20.0
	0.0128	14.4
	0.0091	12.7
	0.0064	11.0
	0.0045	10.4
	0.0031	9.9
	0.0013	8.1

BOULDER	COBBLE	GRAVEL		SAND			FINES (Silt, Clay)
		Coarse	Fine	Coarse	Medium	Fine	

LH/OA

11/8/2016

LH

11/15/2016

Tech

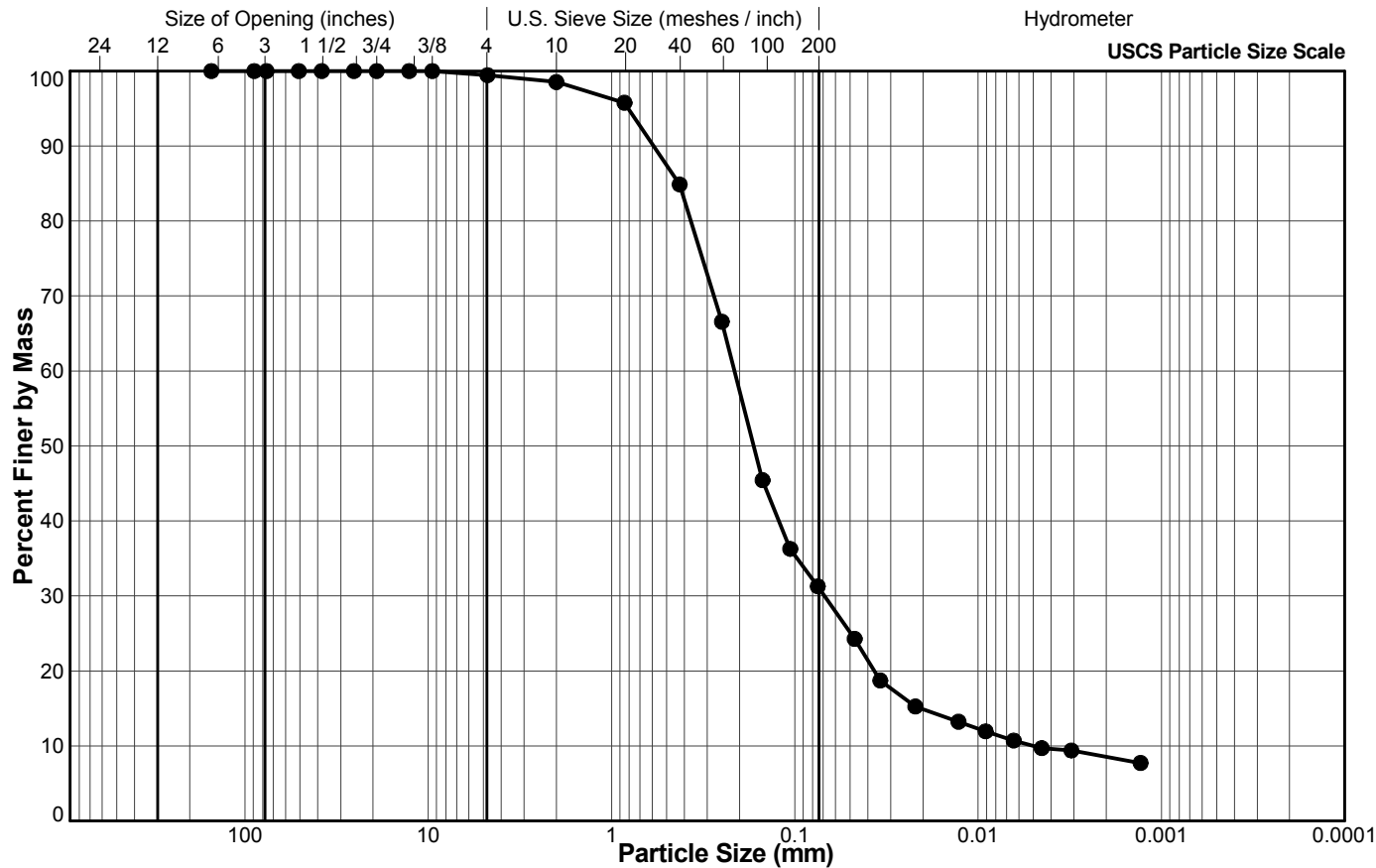
Date

Checked

Date

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: E-1B
Depth (m): N/A
Lab Schedule No.:



Legend

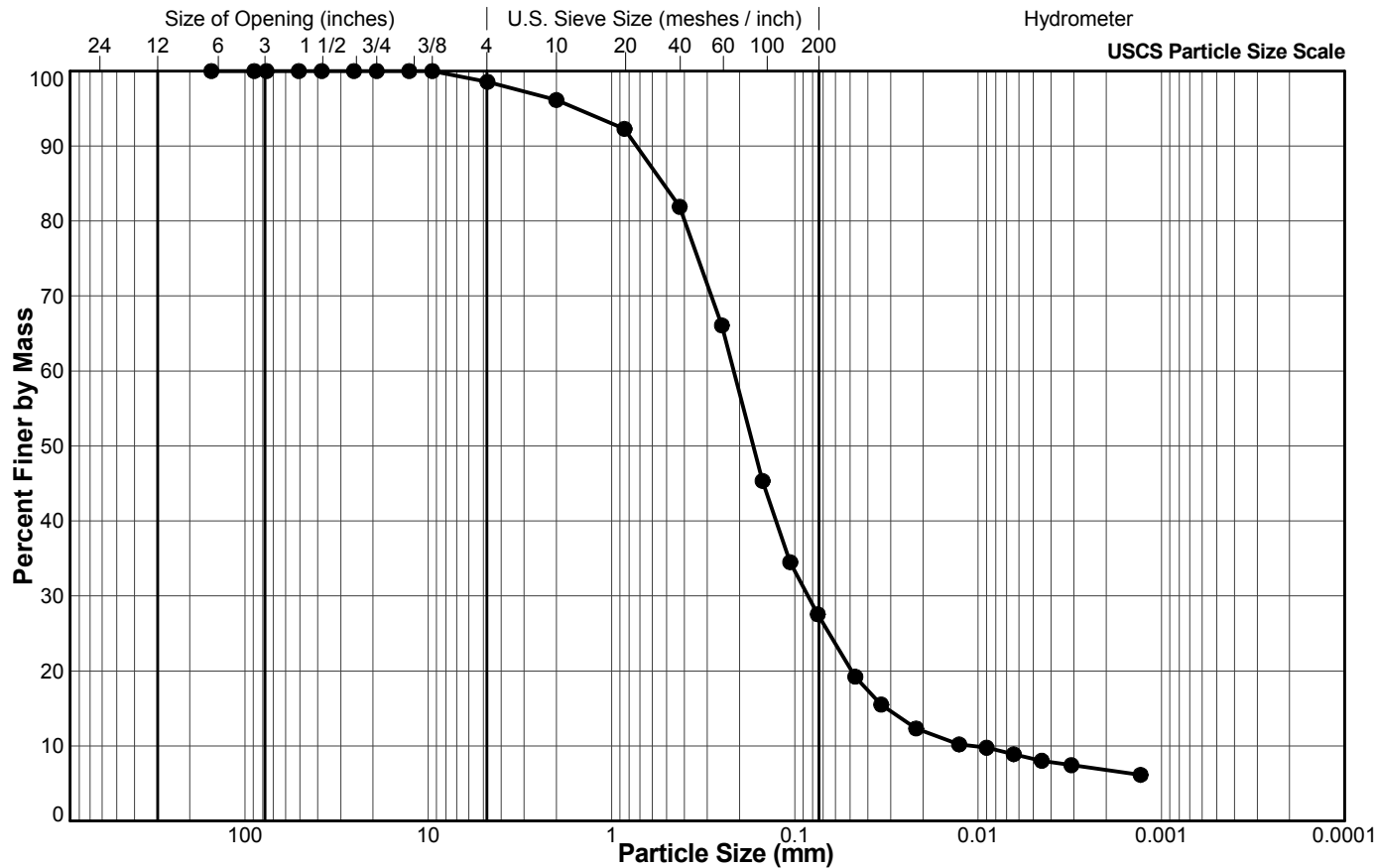
Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.5	100.0
#4 US MESH	4.75	99.4
#10 US MESH	2	98.5
#20 US MESH	0.85	95.8
#40 US MESH	0.425	84.9
#60 US MESH	0.25	66.6
#100 US MESH	0.15	45.4
#140 US MESH	0.106	36.3
#200 US MESH	0.075	31.3
	0.0472	24.3
	0.0342	18.7
	0.0220	15.3
	0.0128	13.2
	0.0091	11.9
	0.0064	10.7
	0.0045	9.7
	0.0031	9.4
	0.0013	7.7

BOULDER	COBBLE	GRAVEL		SAND			FINES (Silt, Clay)
		Coarse	Fine	Coarse	Medium	Fine	

LH/OA
11/8/2016
LH
11/15/2016
Tech
Date
Checked
Date

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: E-1C
Depth (m): N/A
Lab Schedule No.:


Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.5	100.0
#4 US MESH	4.75	98.6
#10 US MESH	2	96.1
#20 US MESH	0.85	92.3
#40 US MESH	0.425	81.9
#60 US MESH	0.25	66.1
#100 US MESH	0.15	45.3
#140 US MESH	0.106	34.5
#200 US MESH	0.075	27.6
	0.0468	19.2
	0.0338	15.5
	0.0218	12.3
	0.0127	10.2
	0.0090	9.8
	0.0064	8.9
	0.0045	8.0
	0.0031	7.4
	0.0013	6.1

BOULDER		COBBLE		GRAVEL		SAND			FINES (Silt, Clay)
				Coarse	Fine	Coarse	Medium	Fine	

LH/OA
11/8/2016
LH
11/15/2016

Tech

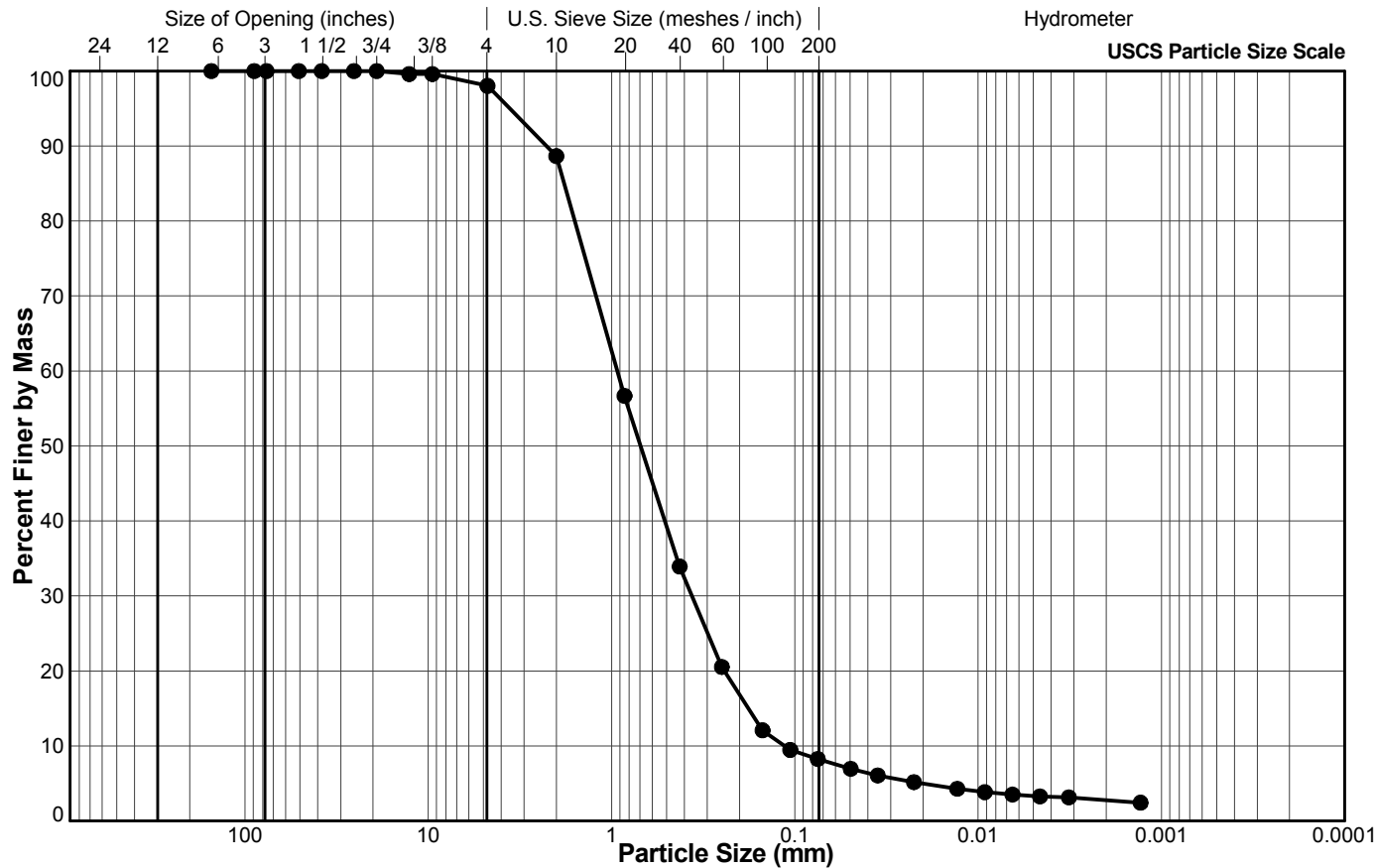
Date

Checked

Date

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: E-2A
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	99.6
3/8"	9.5	99.6
#4 US MESH	4.75	98.0
#10 US MESH	2	88.7
#20 US MESH	0.85	56.7
#40 US MESH	0.425	33.9
#60 US MESH	0.25	20.5
#100 US MESH	0.15	12.1
#140 US MESH	0.106	9.5
#200 US MESH	0.075	8.3
	0.0496	6.9
	0.0353	6.1
	0.0224	5.2
	0.0130	4.3
	0.0092	3.8
	0.0065	3.5
	0.0046	3.3
	0.0032	3.1
	0.0013	2.4

BOULDER		COBBLE		GRAVEL		SAND			FINES (Silt, Clay)
				Coarse	Fine	Coarse	Medium	Fine	

LH/OA
11/9/2016
LH
11/15/2016

Tech

Date

Checked

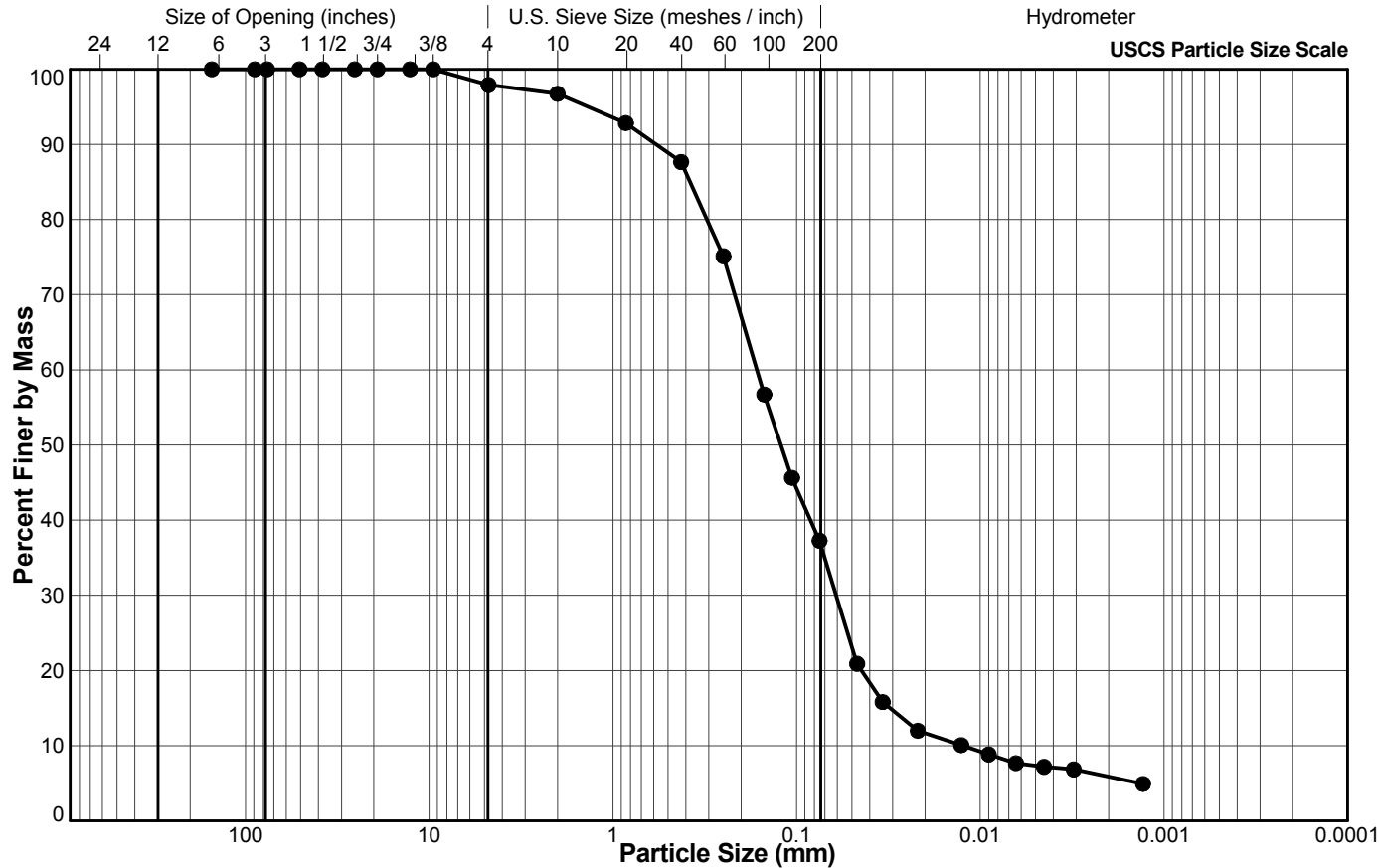
Date

SUMMARY OF PARTICLE SIZE DISTRIBUTION

ASTM D 422

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: E-2B
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.5	100.0
#4 US MESH	4.75	97.9
#10 US MESH	2	96.7
#20 US MESH	0.85	92.8
#40 US MESH	0.425	87.7
#60 US MESH	0.25	75.1
#100 US MESH	0.15	56.7
#140 US MESH	0.106	45.6
#200 US MESH	0.075	37.3
	0.0468	20.9
	0.0340	15.8
	0.0219	12.0
	0.0127	10.1
	0.0090	8.8
	0.0064	7.7
	0.0045	7.2
	0.0031	6.8
	0.0013	4.9

BOULDER	COBBLE	GRAVEL		SAND			FINES (Silt, Clay)
		Coarse	Fine	Coarse	Medium	Fine	

LH/OA

11/9/2016

LH

11/15/2016

Tech

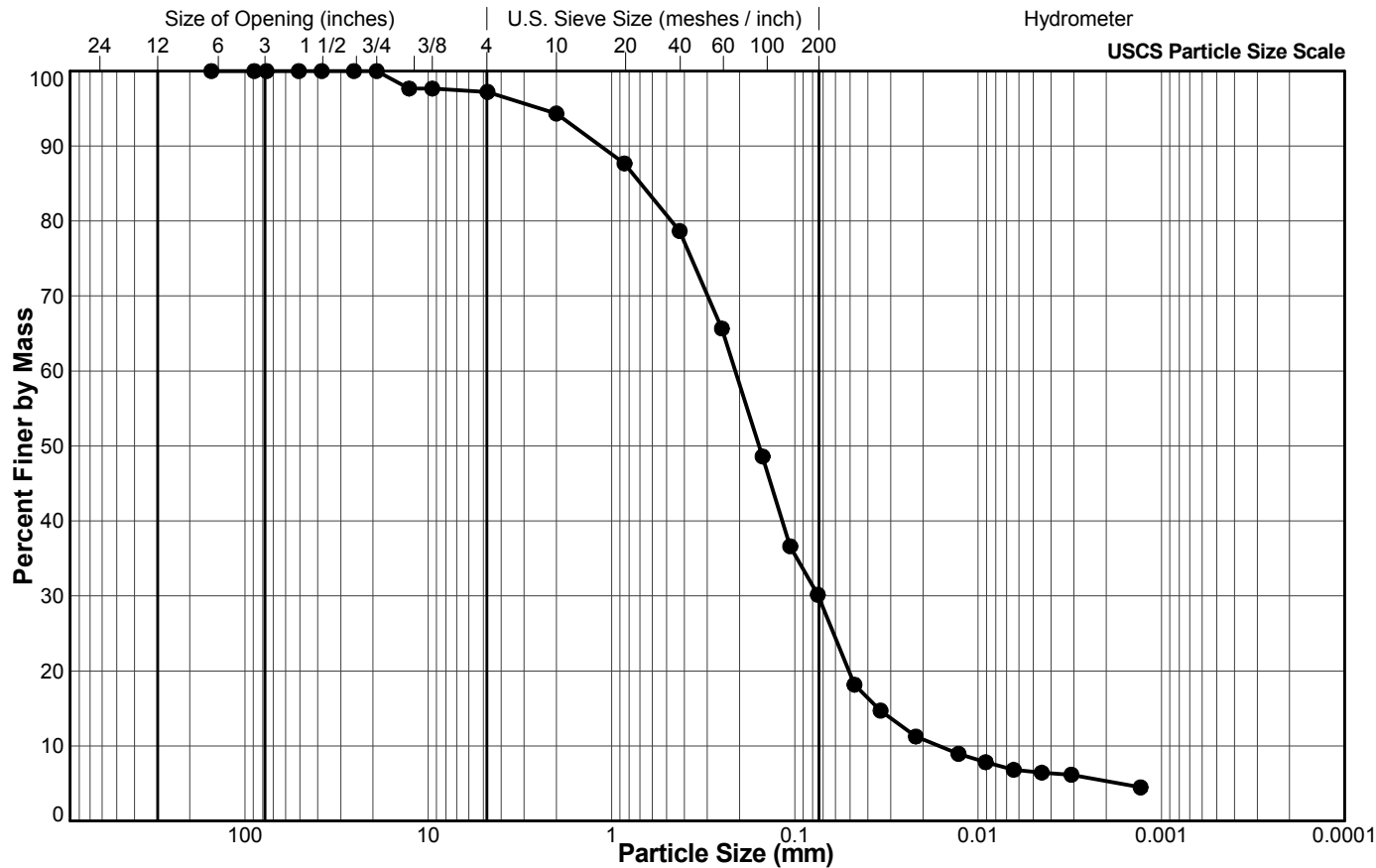
Date

Checked

Date

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: E-2C
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	97.7
3/8"	9.5	97.7
#4 US MESH	4.75	97.2
#10 US MESH	2	94.3
#20 US MESH	0.85	87.7
#40 US MESH	0.425	78.7
#60 US MESH	0.25	65.7
#100 US MESH	0.15	48.6
#140 US MESH	0.106	36.6
#200 US MESH	0.075	30.2
	0.0473	18.2
	0.0341	14.7
	0.0219	11.3
	0.0128	8.9
	0.0091	7.8
	0.0064	6.8
	0.0045	6.4
	0.0031	6.2
	0.0013	4.5

BOULDER		COBBLE		GRAVEL		SAND			FINES (Silt, Clay)
				Coarse	Fine	Coarse	Medium	Fine	

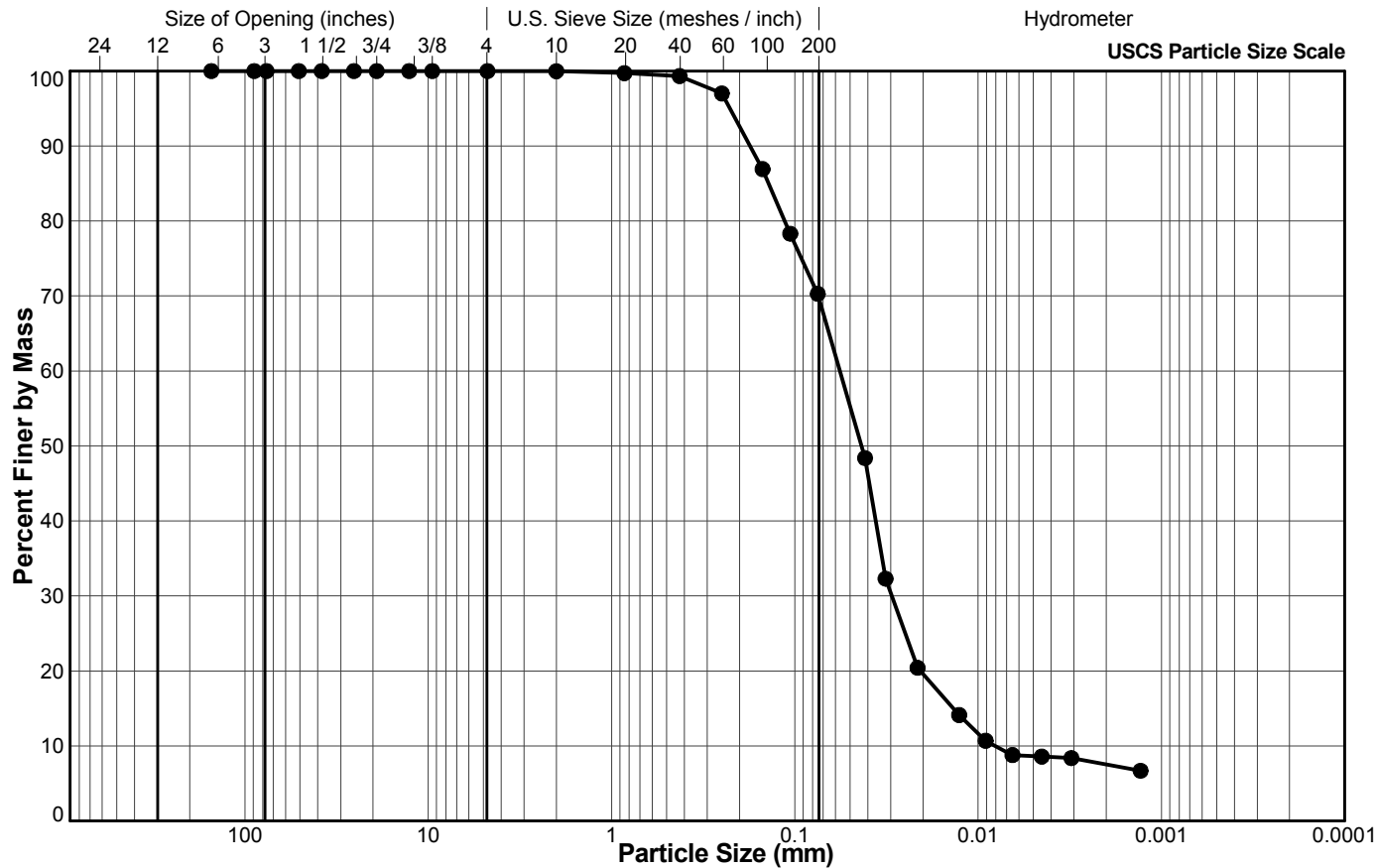
LH/OA
11/8/2016
LH
11/15/2016
Tech
Date
Checked
Date

SUMMARY OF PARTICLE SIZE DISTRIBUTION

ASTM D 422

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: E-3A
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.5	100.0
#4 US MESH	4.75	100.0
#10 US MESH	2	100.0
#20 US MESH	0.85	99.7
#40 US MESH	0.425	99.3
#60 US MESH	0.25	97.0
#100 US MESH	0.15	86.9
#140 US MESH	0.106	78.3
#200 US MESH	0.075	70.3
	0.0414	48.4
	0.0320	32.3
	0.0214	20.4
	0.0127	14.1
	0.0091	10.7
	0.0065	8.8
	0.0045	8.6
	0.0031	8.4
	0.0013	6.7

BOULDER		COBBLE		GRAVEL		SAND			FINES (Silt, Clay)
				Coarse	Fine	Coarse	Medium	Fine	

LH/OA

11/8/2016

LH

11/15/2016

Tech

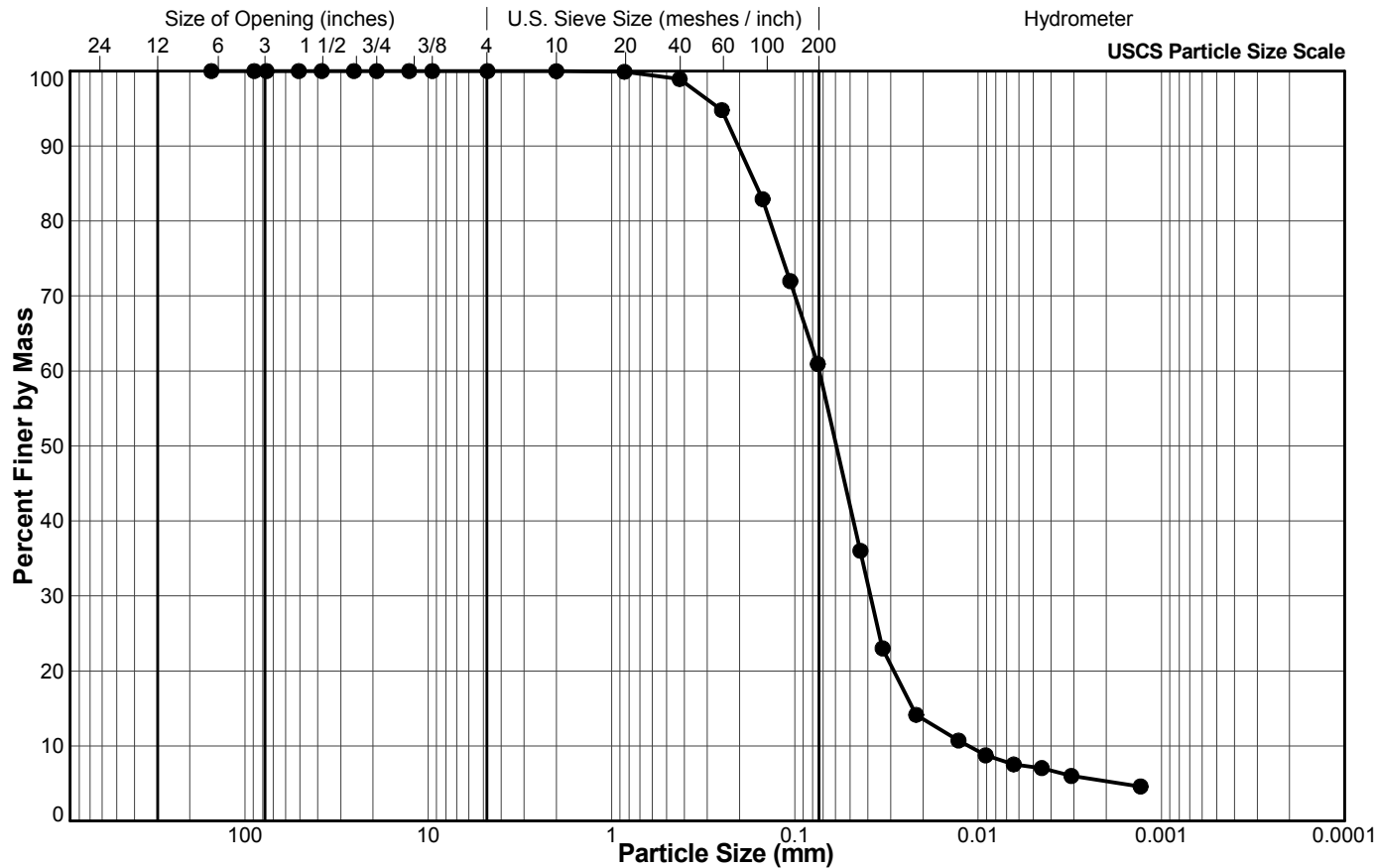
Date

Checked

Date

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: E-3B
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.5	100.0
#4 US MESH	4.75	100.0
#10 US MESH	2	100.0
#20 US MESH	0.85	99.9
#40 US MESH	0.425	98.9
#60 US MESH	0.25	94.8
#100 US MESH	0.15	82.9
#140 US MESH	0.106	72.0
#200 US MESH	0.075	60.9
	0.0439	36.0
	0.0332	23.0
	0.0218	14.1
	0.0128	10.7
	0.0091	8.7
	0.0064	7.5
	0.0045	7.0
	0.0031	6.0
	0.0013	4.6

BOULDER	COBBLE	GRAVEL		SAND			FINES (Silt, Clay)
		Coarse	Fine	Coarse	Medium	Fine	

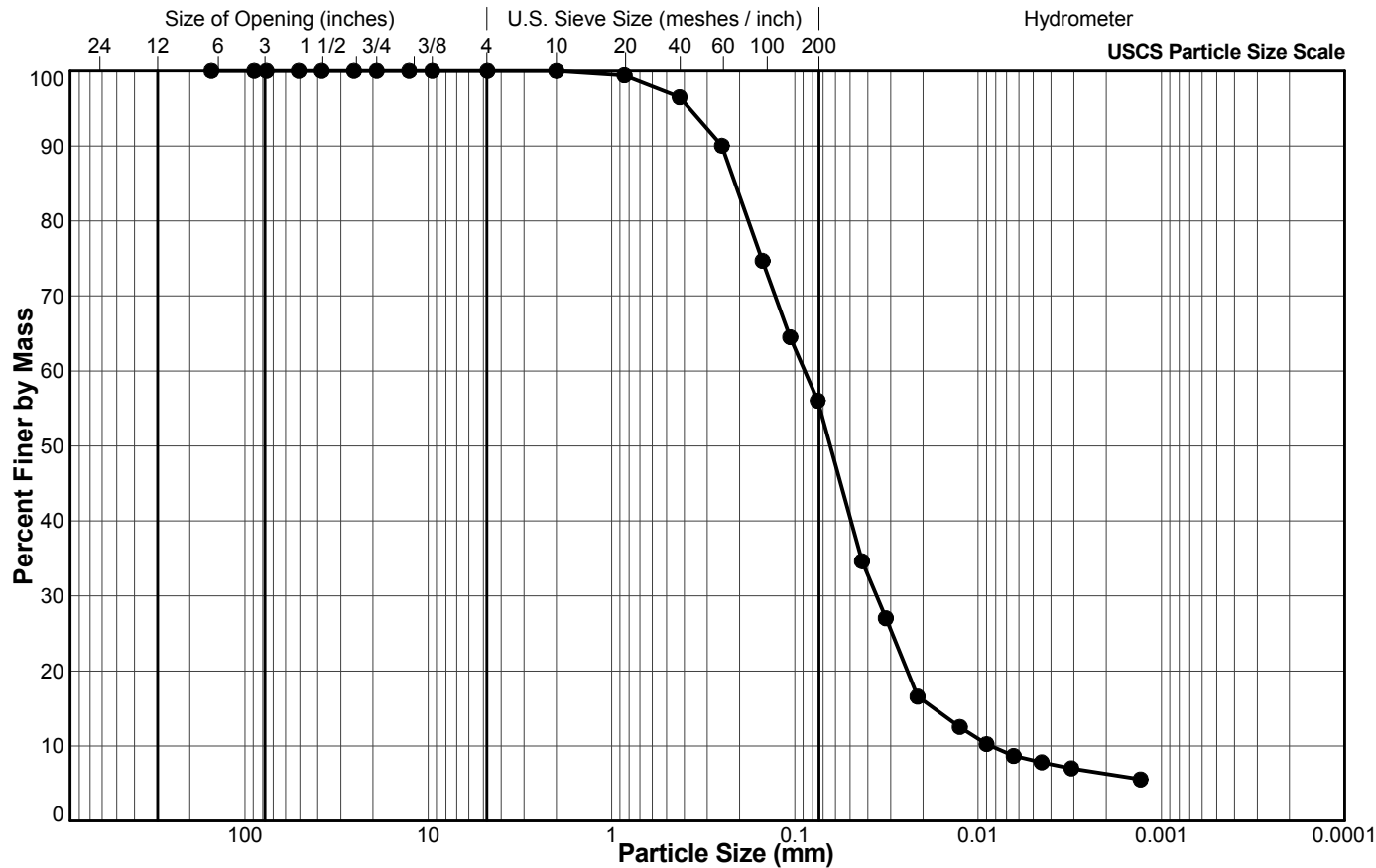
LH/OA
11/8/2016
LH
11/15/2016
Tech
Date
Checked
Date

SUMMARY OF PARTICLE SIZE DISTRIBUTION

ASTM D 422

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: E-3C
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.5	100.0
#4 US MESH	4.75	100.0
#10 US MESH	2	100.0
#20 US MESH	0.85	99.4
#40 US MESH	0.425	96.5
#60 US MESH	0.25	90.0
#100 US MESH	0.15	74.7
#140 US MESH	0.106	64.5
#200 US MESH	0.075	56.0
	0.0430	34.6
	0.0319	27.0
	0.0214	16.6
	0.0126	12.5
	0.0090	10.3
	0.0064	8.7
	0.0045	7.8
	0.0031	7.0
	0.0013	5.5

BOULDER		COBBLE		GRAVEL		SAND			FINES (Silt, Clay)
				Coarse	Fine	Coarse	Medium	Fine	

LH/OA

11/8/2016

LH

11/15/2016

Tech

Date

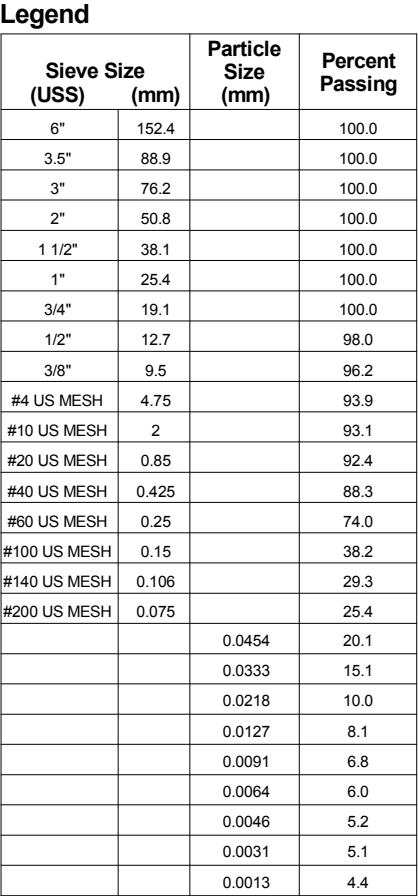
Checked

Date



Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

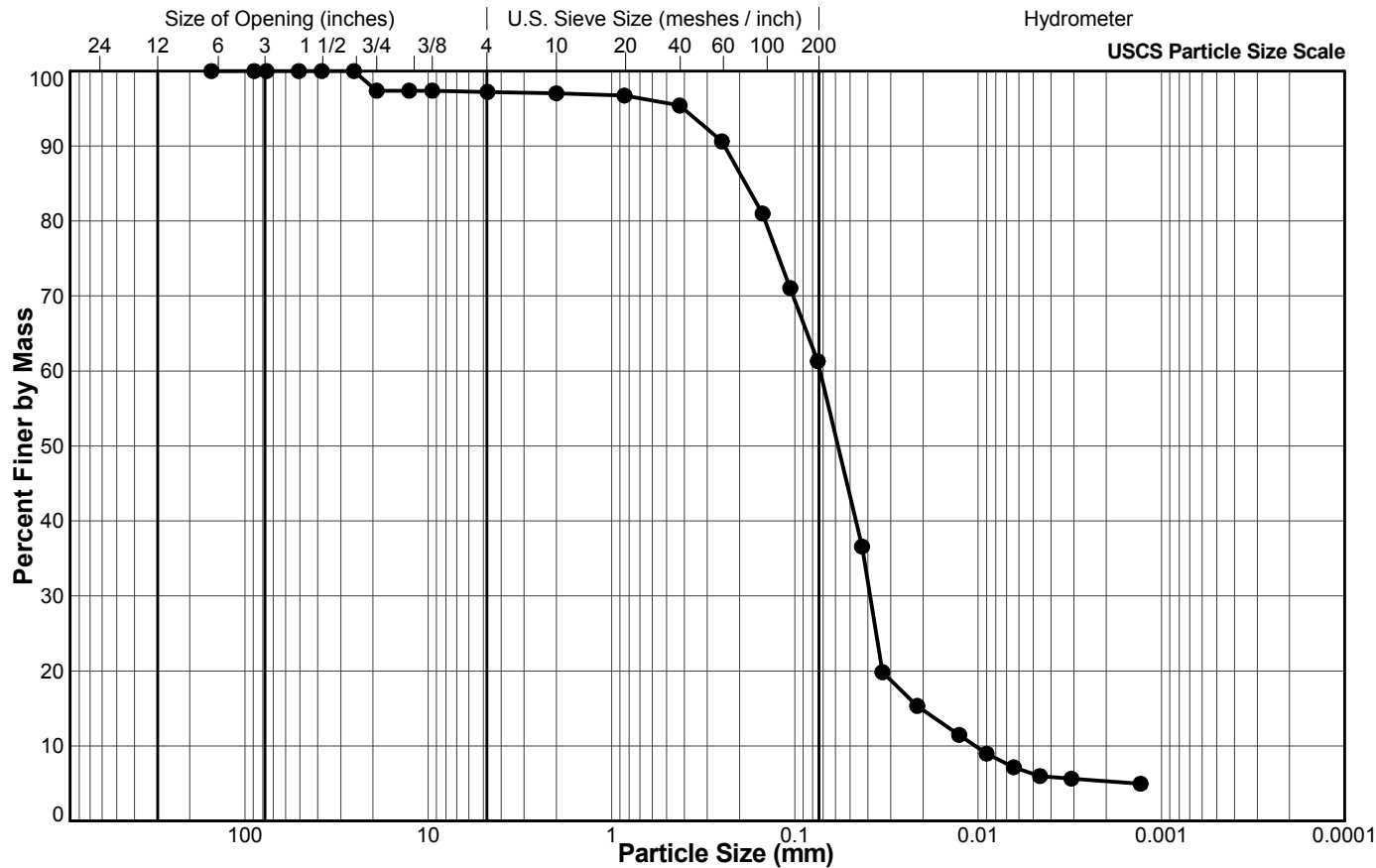
Sample Location: LaBerge
Sample No.: E-4A
Depth (m): N/A
Lab Schedule No.:



Date _____

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: E-4B
Depth (m): N/A
Lab Schedule No.:

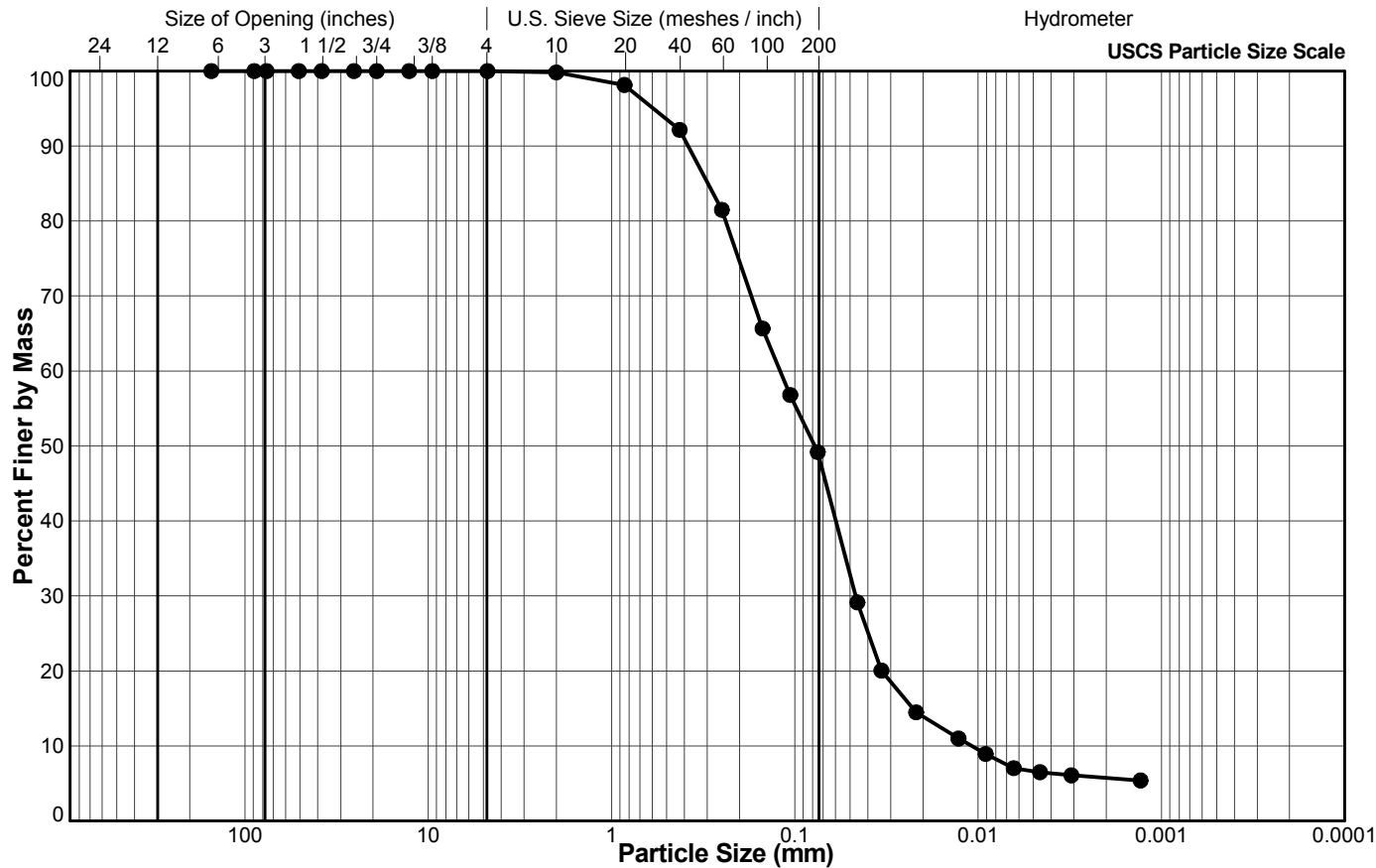


SUMMARY OF PARTICLE SIZE DISTRIBUTION

ASTM D 422

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: E-4C
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.5	100.0
#4 US MESH	4.75	100.0
#10 US MESH	2	99.8
#20 US MESH	0.85	98.1
#40 US MESH	0.425	92.2
#60 US MESH	0.25	81.5
#100 US MESH	0.15	65.7
#140 US MESH	0.106	56.8
#200 US MESH	0.075	49.2
	0.0456	29.1
	0.0337	20.0
	0.0218	14.5
	0.0128	11.0
	0.0091	8.9
	0.0064	7.0
	0.0046	6.5
	0.0031	6.1
	0.0013	5.4

BOULDER	COBBLE	GRAVEL		SAND			FINES (Silt, Clay)
		Coarse	Fine	Coarse	Medium	Fine	

LH/OA

11/8/2016

LH

11/15/2016

Tech

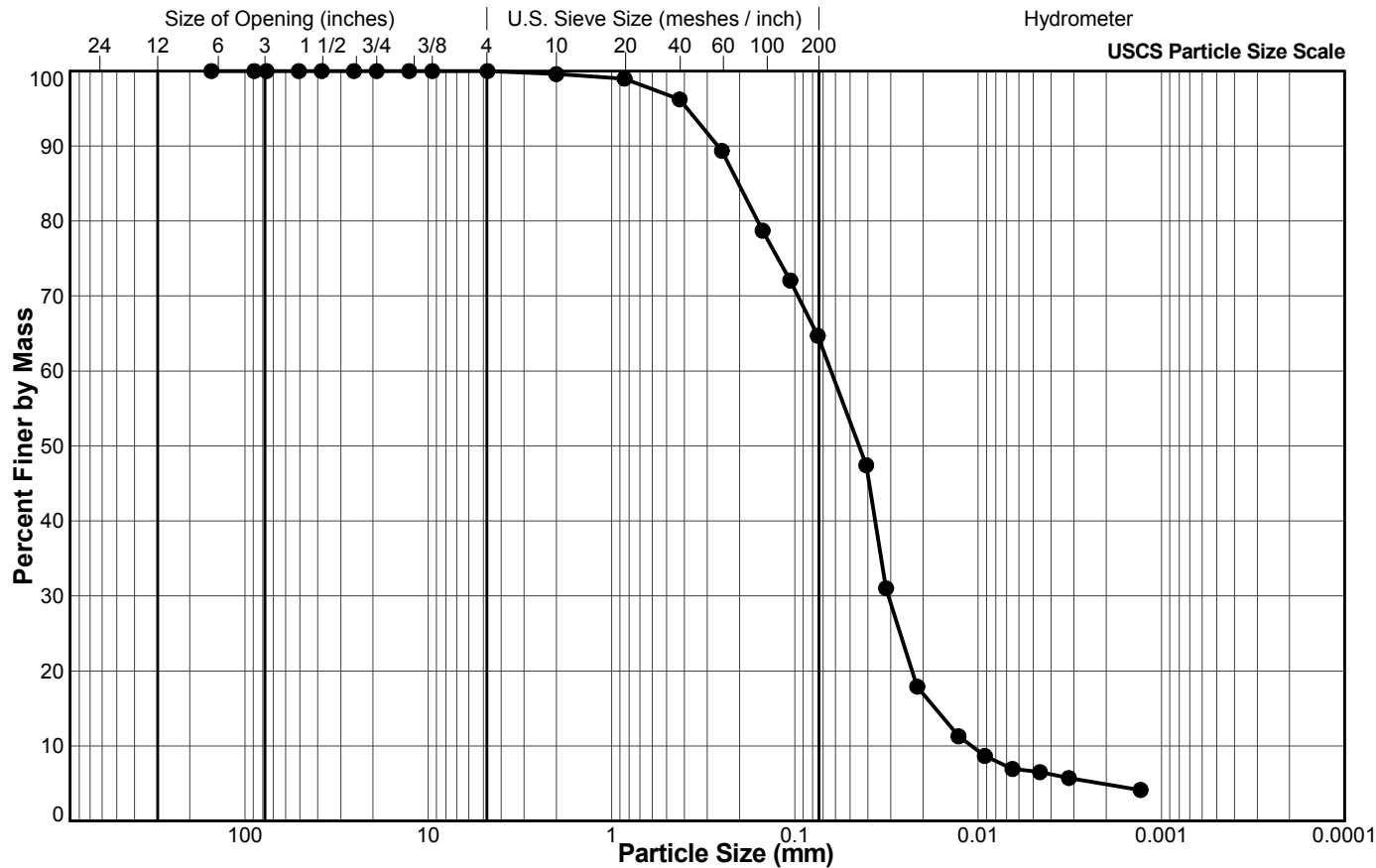
Date

Checked

Date

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: E-6A
Depth (m): N/A
Lab Schedule No.:

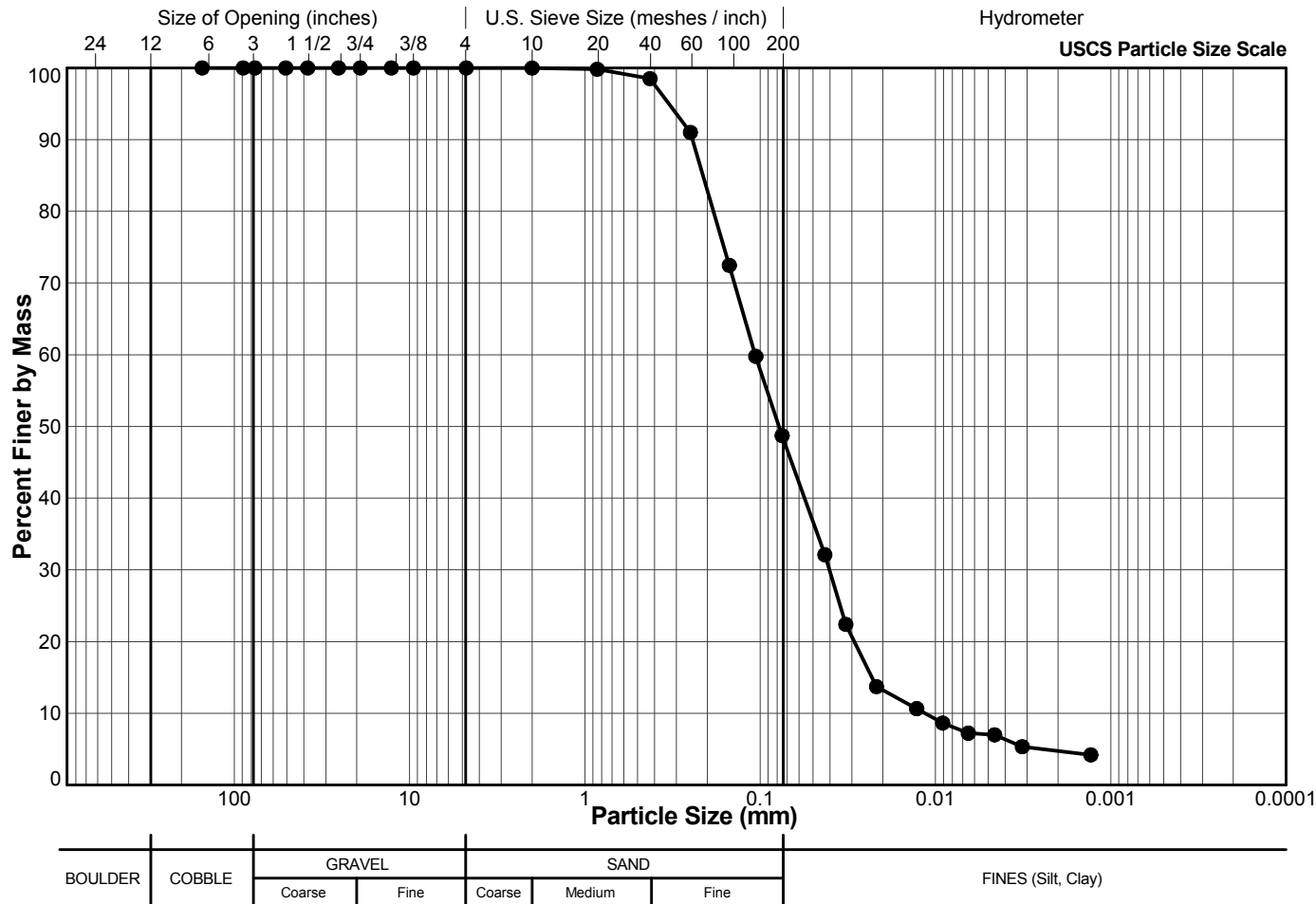


SUMMARY OF PARTICLE SIZE DISTRIBUTION

ASTM D 422

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: E-6B
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.5	100.0
#4 US MESH	4.75	100.0
#10 US MESH	2	100.0
#20 US MESH	0.85	99.8
#40 US MESH	0.425	98.5
#60 US MESH	0.25	91.0
#100 US MESH	0.15	72.5
#140 US MESH	0.106	59.8
#200 US MESH	0.075	48.7
	0.0428	32.1
	0.0325	22.4
	0.0217	13.7
	0.0128	10.6
	0.0091	8.6
	0.0065	7.2
	0.0046	7.0
	0.0032	5.3
	0.0013	4.2

LH/OA

11/8/2016

LH

11/15/2016

Tech

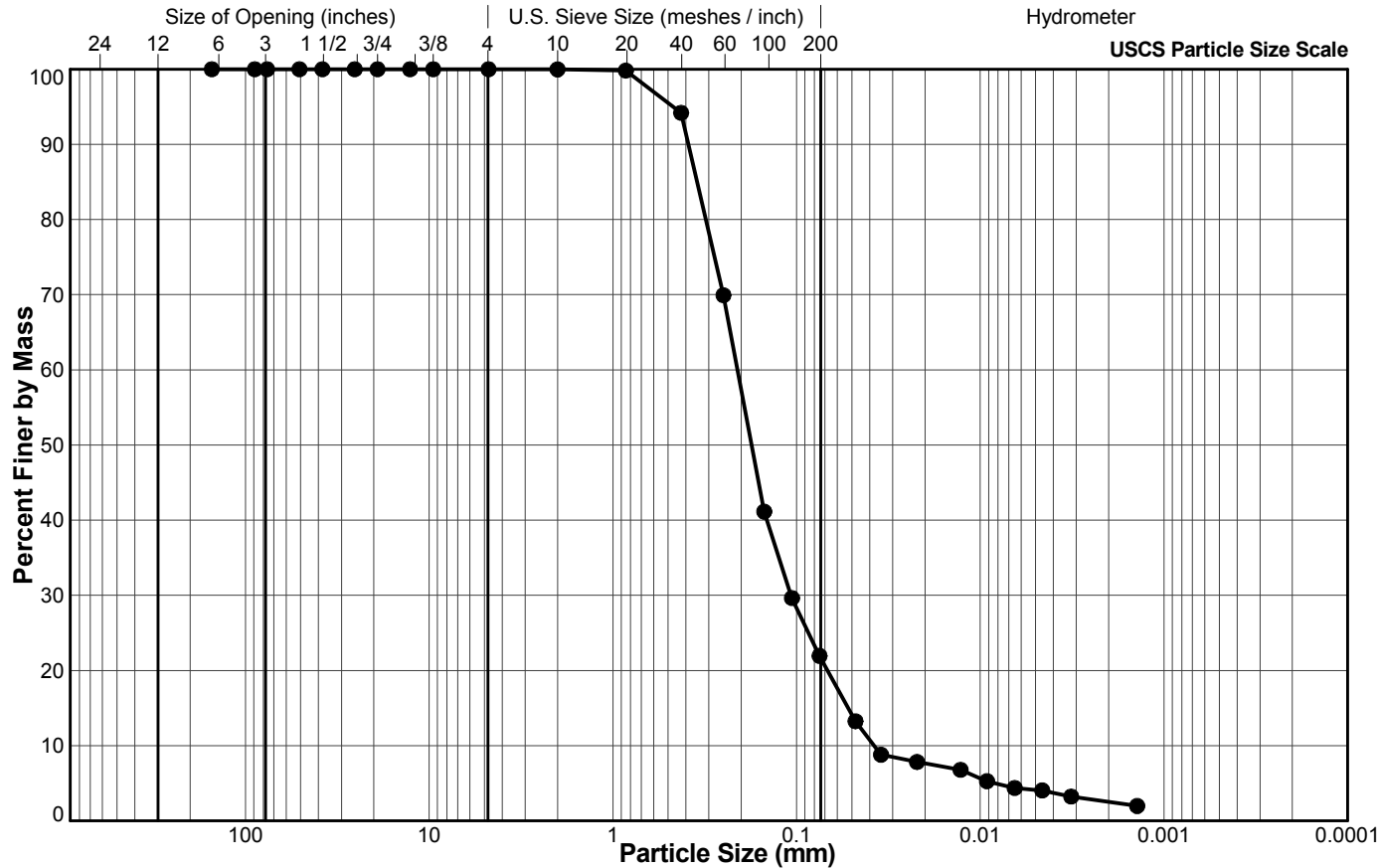
Date

Checked

Date

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: E-6C
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.5	100.0
#4 US MESH	4.75	100.0
#10 US MESH	2	100.0
#20 US MESH	0.85	99.8
#40 US MESH	0.425	94.2
#60 US MESH	0.25	69.9
#100 US MESH	0.15	41.1
#140 US MESH	0.106	29.6
#200 US MESH	0.075	21.9
	0.0475	13.2
	0.0347	8.8
	0.0221	7.8
	0.0125	6.8
	0.0092	5.3
	0.0065	4.4
	0.0046	4.0
	0.0032	3.2
	0.0014	2.0

BOULDER	COBBLE	GRAVEL		SAND			FINES (Silt, Clay)
		Coarse	Fine	Coarse	Medium	Fine	

LH/OA

11/10/2016

LH

11/15/2016

Tech

Date

Checked

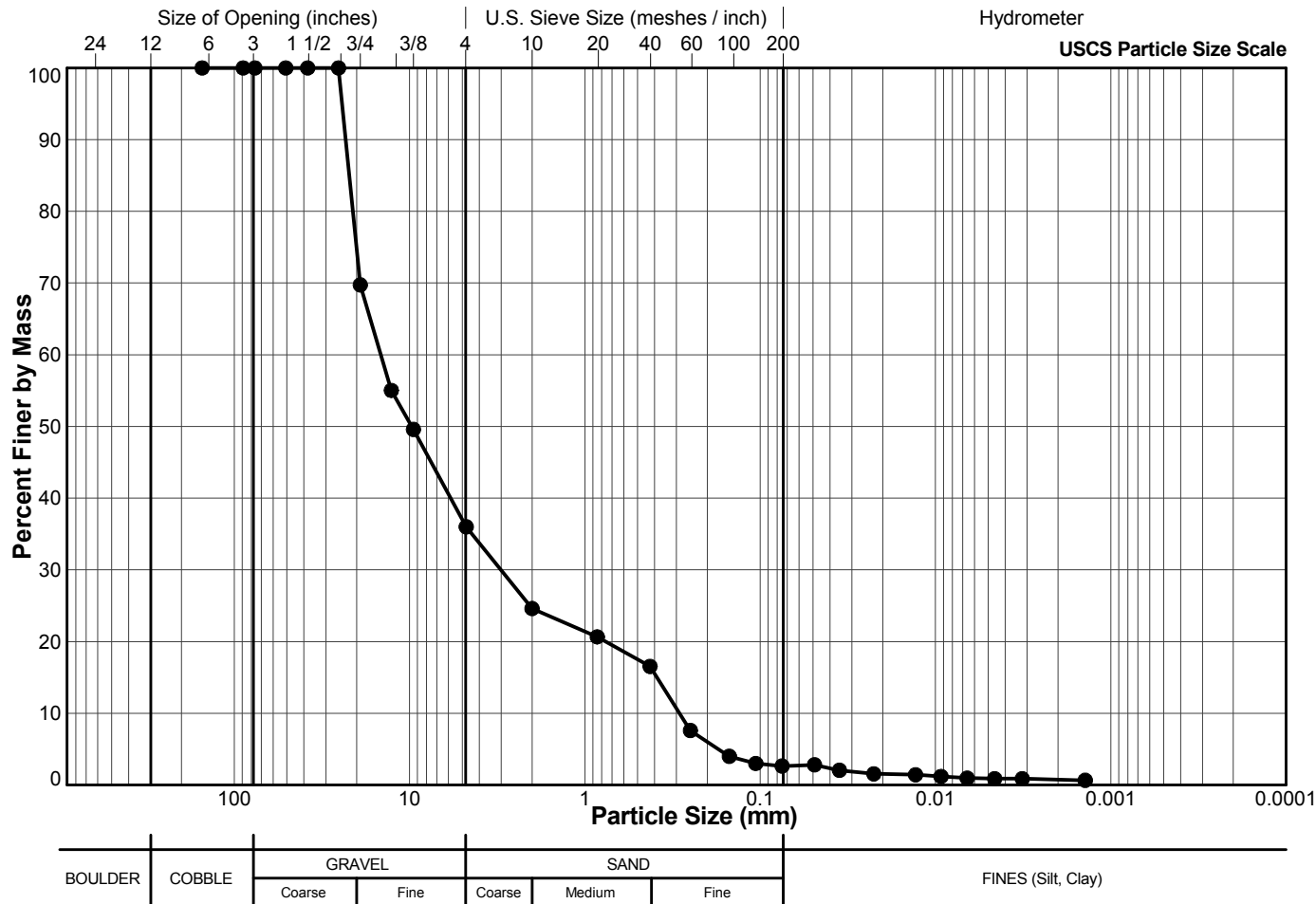
Date

SUMMARY OF PARTICLE SIZE DISTRIBUTION

ASTM D 422

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: E-8A
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	69.7
1/2"	12.7	55.0
3/8"	9.5	49.6
#4 US MESH	4.75	36.0
#10 US MESH	2	24.6
#20 US MESH	0.85	20.7
#40 US MESH	0.425	16.5
#60 US MESH	0.25	7.6
#100 US MESH	0.15	4.0
#140 US MESH	0.106	3.0
#200 US MESH	0.075	2.6
	0.0490	2.8
	0.0353	2.1
	0.0225	1.6
	0.0130	1.4
	0.0093	1.2
	0.0066	1.0
	0.0046	0.9
	0.0032	0.9
	0.0014	0.7

LH/OA

11/8/2016

LH

11/15/2016

Tech

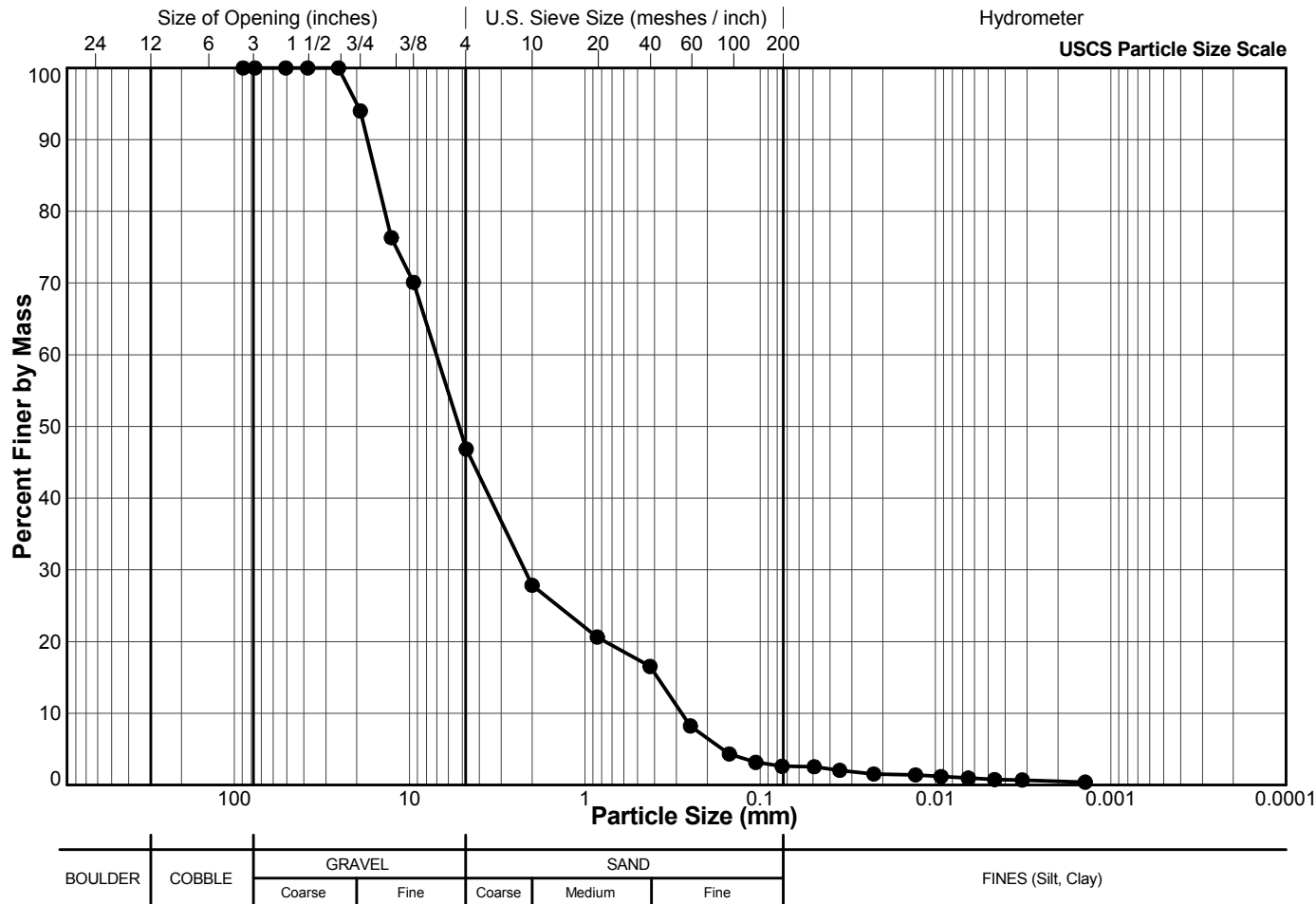
Date

Checked

Date

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: E-8B
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	94.0
1/2"	12.7	76.3
3/8"	9.5	70.1
#4 US MESH	4.75	46.8
#10 US MESH	2	27.9
#20 US MESH	0.85	20.6
#40 US MESH	0.425	16.5
#60 US MESH	0.25	8.2
#100 US MESH	0.15	4.3
#140 US MESH	0.106	3.2
#200 US MESH	0.075	2.6
	0.0492	2.5
	0.0352	2.0
	0.0225	1.5
	0.0130	1.4
	0.0093	1.2
	0.0065	1.0
	0.0046	0.8
	0.0032	0.7
	0.0014	0.4

LH/OA

11/9/2016

LH

11/15/2016

Tech

Date

Checked

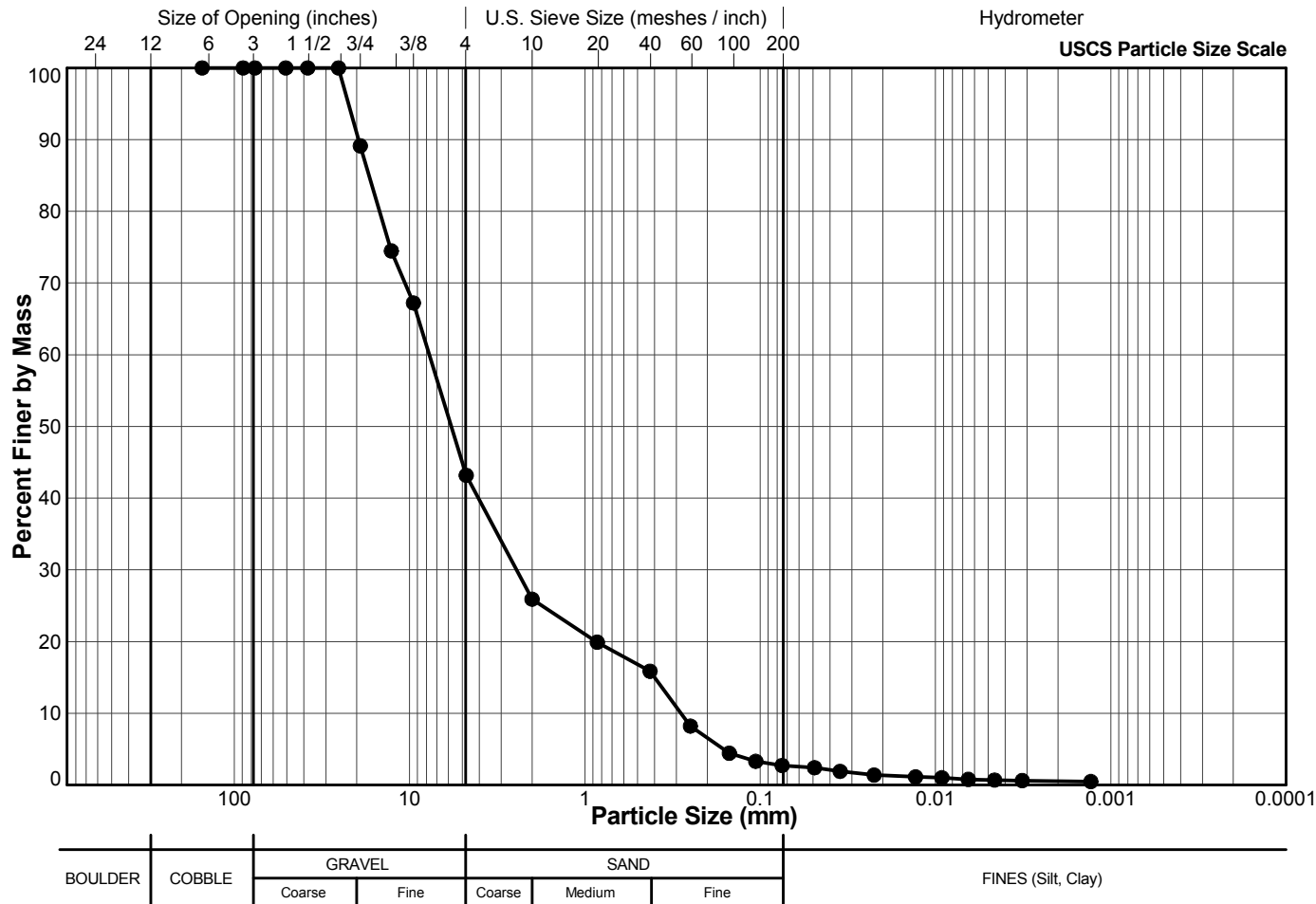
Date

SUMMARY OF PARTICLE SIZE DISTRIBUTION

ASTM D 422

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: E-8C
Depth (m): N/A
Lab Schedule No.:

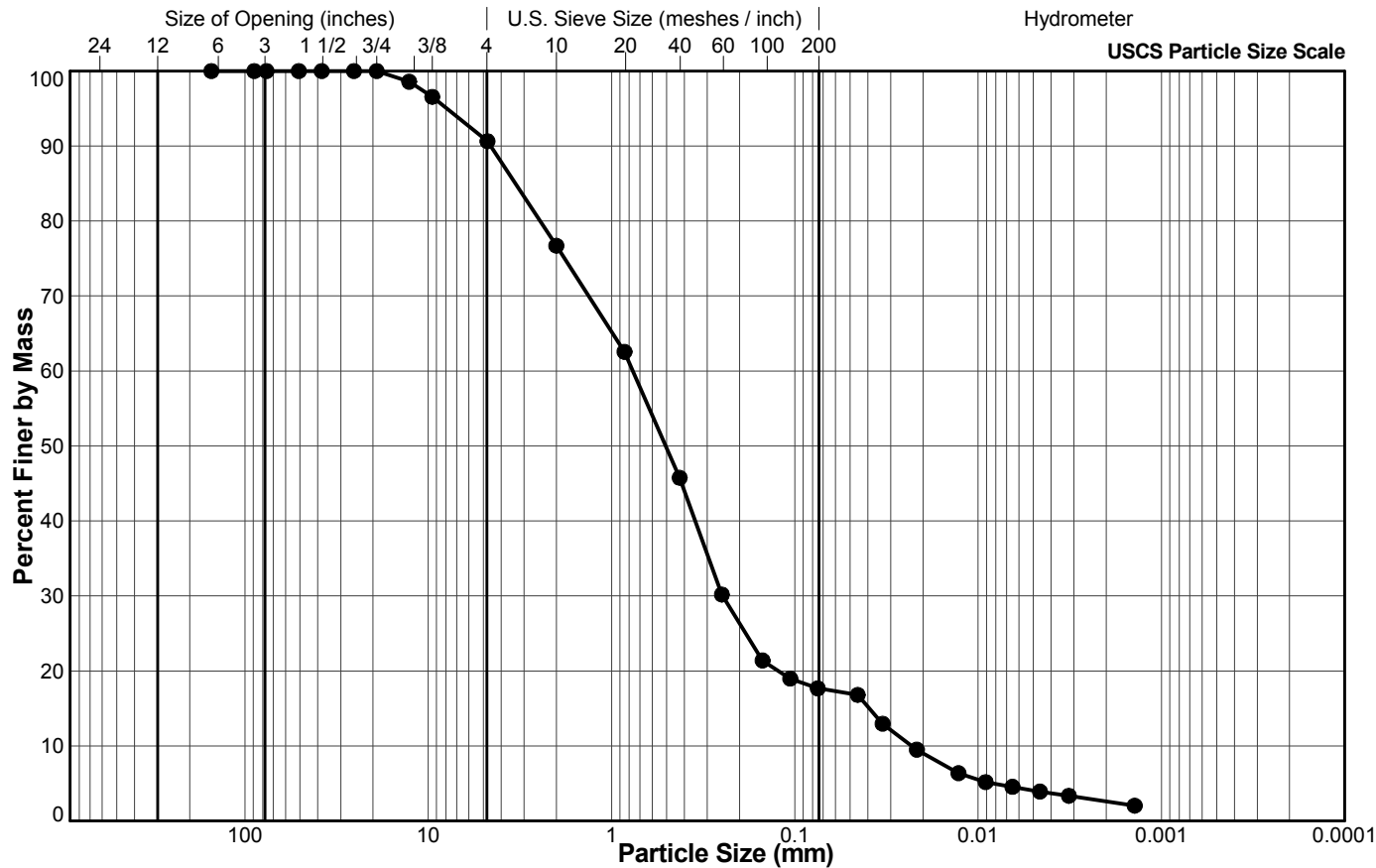


SUMMARY OF PARTICLE SIZE DISTRIBUTION

ASTM D 422

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: PORCUPINE CR-A
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	98.6
3/8"	9.5	96.6
#4 US MESH	4.75	90.6
#10 US MESH	2	76.7
#20 US MESH	0.85	62.6
#40 US MESH	0.425	45.8
#60 US MESH	0.25	30.2
#100 US MESH	0.15	21.4
#140 US MESH	0.106	19.0
#200 US MESH	0.075	17.7
	0.0454	16.8
	0.0332	13.0
	0.0216	9.5
	0.0128	6.4
	0.0091	5.2
	0.0065	4.5
	0.0046	3.9
	0.0032	3.3
	0.0014	2.0

BOULDER	COBBLE	GRAVEL		SAND			FINES (Silt, Clay)
		Coarse	Fine	Coarse	Medium	Fine	

LH/OA

11/10/2016

LH

11/15/2016

Tech

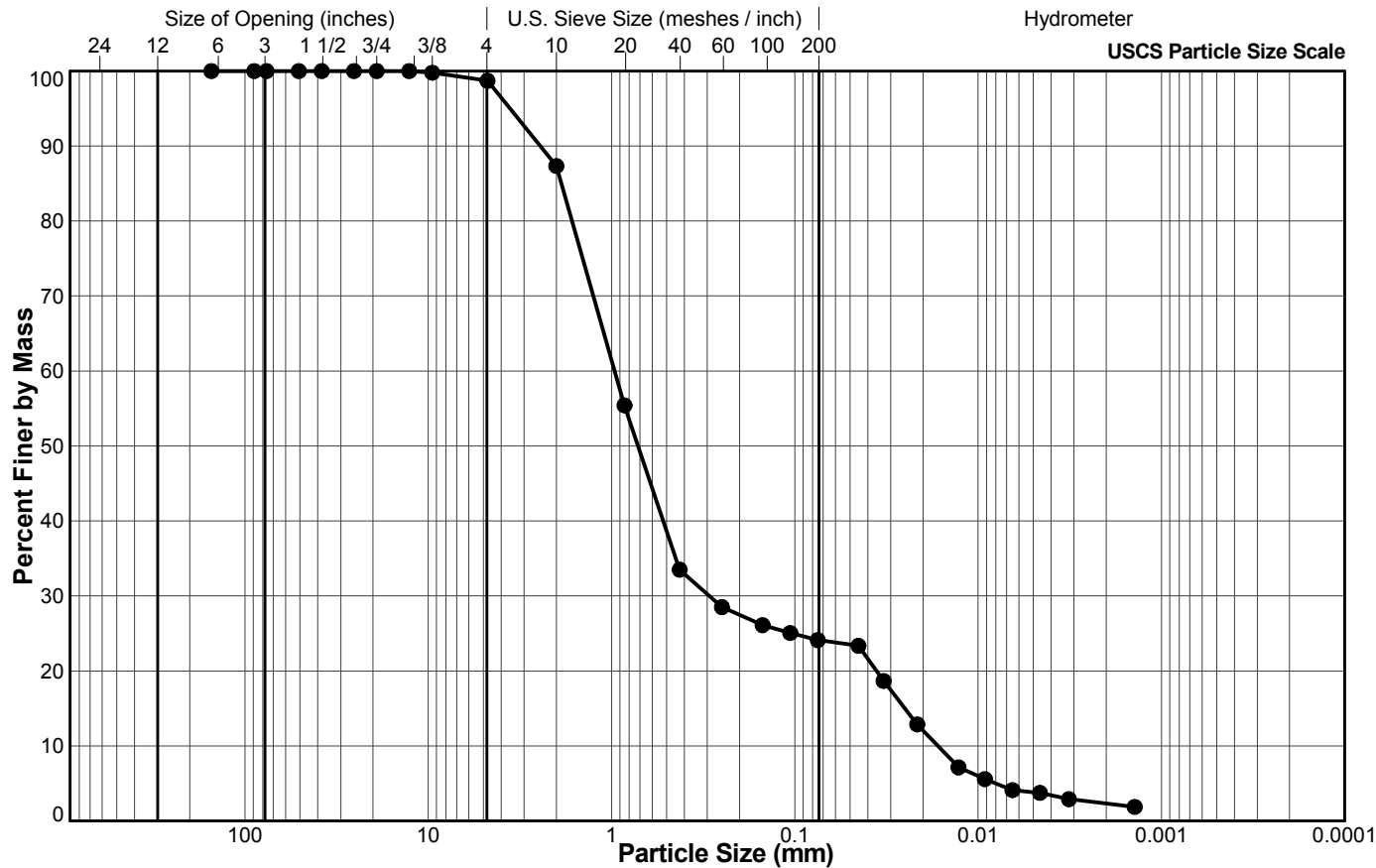
Date

Checked

Date

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: PORCUPINE CR-B
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.5	99.8
#4 US MESH	4.75	98.7
#10 US MESH	2	87.3
#20 US MESH	0.85	55.4
#40 US MESH	0.425	33.5
#60 US MESH	0.25	28.5
#100 US MESH	0.15	26.1
#140 US MESH	0.106	25.1
#200 US MESH	0.075	24.1
	0.0450	23.4
	0.0328	18.7
	0.0215	12.9
	0.0128	7.1
	0.0092	5.6
	0.0065	4.1
	0.0046	3.7
	0.0032	2.9
	0.0014	1.9

BOULDER		COBBLE		GRAVEL		SAND			FINES (Silt, Clay)
				Coarse	Fine	Coarse	Medium	Fine	

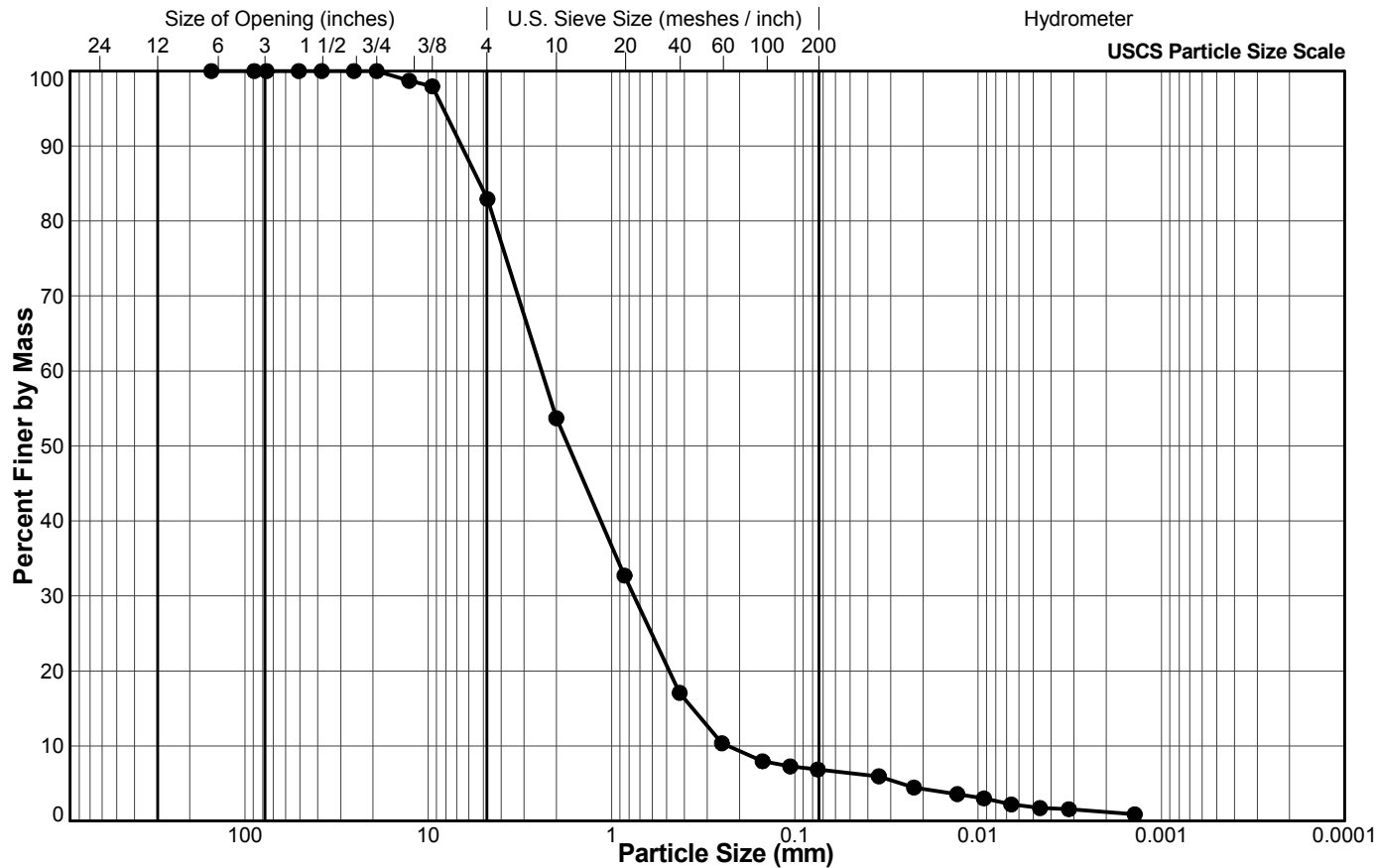
LH/OA
11/10/2016
LH
11/15/2016
Tech
Date
Checked
Date

SUMMARY OF PARTICLE SIZE DISTRIBUTION

ASTM D 422

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: PORCUPINE CR-C
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	98.7
3/8"	9.5	98.0
#4 US MESH	4.75	82.9
#10 US MESH	2	53.7
#20 US MESH	0.85	32.7
#40 US MESH	0.425	17.1
#60 US MESH	0.25	10.4
#100 US MESH	0.15	7.9
#140 US MESH	0.106	7.3
#200 US MESH	0.075	6.9
	0.0348	5.9
	0.0224	4.5
	0.0130	3.6
	0.0093	3.0
	0.0066	2.2
	0.0046	1.7
	0.0032	1.6
	0.0014	0.9

BOULDER	COBBLE	GRAVEL		SAND			FINES (Silt, Clay)
		Coarse	Fine	Coarse	Medium	Fine	

LH/OA

11/10/2016

LH

11/15/2016

Tech

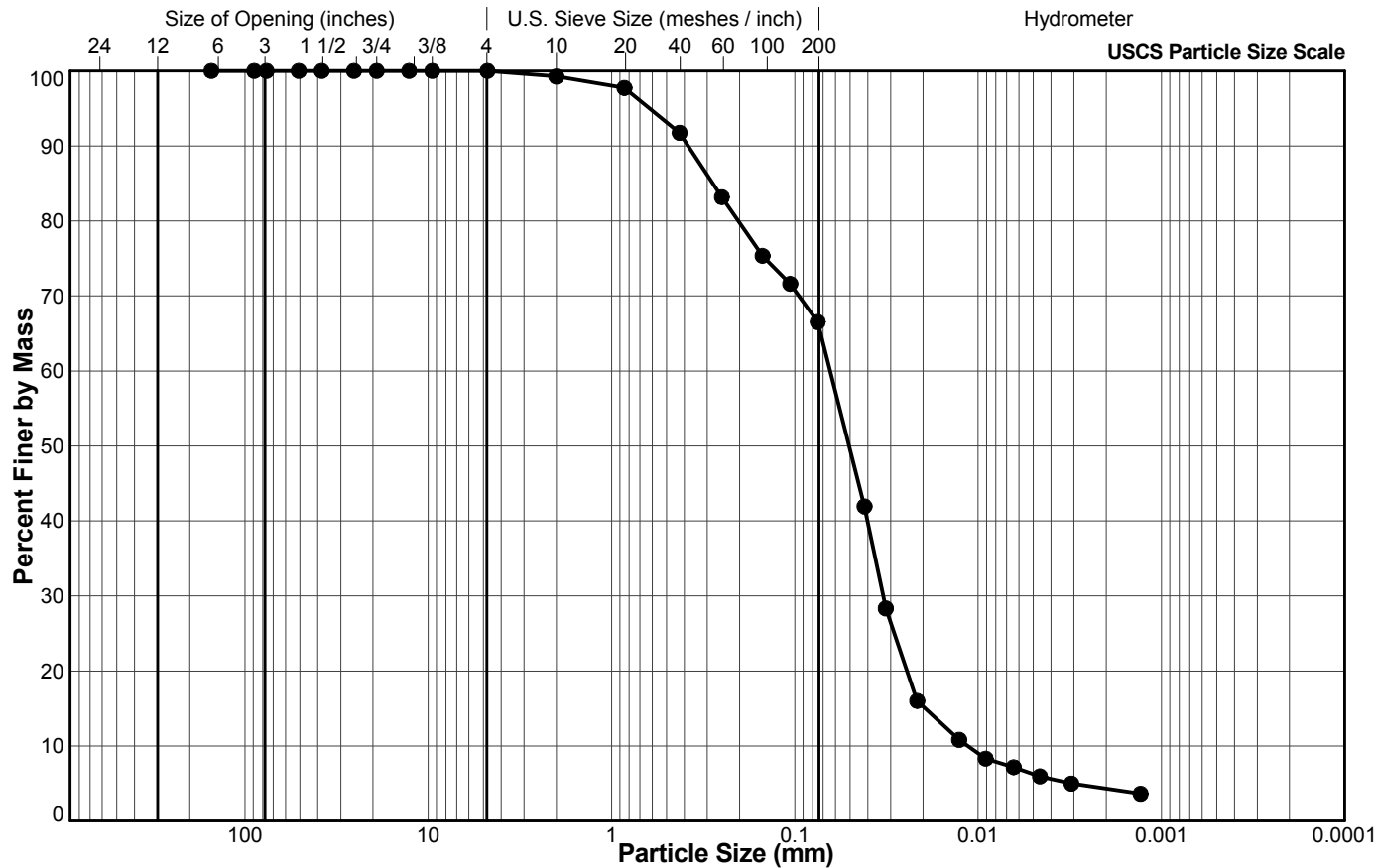
Date

Checked

Date

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: R-2A
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.5	100.0
#4 US MESH	4.75	100.0
#10 US MESH	2	99.3
#20 US MESH	0.85	97.7
#40 US MESH	0.425	91.8
#60 US MESH	0.25	83.2
#100 US MESH	0.15	75.4
#140 US MESH	0.106	71.6
#200 US MESH	0.075	66.5
	0.0417	41.9
	0.0319	28.3
	0.0215	16.0
	0.0127	10.8
	0.0091	8.3
	0.0064	7.2
	0.0046	5.9
	0.0031	5.0
	0.0013	3.6

BOULDER		COBBLE		GRAVEL		SAND			FINES (Silt, Clay)
				Coarse	Fine	Coarse	Medium	Fine	

LH/OA

11/10/2016

LH

11/15/2016

Tech

Date

Checked

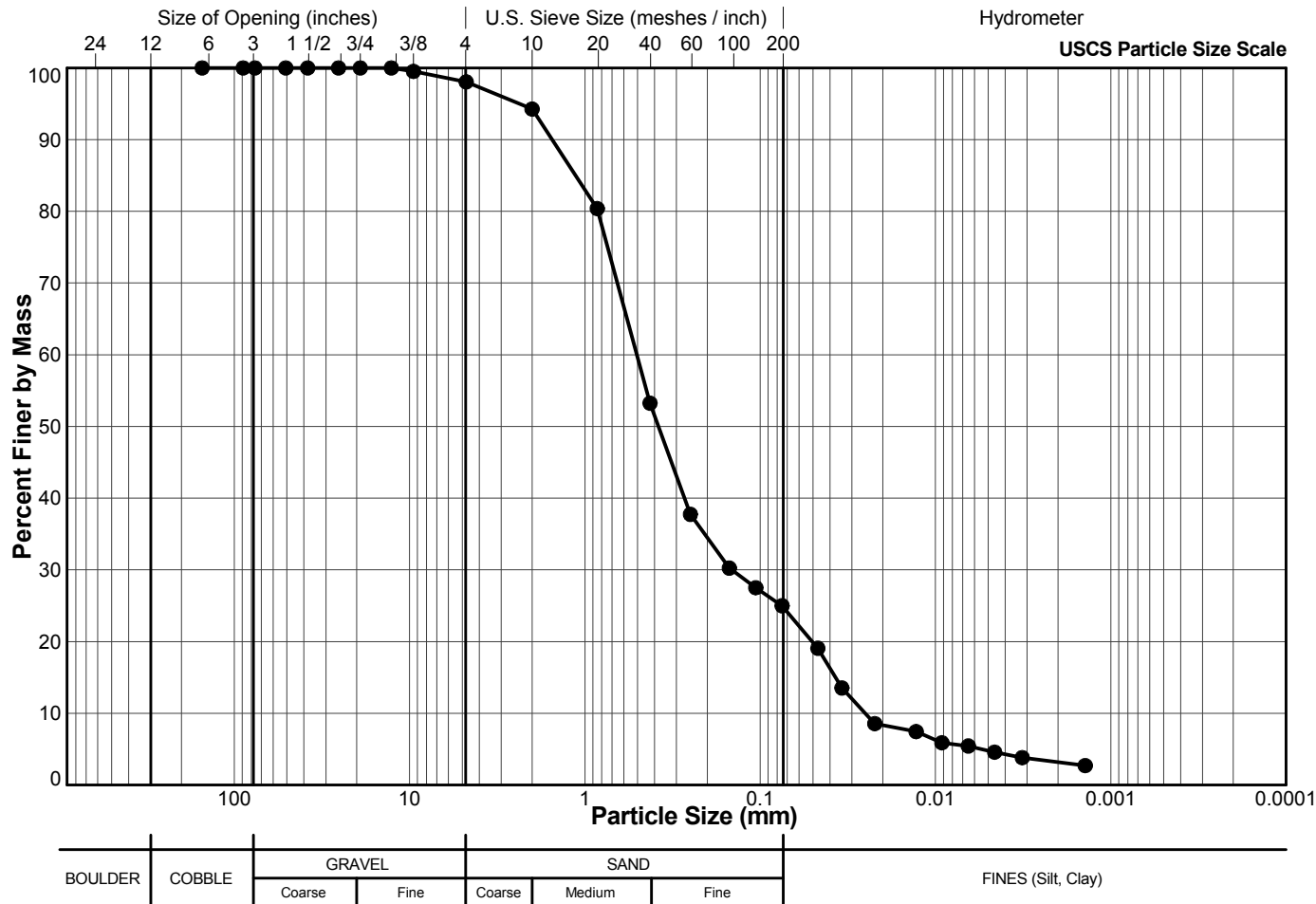
Date

SUMMARY OF PARTICLE SIZE DISTRIBUTION

ASTM D 422

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: R-2B
Depth (m): N/A
Lab Schedule No.:

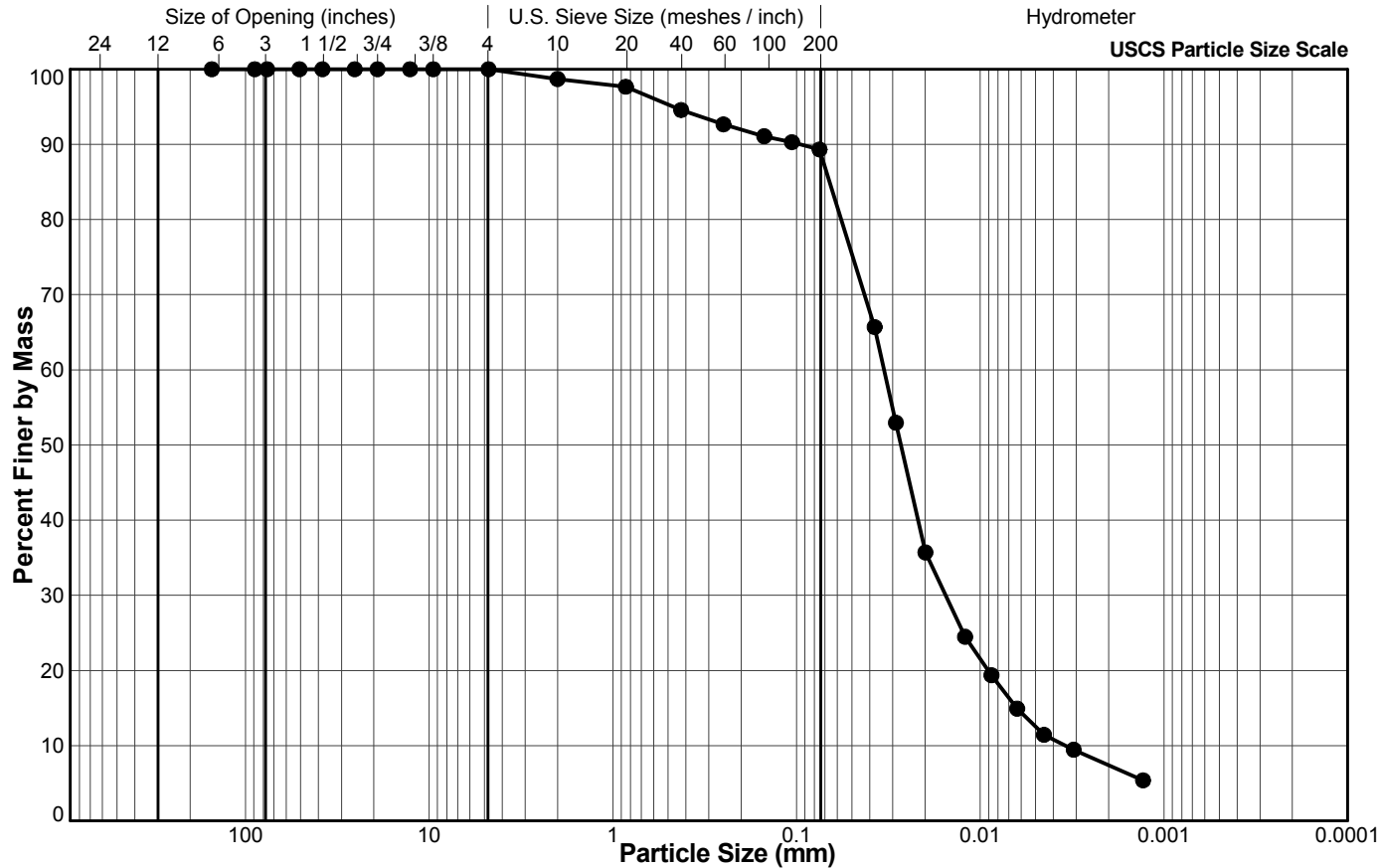


SUMMARY OF PARTICLE SIZE DISTRIBUTION

ASTM D 422

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: R-2C
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.5	100.0
#4 US MESH	4.75	100.0
#10 US MESH	2	98.7
#20 US MESH	0.85	97.7
#40 US MESH	0.425	94.6
#60 US MESH	0.25	92.7
#100 US MESH	0.15	91.1
#140 US MESH	0.106	90.3
#200 US MESH	0.075	89.3
	0.0376	65.7
	0.0288	53.0
	0.0199	35.7
	0.0121	24.5
	0.0087	19.4
	0.0063	14.9
	0.0045	11.4
	0.0031	9.5
	0.0013	5.4

BOULDER	COBBLE	GRAVEL		SAND			FINES (Silt, Clay)
		Coarse	Fine	Coarse	Medium	Fine	

LH/OA

11/10/2016

LH

11/15/2016

Tech

Date

Checked

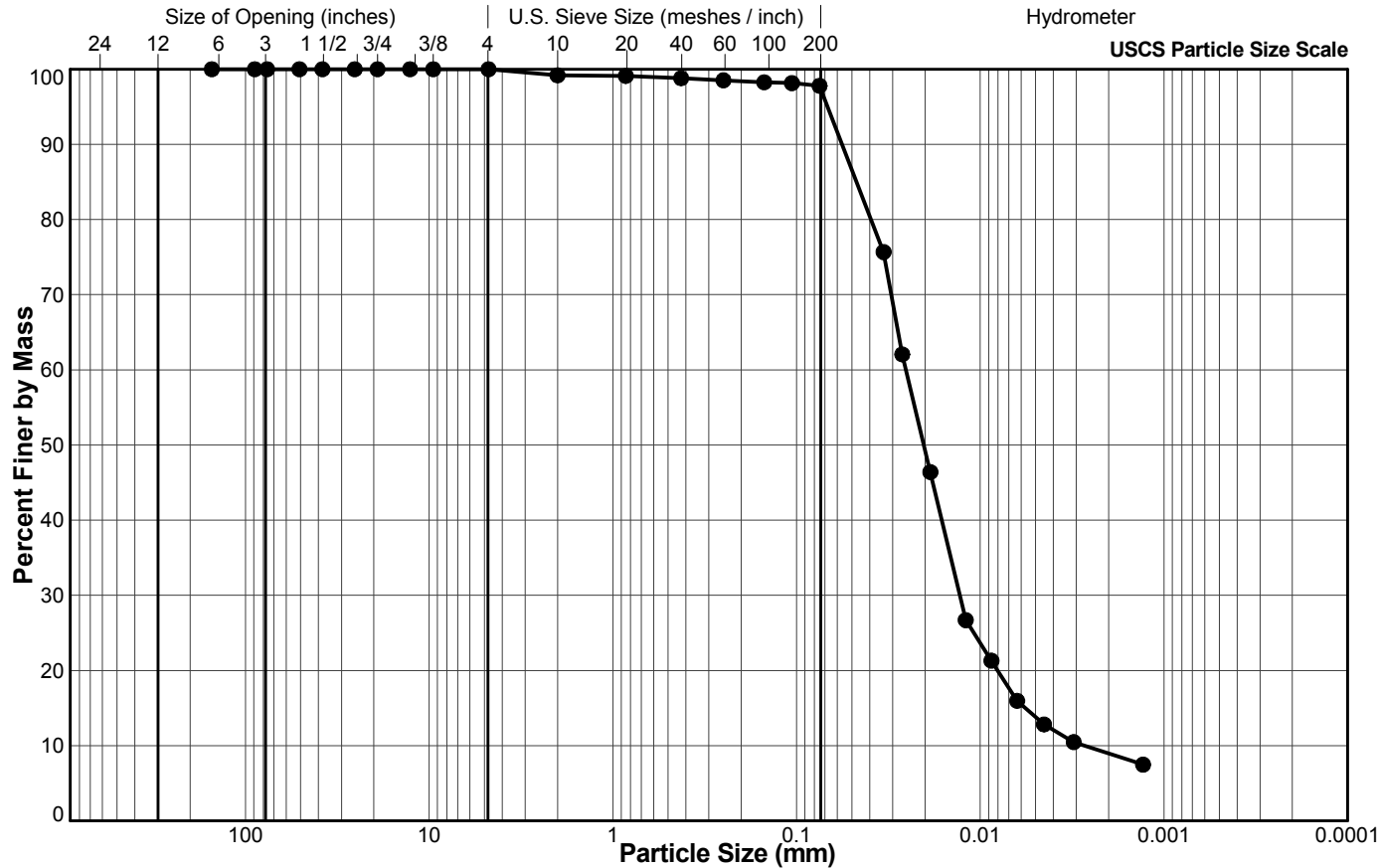
Date

SUMMARY OF PARTICLE SIZE DISTRIBUTION

ASTM D 422

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: R-3C
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.5	100.0
#4 US MESH	4.75	100.0
#10 US MESH	2	99.2
#20 US MESH	0.85	99.1
#40 US MESH	0.425	98.8
#60 US MESH	0.25	98.5
#100 US MESH	0.15	98.3
#140 US MESH	0.106	98.2
#200 US MESH	0.075	97.8
	0.0336	75.7
	0.0266	62.1
	0.0187	46.4
	0.0120	26.7
	0.0087	21.3
	0.0063	16.0
	0.0045	12.8
	0.0031	10.5
	0.0013	7.5

BOULDER		COBBLE		GRAVEL		SAND			FINES (Silt, Clay)
				Coarse	Fine	Coarse	Medium	Fine	

LH/OA

11/10/2016

LH

11/15/2016

Tech

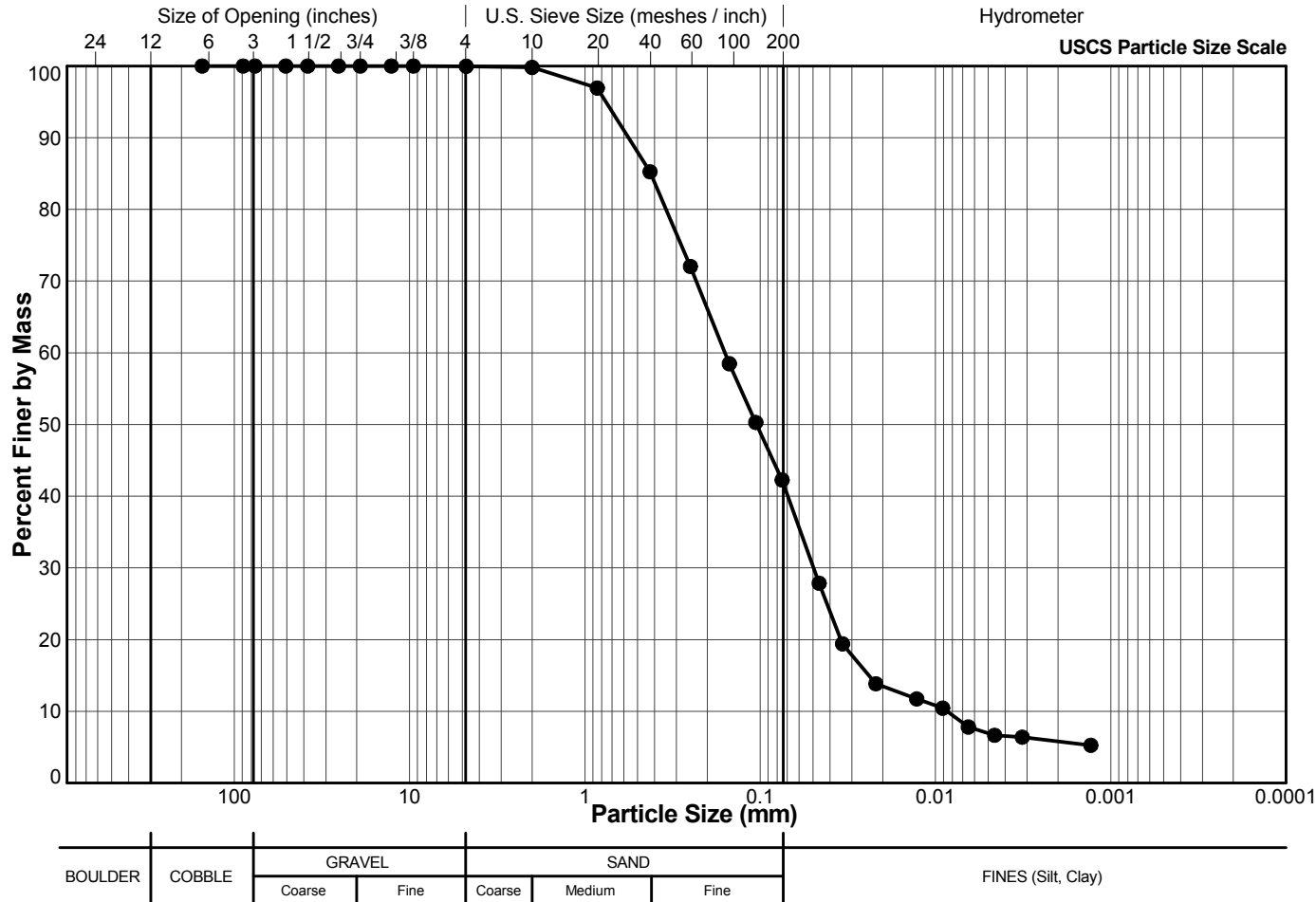
Date

Checked

Date

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: R-4A
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.5	100.0
#4 US MESH	4.75	100.0
#10 US MESH	2	99.8
#20 US MESH	0.85	96.9
#40 US MESH	0.425	85.3
#60 US MESH	0.25	72.0
#100 US MESH	0.15	58.5
#140 US MESH	0.106	50.3
#200 US MESH	0.075	42.3
	0.0461	27.9
	0.0339	19.4
	0.0219	13.8
	0.0128	11.7
	0.0091	10.4
	0.0065	7.8
	0.0046	6.7
	0.0032	6.4
	0.0013	5.3

LH/OA

11/9/2016

LH

11/15/2016

Tech

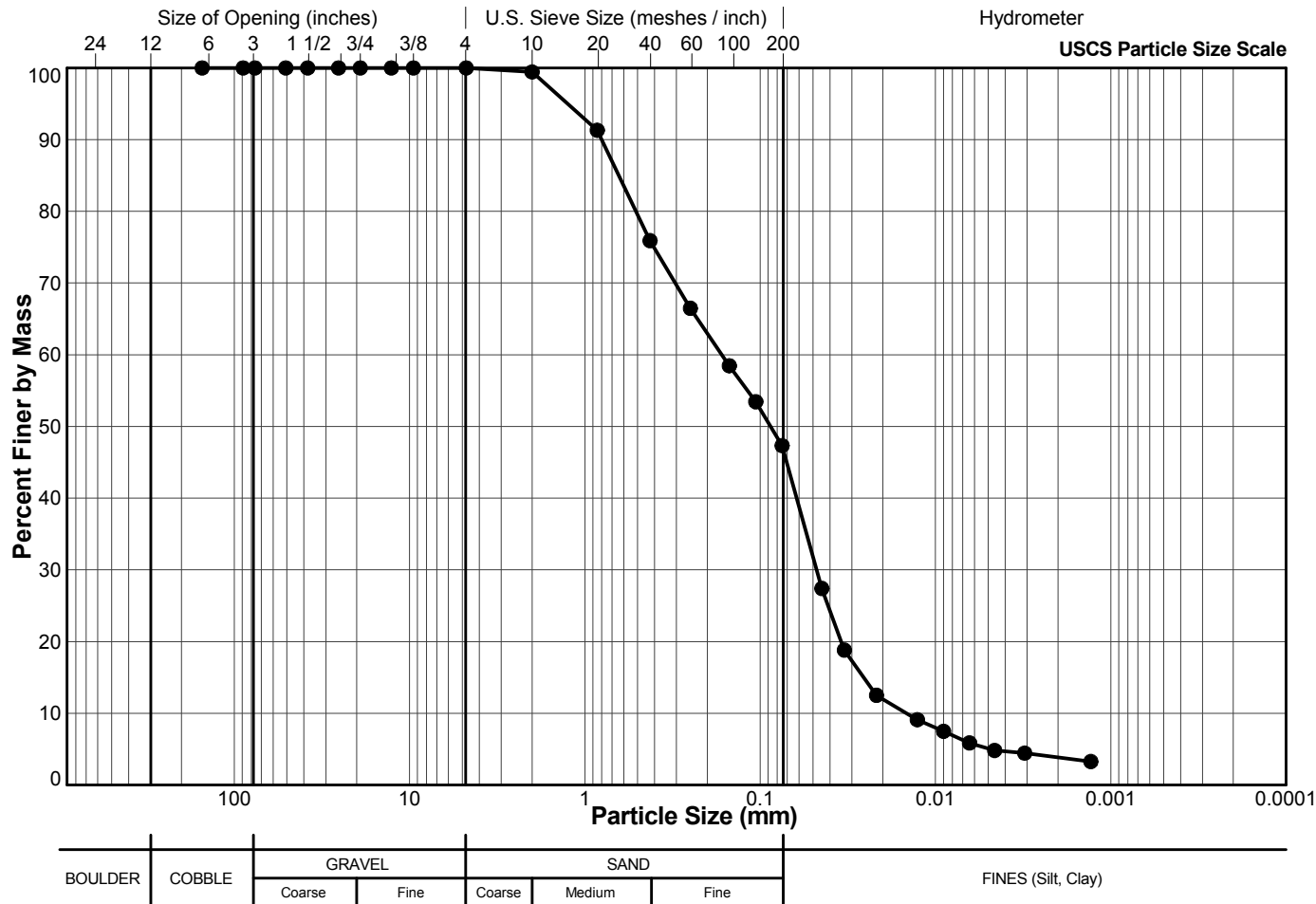
Date

Checked

Date

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: R-4C
Depth (m): N/A
Lab Schedule No.:



Legend

Sieve Size (USS)	Particle Size (mm)	Percent Passing
6"	152.4	100.0
3.5"	88.9	100.0
3"	76.2	100.0
2"	50.8	100.0
1 1/2"	38.1	100.0
1"	25.4	100.0
3/4"	19.1	100.0
1/2"	12.7	100.0
3/8"	9.5	100.0
#4 US MESH	4.75	100.0
#10 US MESH	2	99.4
#20 US MESH	0.85	91.3
#40 US MESH	0.425	75.9
#60 US MESH	0.25	66.5
#100 US MESH	0.15	58.5
#140 US MESH	0.106	53.5
#200 US MESH	0.075	47.3
	0.0445	27.4
	0.0331	18.8
	0.0217	12.5
	0.0127	9.1
	0.0090	7.5
	0.0064	5.9
	0.0046	4.8
	0.0031	4.4
	0.0013	3.3

LH/OA
11/9/2016
LH
11/15/2016

Tech

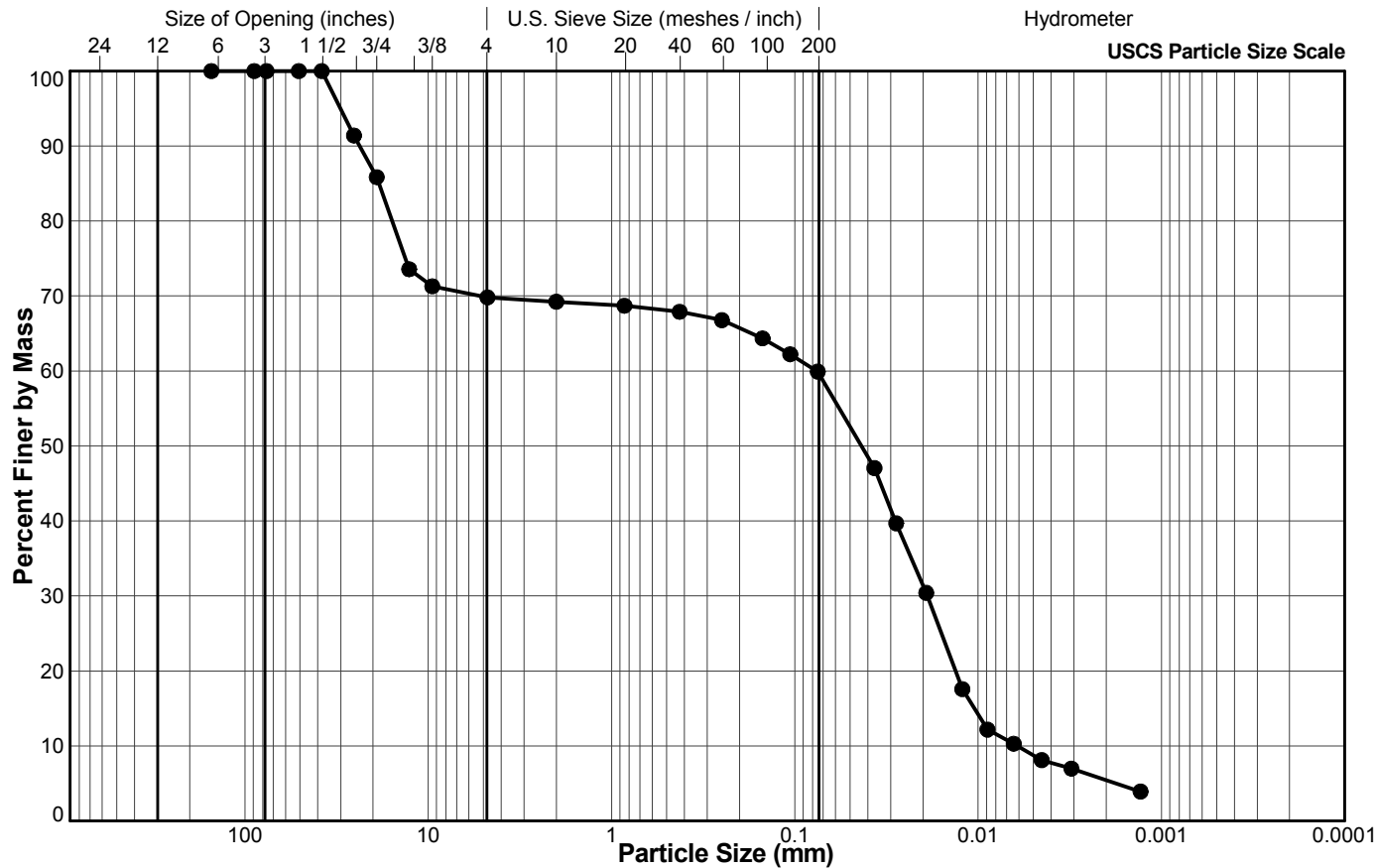
Date

Checked

Date

Client: ALS
Project: L1829679 - LaBerge
Location: Clinton Creek, Yukon
Project No.: 1667729 **Phase:** 1000

Sample Location: LaBerge
Sample No.: R-6A
Depth (m): N/A
Lab Schedule No.:



MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-1A
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	35.8
Ash Content %	97.5
Organic Matter %	2.5

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-1B
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	22.0
Ash Content %	97.6
Organic Matter %	2.4

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-1C
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	22.1
Ash Content %	98.4
Organic Matter %	1.6

Note: percentages are based on oven-dried soil mass

* The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-2A
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	27.5
Ash Content %	98.5
Organic Matter %	1.5

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-2B
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	32.0
Ash Content %	97.6
Organic Matter %	2.4

Note: percentages are based on oven-dried soil mass

* The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

Golder Associates Ltd

#300 - 3811 North Fraser Way Burnaby, British Columbia Canada V5J 5J2
Tel: (604) 412 6899 Fax: (604) 412 6812 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-2C
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	29.8
Ash Content %	97.8
Organic Matter %	2.2

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-3A
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	30.3
Ash Content %	96.7
Organic Matter %	3.3

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-3B
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	27.0
Ash Content %	97.2
Organic Matter %	2.8

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-3C
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Method:	Method A	Other Remarks:
Oven Temperature	110±5°C	
Furnace Temperature	440±22°C	

Moisture Content %	26.7
Ash Content %	97.3
Organic Matter %	2.7

Note: Moisture content as a percentage of oven-dried mass

* The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.

OA/LH	November 8, 2016	NAME	DATE
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-4A
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	25.8
Ash Content %	97.8
Organic Matter %	2.2

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-4B
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	30.7
Ash Content %	96.4
Organic Matter %	3.6

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-4C
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	29.7
Ash Content %	96.3
Organic Matter %	3.7

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-8A
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	10.0
Ash Content %	99.4
Organic Matter %	0.6

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-8B
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	5.6
Ash Content %	99.6
Organic Matter %	0.4

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-8C
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	6.5
Ash Content %	99.5
Organic Matter %	0.5

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: PORCUPINE CR-A
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	19.1
Ash Content %	97.9
Organic Matter %	2.1

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client: ALS		Test Pit: -
Project: L1829672 - LaBerge		Sample: PORCUPINE CR-B
Location: Clinton Creek, Yukon		Depth (m): N/A
Project No.: 1667729-1000		Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	24.4
Ash Content %	97.5
Organic Matter %	2.5

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: PORCUPINE CR-C
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	18.1
Ash Content %	98.3
Organic Matter %	1.7

Note: percentages are based on oven-dried soil mass

* The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: R-2A
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	44.7
Ash Content %	94.3
Organic Matter %	5.7

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: R-2B
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	23.1
Ash Content %	97.6
Organic Matter %	2.4

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client: ALS		Test Pit: -
Project: L1829672 - LaBerge		Sample: R-2C
Location: Clinton Creek, Yukon		Depth (m): N/A
Project No.: 1667729-1000		Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	95.5
Ash Content %	83.6
Organic Matter %	16.4

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: R-3C
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	49.9
Ash Content %	91.2
Organic Matter %	8.8

Note: percentages are based on oven-dried soil mass

* The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: R-4A
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	23.6
Ash Content %	97.8
Organic Matter %	2.2

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: R-4C
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	20.2
Ash Content %	97.9
Organic Matter %	2.1

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: R-6A
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	46.1
Ash Content %	92.8
Organic Matter %	7.2

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-6A
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	28.3
Ash Content %	96.7
Organic Matter %	3.3

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-6B
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	27.5
Ash Content %	97.5
Organic Matter %	2.5

Note: percentages are based on oven-dried soil mass

* The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

MOISTURE, ASH, AND ORGANIC MATTER OF ORGANIC SOILS		Reference(s) ASTM D2974
Client:	ALS	Test Pit: -
Project:	L1829672 - LaBerge	Sample: E-6C
Location:	Clinton Creek, Yukon	Depth (m): N/A
Project No.:	1667729-1000	Lab ID No: 440
Preparation Method:	Method A	Other Remarks:
Oven Temperature:	110±5°C	
Furnace Temperature:	440±22°C	

Moisture Content %	28.9
Ash Content %	98.1
Organic Matter %	1.9

Note: percentages are based on oven-dried soil mass

** The test data given herein pertain to the sample provided only. This report constitutes a testing service only.
Interpretation of the data can be provided upon request.*

OA/LH	November 8, 2016	LH	November 12, 2016
TESTED BY	DATE	CHECKED BY	DATE

WATER CONTENT DETERMINATION

Reference(s)
ASTM D 2216

Client: ALS	Project No.: 1667729 Phase: 1000
Project: L1829679 - LaBerge	Lab Schedule No.:
Location: Clinton Creek, Yukon	

Sample Location	Sample No.	Specimen No.	Depth Interval		Water Content (%)
			Depth (m)	Bottom (m)	
LaBerge	E-1A		0.00	0.00	35.8
LaBerge	E-1B		0.00	0.00	22.0
LaBerge	E-1C		0.00	0.00	22.1
LaBerge	E-2A		0.00	0.00	27.5
LaBerge	E-2B		0.00	0.00	32.0
LaBerge	E-2C		0.00	0.00	29.8
LaBerge	E-3A		0.00	0.00	30.3
LaBerge	E-3B		0.00	0.00	27.0
LaBerge	E-3C		0.00	0.00	26.7
LaBerge	E-4A		0.00	0.00	25.8
LaBerge	E-4B		0.00	0.00	30.7
LaBerge	E-4C		0.00	0.00	29.7
LaBerge	E-6A		0.00	0.00	28.3
LaBerge	E-6B		0.00	0.00	27.5
LaBerge	E-6C		0.00	0.00	28.9
LaBerge	E-8A		0.00	0.00	10.0
LaBerge	E-8B		0.00	0.00	5.6
LaBerge	E-8C		0.00	0.00	6.5
LaBerge	PORCUPINE CR-A		0.00	0.00	19.1
LaBerge	PORCUPINE CR-B		0.00	0.00	24.4
LaBerge	PORCUPINE CR-C		0.00	0.00	18.1
LaBerge	R-2A		0.00	0.00	44.7
LaBerge	R-2B		0.00	0.00	23.1
LaBerge	R-2C		0.00	0.00	95.5
LaBerge	R-3C		0.00	0.00	49.9
LaBerge	R-4A		0.00	0.00	23.6
LaBerge	R-4C		0.00	0.00	20.2
LaBerge	R-6A		0.00	0.00	46.1

LH

11/12/2016

Checked

Date

Golder Associates Ltd.

#300 - 3811 North Fraser Way Burnaby, British Columbia, Canada V5J 5J2
Tel: +1 (604) 412 6899 Fax: +1 (604) 412 6816 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America



Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 - 470676

Page 1 of 3

Report To			Report Format / Distribution			Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)																				
Company: Laberge Environmental Services			Select Report Format: ☒ PDF ☒ EXCEL ☐ EDD (DIGITAL)			R ☒ Regular (Standard TAT if received by 3pm)																				
Contact: Bonnie Burns			Quality Control (QC) Report with Report ☐ Yes ☐ No			P ☐ Priority (2-4 business days if received by 3pm)																				
Address: P.O. Box 21072, Whitehorse, YT			☒ Criteria on Report - provide details below if box checked			E ☐ Emergency (1-2 business days if received by 3pm)																				
Phone: 867-668-6838			Select Distribution: ☒ EMAIL ☐ MAIL ☐ FAX			E2 ☐ Same day or weekend emergency if received by 10am - contact ALS for surcharge.																				
Invoice To: Same as Report To ☒ Yes ☐ No			Email 1 or Fax: bonnieburns@northwestel.net			Specify Date Required for E2, E or P:																				
Copy of Invoice with Report ☒ Yes ☐ No			Email 2:			Analysis Request																				
Company: Laberge Environmental Services			Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																				
Contact: Bonnie Burns			Email 1 or Fax: bonnieburns@northwestel.net			Metals, incl Hg LOI asbestos particle size analysis L1829672-COFC Number of Containers																				
Project Information			Oil and Gas Required Fields (client use)																							
ALS Quote #: 141612DN			Approver ID:																							
Job #: Clinton Creek			GL Account:																							
PO / AFE:			Routing Code:																							
LSD:			Activity Code:																							
Location:			ALS Contact:																							
ALS Lab Work Order # (lab use only) 11829672			Sampler:																							
ALS Sample # (lab use only)			Sample Identification and/or Coordinates (This description will appear on the report)															Date (dd-mmm-yy)			Time (hh:mm)			Sample Type		
E-1A			6/9/16															Soil			✓			✓		
E-1B			6/9/16			"			✓			✓														
E-1C			6/9/16			"			✓			✓														
E-2A			6/9/16			"			✓			✓														
E-2B			6/9/16			"			✓			✓														
E-2C			8/9/16			"			✓			✓														
E-3A			6/9/16			"			✓			✓														
E-3B			6/9/16			"			✓			✓														
E-3C			6/9/16			"			✓			✓														
E-4A			5/9/16			"			✓			✓														
E-4B			5/9/16			"			✓			✓														
E-4C			5/9/16			"			✓			✓														
Drinking Water (DW) Samples (client use)			Special Instructions / Specify Criteria to add on report (client Use)									SAMPLE CONDITION AS RECEIVED (lab use only)														
Are samples taken from a Regulated DW System? ☐ Yes ☐ No			to meet CCHME freshwater aquatic life guidelines									Frozen ☐ SIF Observations Yes ☐ No ☐														
Are samples for human drinking water use? ☐ Yes ☐ No												Ice packs Yes ☒ No ☐ Custody seal intact Yes ☐ No ☐														
SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)									Cooling Initiated ☒														
Released by: Bonnie Burns Date: Sept 12/16 Time:			Received by: EHE Date: 12/30/16 Time: 10:09									INITIAL COOLER TEMPERATURES °C: 7.0 MP FINAL COOLER TEMPERATURES °C:														
FINAL SHIPMENT RECEPTION (lab use only)			Received by: Rm Date: 9/16/16 Time: 8:30 AM																							

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-EM-0126a v09 EcotERM January 2011

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

Report To Company: <u>Laberge Env. Services</u> Contact: <u>Bonnie Burns</u> Address: <u>PO Box 21072, Whitehorse, YT</u> Phone: <u>867-668-6838</u>		Report Format / Distribution Select Report Format: ☒ PDF ☒ EXCEL ☐ EDD (DIGITAL) Quality Control (QC) Report with Report ☒ Yes ☐ No Criteria on Report - provide details below if box checked Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX Email 1 or Fax: <u>bonnieburns@northwest.net</u> Email 2: _____		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests) R ☒ Regular (Standard TAT if received by 3pm) P ☐ Priority (2-4 business days if received by 3pm) E ☐ Emergency (1-2 business days if received by 3pm) E2 ☐ Same day or weekend emergency if received by 10am - contact ALS for surcharge. Specify Date Required for E2, E or P: _____																																																																																																																						
Invoice To Same as Report To ☒ Yes ☐ No Copy of Invoice with Report ☒ Yes ☐ No Company: <u>Laberge Env. Serv.</u> Contact: <u>Bonnie Burns</u> Project Information ALS Quote #: <u>141612-DN</u> Job #: <u>Clinton Creek</u> PO / AFE: _____ LSD: _____		Invoice Distribution Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX Email 1 or Fax: _____ Email 2: _____ Oil and Gas Required Fields (client use) Approver ID: _____ Cost Center: _____ GL Account: _____ Routing Code: _____ Activity Code: _____ Location: _____ ALS Contact: _____ Sampler: _____		Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Sample ID</th> <th>Filtered (F)</th> <th>Preserved (P)</th> <th>Filtered and Preserved (F/P)</th> <th>Number of Containers</th> </tr> </thead> <tbody> <tr><td>E-8A</td><td></td><td></td><td></td><td></td></tr> <tr><td>E-8B</td><td></td><td></td><td></td><td></td></tr> <tr><td>E-8C</td><td></td><td></td><td></td><td></td></tr> <tr><td>Porcupine Cr - A</td><td></td><td></td><td></td><td></td></tr> <tr><td>Porcupine Cr - B</td><td></td><td></td><td></td><td></td></tr> <tr><td>Porcupine Cr - C</td><td></td><td></td><td></td><td></td></tr> <tr><td>R-1A</td><td></td><td></td><td></td><td></td></tr> <tr><td>R-1B</td><td></td><td></td><td></td><td></td></tr> <tr><td>R-1C</td><td></td><td></td><td></td><td></td></tr> <tr><td>R-2A</td><td></td><td></td><td></td><td></td></tr> <tr><td>R-2B</td><td></td><td></td><td></td><td></td></tr> <tr><td>R-2C</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>		Sample ID	Filtered (F)	Preserved (P)	Filtered and Preserved (F/P)	Number of Containers	E-8A					E-8B					E-8C					Porcupine Cr - A					Porcupine Cr - B					Porcupine Cr - C					R-1A					R-1B					R-1C					R-2A					R-2B					R-2C																																																								
Sample ID	Filtered (F)	Preserved (P)	Filtered and Preserved (F/P)	Number of Containers																																																																																																																						
E-8A																																																																																																																										
E-8B																																																																																																																										
E-8C																																																																																																																										
Porcupine Cr - A																																																																																																																										
Porcupine Cr - B																																																																																																																										
Porcupine Cr - C																																																																																																																										
R-1A																																																																																																																										
R-1B																																																																																																																										
R-1C																																																																																																																										
R-2A																																																																																																																										
R-2B																																																																																																																										
R-2C																																																																																																																										
ALS Lab Work Order # (lab use only) _____		<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>ALS Sample # (lab use only)</th> <th>Sample Identification and/or Coordinates (This description will appear on the report)</th> <th>Date (dd-mmm-yy)</th> <th>Time (hh:mm)</th> <th>Sample Type</th> <th>Metals incl Hg</th> <th>LOI</th> <th>Asbestos</th> <th>Particle Size Analysis</th> </tr> </thead> <tbody> <tr><td></td><td>E-8A</td><td>8/9/16</td><td></td><td>Soil</td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td>E-8B</td><td>8/9/16</td><td></td><td>"</td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td>E-8C</td><td>8/9/16</td><td></td><td>"</td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td>Porcupine Cr - A</td><td>7/9/16</td><td></td><td>"</td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td>Porcupine Cr - B</td><td>7/9/16</td><td></td><td>"</td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td>Porcupine Cr - C</td><td>7/9/16</td><td></td><td>"</td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td>R-1A</td><td>7/9/16</td><td></td><td>"</td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td>R-1B</td><td>7/9/16</td><td></td><td>"</td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td>R-1C</td><td>7/9/16</td><td></td><td>"</td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td>R-2A</td><td>7/9/16</td><td></td><td>"</td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td>R-2B</td><td>7/9/16</td><td></td><td>"</td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td>R-2C</td><td>7/9/16</td><td></td><td>"</td><td></td><td></td><td></td><td></td></tr> </tbody> </table>				ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Metals incl Hg	LOI	Asbestos	Particle Size Analysis		E-8A	8/9/16		Soil						E-8B	8/9/16		"						E-8C	8/9/16		"						Porcupine Cr - A	7/9/16		"						Porcupine Cr - B	7/9/16		"						Porcupine Cr - C	7/9/16		"						R-1A	7/9/16		"						R-1B	7/9/16		"						R-1C	7/9/16		"						R-2A	7/9/16		"						R-2B	7/9/16		"						R-2C	7/9/16		"				
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Metals incl Hg	LOI	Asbestos	Particle Size Analysis																																																																																																																		
	E-8A	8/9/16		Soil																																																																																																																						
	E-8B	8/9/16		"																																																																																																																						
	E-8C	8/9/16		"																																																																																																																						
	Porcupine Cr - A	7/9/16		"																																																																																																																						
	Porcupine Cr - B	7/9/16		"																																																																																																																						
	Porcupine Cr - C	7/9/16		"																																																																																																																						
	R-1A	7/9/16		"																																																																																																																						
	R-1B	7/9/16		"																																																																																																																						
	R-1C	7/9/16		"																																																																																																																						
	R-2A	7/9/16		"																																																																																																																						
	R-2B	7/9/16		"																																																																																																																						
	R-2C	7/9/16		"																																																																																																																						
Drinking Water (DW) Samples (client use) Are samples taken from a Regulated DW System? ☐ Yes ☐ No Are samples for human drinking water use? ☐ Yes ☐ No		Special Instructions / Specify Criteria to add on report (client Use) _____		SAMPLE CONDITION AS RECEIVED (lab use only) Frozen ☐ SIF Observations Yes ☐ No ☐ Ice packs Yes ☒ No ☐ Custody seal intact Yes ☐ No ☐ Cooling Initiated ☒																																																																																																																						
SHIPMENT RELEASE (client use) Released by: _____ Date: _____ Time: _____		INITIAL SHIPMENT RECEPTION (lab use only) Received by: <u>EHF</u> Date: <u>2016 12 SEP</u> Time: <u>10:09</u>		FINAL SHIPMENT RECEPTION (lab use only) Received by: _____ Date: _____ Time: _____																																																																																																																						

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.
 1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

WHITE - LABORATORY COPY YELLOW - CLIENT COPY



Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical
Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 - 470939

Page 3 of 3

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)	
Company: Same as 1		Select Report Format: ☒ PDF ☒ EXCEL ☐ EDD (DIGITAL)		R ☒ Regular (Standard TAT if received by 3pm)	
Contact: PG		Quality Control (QC) Report with Report ☒ Yes ☐ No		P ☐ Priority (2-4 business days if received by 3pm)	
Address:		☒ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 business days if received by 3pm)	
Phone:		Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX		E2 ☐ Same day or weekend emergency if received by 10am - contact ALS for surcharge.	
		Email 1 or Fax		Specify Date Required for E2, E or P:	
		Email 2			
Invoice To		Invoice Distribution		Analysis Request	
Same as Report To ☐ Yes ☐ No		Select Invoice Distribution: ☒ EMAIL ☐ MAIL ☐ FAX		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below	
Copy of Invoice with Report ☐ Yes ☐ No		Email 1 or Fax			
Contact:		Email 2			
Project Information		Oil and Gas Required Fields (client use)			
ALS Quote #: Same		Approver ID:			
Job #: PG		Cost Center:			
PO / AFE:		GL Account:			
LSD:		Routing Code:			
		Activity Code:			
		Location:			
ALS Lab Work Order # (lab use only)		ALS Contact:		Sampler:	
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	Number of Containers
	R-3A	6/9/16		Soil	2
	R-3B	6/9/16		"	2
	R-3C	6/9/16		"	2
	R-4A	5/9/16		"	2
	R-4B	5/9/16		"	2
	R-4C	5/9/16		"	2
	R-6A	8/9/16		"	2
	R-6B	8/9/16		"	2
	R-6C	8/9/16		"	2
	E-6A	5/9/16		"	2
	E-6B	5/9/16		"	2
	E-6C	5/9/16		"	2
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report (client use)		SAMPLE CONDITION AS RECEIVED (lab use only)	
Are samples taken from a Regulated DW System? ☐ Yes ☐ No		to meet CME Freshwater aquatic life guidelines		Frozen ☐ SIF Observations Yes ☐ No ☐	
Are samples for human drinking water use? ☐ Yes ☐ No				Ice packs Yes ☒ No ☐ Custody seal intact Yes ☐ No ☐	
				Cooling Initiated ☒	
				INITIAL COOLER TEMPERATURES °C: 7.0 / 10.0	
				FINAL COOLER TEMPERATURES °C:	
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)		FINAL SHIPMENT RECEPTION (lab use only)	
Released by:	Date:	Time:	Received by: EHF	Date: 2016 12 SEP	Time: 10:09

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0320e v09 Fract04 January 2014

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

APPENDIX D
PERIPHYTON DATA, 2016

EPILITHIC ALGAL BIOMASS (ug/g) AND EPILITHIC ALGAL DENSITY (cells/cm2) FOR THE PERIPHYTON SAMPLES, 2016									
Location	Date	Cyanophyta		Chlorophyta		Bacillariophyta		Rhodophyta	
		µg/cm ²	cells/cm ²	µg/cm ²	cells/cm ²	µg/cm ²	cells/cm ²	µg/cm ²	cells/cm ²
E1	6/Sep/16	8.18	157,192	0.00	0	368.88	424,203	101.00	116,279
E2	6/Sep/16	3.10	66,753	0.00	0	468.71	497,416	263.67	249,785
E3	6/Sep/16	28.05	399,081	0.00	0	28.46	97,617	6.35	7,178
E4	5/Sep/16	20.39	257,321	0.00	0	196.13	144,272	23.90	26,916
E6	5/Sep/16	3.11	57,996	0.00	0	9.43	27,275	0.00	0
E8	8/Sep/16	3.21	58,968	0.00	0	24.71	33,459	2.20	3,975
PORCUPINE CR	7/Sep/16	8.65	7,178	4.47	2,871	172.20	304,335	26.84	25,840
R2	7/Sep/16	6.34	6,568	0.00	0	2.89	7,752	5.48	11,090
R3	6/Sep/16	37.13	407,695	0.00	0	6.16	24,404	6.22	14,355
R4	5/Sep/16	0.87	18,863	0.00	0	0.69	3,273	0.00	0
R6	8/Sep/16	0.67	18,088	0.00	0	29.87	157,623	0.00	0

R= QA/QC recount

E3R	6/Sep/16	26.31	377,548	0.00	0	31.96	97,617	13.97	15,791
-----	----------	-------	---------	------	---	-------	--------	-------	--------

2016 Epilithic algal species data, Clinton Creek

samples sorted by location

** 1st number in species code = group 1=cyanophyte 2=chlorophyte 5=diatoms 6=Red Algae

** total daily biomass is sum of all species on a date

Location	Date	Species code	Speceis name	density cells/cm ²	biomass µg/cm ²	length µ	width µ	cell volume µ ³
E1	5-Sep-16	1084	Gloeocapsa punctata	21533	1.10	4.60	4.60	51.00
E1	5-Sep-16	1131	Heteroleibeinia profunda Komarek	101206	6.23	19.60	2.00	61.60
E1	5-Sep-16	1223	Chamaesiphon incrustans Smith	34453	0.84	5.20	3.00	24.50
E1	5-Sep-16	5311	Cymbella minuta Kutzing	2153	0.70	16.00	7.20	325.70
E1	5-Sep-16	5523	Synedra ulna (Nitzsch) Ehrenberg	58140	304.42	200.00	10.00	5236.00
E1	5-Sep-16	5702	Achnanthes minutissima Kutzing	271318	18.29	16.10	4.00	67.40
E1	5-Sep-16	5836	Encyonema silesiacum (Bleisch) D.G. Mann	8613	10.15	30.00	10.00	1178.10
E1	5-Sep-16	5860	Diatoma vulgare Bory	32300	8.83	29.00	6.00	273.30
E1	5-Sep-16	5871	Cymbella lapponica	2153	2.48	44.00	10.00	1151.90
E1	5-Sep-16	5873	Gomphonema minutum	40913	18.92	27.60	8.00	462.40
E1	5-Sep-16	5875	Cocconies disculus Schum.	2153	3.09	28.00	14.00	1436.80
E1	5-Sep-16	5882	Anomoenies vitrea Ross	6460	2.01	33.00	6.00	311.00
E1	5-Sep-16	8001	Audouinella / Chantransia stage. Red alga	116279	101.00	32.00	7.20	868.60
E2	5-Sep-16	1131	Heteroleibeinia profunda Komarek	34453	2.30	21.30	2.00	66.90
E2	5-Sep-16	1223	Chamaesiphon incrustans Smith	32300	0.79	5.20	3.00	24.50
E2	5-Sep-16	5523	Synedra ulna (Nitzsch) Ehrenberg	68906	378.83	210.00	10.00	5497.80
E2	5-Sep-16	5702	Achnanthes minutissima Kutzing	219638	14.72	16.00	4.00	67.00
E2	5-Sep-16	5821	Eunotia exigua (Brebisson) Grunow	2153	0.59	29.00	6.00	273.30
E2	5-Sep-16	5836	Encyonema silesiacum (Bleisch) D.G. Mann	8613	10.15	30.00	10.00	1178.10
E2	5-Sep-16	5860	Diatoma vulgare Bory	139966	36.01	27.30	6.00	257.30
E2	5-Sep-16	5871	Cymbella lapponica	2153	2.31	41.00	10.00	1073.40
E2	5-Sep-16	5873	Gomphonema minutum	34453	15.53	26.90	8.00	450.70
E2	5-Sep-16	5875	Cocconies disculus Schum.	2153	3.01	27.20	14.00	1395.70
E2	5-Sep-16	5882	Anomoenies vitrea Ross	2153	0.69	34.00	6.00	320.40
E2	5-Sep-16	5916	Fragilaria capucina Grunow	15073	2.46	39.00	4.00	163.40
E2	5-Sep-16	5986	Meridion circulare Agardh	2153	4.42	40.00	14.00	2052.50
E2	5-Sep-16	8001	Audouinella / Chantransia stage. Red alga	249785	263.67	31.50	8.00	1055.60
E3	5-Sep-16	1131	Heteroleibeinia profunda Komarek	275624	24.45	25.60	2.10	88.70
E3	5-Sep-16	1223	Chamaesiphon incrustans Smith	123457	3.60	6.20	3.00	29.20
E3	5-Sep-16	5311	Cymbella minuta Kutzing	1436	0.52	14.30	8.00	359.40
E3	5-Sep-16	5523	Synedra ulna (Nitzsch) Ehrenberg	2871	15.03	200.00	10.00	5236.00
E3	5-Sep-16	5702	Achnanthes minutissima Kutzing	67471	4.78	16.90	4.00	70.80
E3	5-Sep-16	5836	Encyonema silesiacum (Bleisch) D.G. Mann	1436	1.69	30.00	10.00	1178.10
E3	5-Sep-16	5860	Diatoma vulgare Bory	17227	4.04	24.90	6.00	234.70
E3	5-Sep-16	5873	Gomphonema minutum	4307	1.90	26.40	8.00	442.30
E3	5-Sep-16	5916	Fragilaria capucina Grunow	2871	0.49	41.00	4.00	171.70
E3	5-Sep-16	8001	Audouinella / Chantransia stage. Red alga	7178	6.35	26.40	8.00	884.70
E3R	5-Sep-16	1131	Heteroleibeinia profunda Komarek	256962	22.79	25.60	2.10	88.70
E3R	5-Sep-16	1223	Chamaesiphon incrustans Smith	120586	3.52	6.20	3.00	29.20
E3R	5-Sep-16	5311	Cymbella minuta Kutzing	4307	1.55	14.30	8.00	359.40
E3R	5-Sep-16	5523	Synedra ulna (Nitzsch) Ehrenberg	2871	15.03	200.00	10.00	5236.00
E3R	5-Sep-16	5702	Achnanthes minutissima Kutzing	58857	4.17	16.90	4.00	70.80
E3R	5-Sep-16	5836	Encyonema silesiacum (Bleisch) D.G. Mann	1436	1.69	30.00	10.00	1178.10
E3R	5-Sep-16	5860	Diatoma vulgare Bory	20098	4.72	24.90	6.00	234.70
E3R	5-Sep-16	5871	Cymbella lapponica	1436	1.54	41.00	10.00	1073.40
E3R	5-Sep-16	5873	Gomphonema minutum	5742	2.54	26.40	8.00	442.30
E3R	5-Sep-16	5882	Anomoenies vitrea Ross	1436	0.48	35.30	6.00	332.70
E3R	5-Sep-16	5916	Fragilaria capucina Grunow	1436	0.25	41.00	4.00	171.70
E3R	5-Sep-16	8001	Audouinella / Chantransia stage. Red alga	15791	13.97	26.40	8.00	884.70
E4	5-Sep-16	1067	Cylindrospermum sp.	3230	0.38	46.00	2.20	116.60
E4	5-Sep-16	1131	Heteroleibeinia profunda Komarek	185185	18.04	31.00	2.00	97.40
E4	5-Sep-16	1223	Chamaesiphon incrustans Smith	68906	1.98	6.10	3.00	28.70
E4	5-Sep-16	5311	Cymbella minuta Kutzing	1077	0.40	14.90	8.00	374.50
E4	5-Sep-16	5523	Synedra ulna (Nitzsch) Ehrenberg	34453	180.40	200.00	10.00	5236.00
E4	5-Sep-16	5702	Achnanthes minutissima Kutzing	64599	4.14	15.30	4.00	64.10
E4	5-Sep-16	5781	Eunotia sp.	1077	0.19	24.00	5.30	176.50
E4	5-Sep-16	5860	Diatoma vulgare Bory	34453	8.51	26.20	6.00	246.90
E4	5-Sep-16	5873	Gomphonema minutum	3230	1.41	26.00	8.00	435.60
E4	5-Sep-16	5882	Anomoenies vitrea Ross	1077	0.34	34.00	6.00	320.40
E4	5-Sep-16	5916	Fragilaria capucina Grunow	4307	0.74	41.00	4.00	171.70
E4	5-Sep-16	8001	Audouinella / Chantransia stage. Red alga	26916	23.90	26.50	8.00	888.00
E6	5-Sep-16	1131	Heteroleibeinia profunda Komarek	35314	2.51	22.60	2.00	71.00
E6	5-Sep-16	1223	Chamaesiphon incrustans Smith	22682	0.60	5.60	3.00	26.40
E6	5-Sep-16	5306	Navicula minima Grunow	287	0.02	12.00	5.00	78.50
E6	5-Sep-16	5523	Synedra ulna (Nitzsch) Ehrenberg	574	3.53	235.00	10.00	6152.30
E6	5-Sep-16	5702	Achnanthes minutissima Kutzing	10910	0.73	16.00	4.00	67.00
E6	5-Sep-16	5860	Diatoma vulgare Bory	4020	1.03	27.10	6.00	255.40
E6	5-Sep-16	5873	Gomphonema minutum	8039	3.49	25.90	8.00	434.00
E6	5-Sep-16	5882	Anomoenies vitrea Ross	574	0.19	36.00	6.00	339.30
E6	5-Sep-16	5916	Fragilaria capucina Grunow	2871	0.43	36.00	4.00	150.80
E8	5-Sep-16	1084	Gloeocapsa punctata	3313	0.13	4.20	4.20	38.80
E8	5-Sep-16	1131	Heteroleibeinia profunda Komarek	21533	2.10	31.00	2.00	97.40

2016 Epilithic algal species data, Clinton Creek

samples sorted by location

** 1st number in species code = group 1=cyanophyte 2=chlorophyte 5=diatoms 6=Red Algae

** total daily biomass is sum of all species on a date

Location	Date	Species code	Speceis name	density cells/cm ²	biomass µg/cm ²	length µ	width µ	cell volume µ ³
E8	5-Sep-16	1223	Chamaesiphon incrustans Smith	34122	0.98	6.10	3.00	28.70
E8	5-Sep-16	5311	Cymbella minuta Kutzing	1656	0.67	16.00	8.00	402.10
E8	5-Sep-16	5460	Gomphonema truncatum Ehrenberg	331	0.40	46.00	10.00	1204.30
E8	5-Sep-16	5516	Fragilaria construens (Ehrenberg) Grunow	1325	0.10	18.00	4.00	75.40
E8	5-Sep-16	5523	Synedra ulna (Nitzsch) Ehrenberg	663	3.64	210.00	10.00	5497.80
E8	5-Sep-16	5702	Achnanthes minutissima Kutzing	17558	1.19	16.20	4.00	67.90
E8	5-Sep-16	5836	Encyonema silesiacum (Bleisch) D.G. Mann	1656	1.82	28.00	10.00	1099.60
E8	5-Sep-16	5860	Diatoma vulgare Bory	4638	1.09	25.00	6.00	235.60
E8	5-Sep-16	5870	Navicula radiosa Kutzing	331	0.62	72.00	10.00	1885.00
E8	5-Sep-16	5873	Gomphonema minutum	3975	1.73	26.00	8.00	435.60
E8	5-Sep-16	5880	Didymosphenia geminata Schmidt	331	13.26	118.00	36.00	40036.50
E8	5-Sep-16	5916	Fragilaria capucina Grunow	994	0.18	42.60	4.00	178.40
E8	5-Sep-16	8001	Audouinella / Chantransia stage. Red alga	3975	2.20	29.30	6.00	552.30
Porcupine Cr	5-Sep-16	1122	Phormidium autumnale Agardh	2871	8.20	101.00	6.00	2855.70
Porcupine Cr	5-Sep-16	1131	Heteroleibeinia profunda Komarek	4307	0.45	33.00	2.00	103.70
Porcupine Cr	5-Sep-16	2205	Mougeotia sp.	2871	4.47	31.00	8.00	1558.20
Porcupine Cr	5-Sep-16	5523	Synedra ulna (Nitzsch) Ehrenberg	11484	66.15	220.00	10.00	5759.60
Porcupine Cr	5-Sep-16	5702	Achnanthes minutissima Kutzing	114844	9.10	18.90	4.00	79.20
Porcupine Cr	5-Sep-16	5836	Encyonema silesiacum (Bleisch) D.G. Mann	4307	5.07	30.00	10.00	1178.10
Porcupine Cr	5-Sep-16	5860	Diatoma vulgare Bory	1436	0.38	28.00	6.00	263.90
Porcupine Cr	5-Sep-16	5870	Navicula radiosa Kutzing	1436	2.10	56.00	10.00	1466.10
Porcupine Cr	5-Sep-16	5873	Gomphonema minutum	149297	73.54	29.40	8.00	492.60
Porcupine Cr	5-Sep-16	5881	Diatoma elongatum Agardh	2871	0.49	41.00	4.00	171.70
Porcupine Cr	5-Sep-16	5884	Gomphonema angustum Agardh	11484	13.83	46.00	10.00	1204.30
Porcupine Cr	5-Sep-16	5916	Fragilaria capucina Grunow	7178	1.53	51.00	4.00	213.60
Porcupine Cr	5-Sep-16	8001	Audouinella / Chantransia stage. Red alga	25840	26.84	31.00	8.00	1038.80
R2	5-Sep-16	1122	Phormidium autumnale Agardh	1938	6.08	111.00	6.00	3138.50
R2	5-Sep-16	1131	Heteroleibeinia profunda Komarek	3445	0.23	21.10	2.00	66.30
R2	5-Sep-16	1223	Chamaesiphon incrustans Smith	1184	0.03	6.00	2.60	21.20
R2	5-Sep-16	5311	Cymbella minuta Kutzing	323	0.08	14.00	6.80	254.20
R2	5-Sep-16	5702	Achnanthes minutissima Kutzing	2261	0.15	16.20	4.00	67.90
R2	5-Sep-16	5836	Encyonema silesiacum (Bleisch) D.G. Mann	538	0.63	30.00	10.00	1178.10
R2	5-Sep-16	5860	Diatoma vulgare Bory	754	0.18	25.90	6.00	244.10
R2	5-Sep-16	5870	Navicula radiosa Kutzing	108	0.17	61.00	10.00	1597.00
R2	5-Sep-16	5873	Gomphonema minutum	3445	1.62	28.00	8.00	469.10
R2	5-Sep-16	5916	Fragilaria capucina Grunow	323	0.05	33.30	4.00	139.50
R2	5-Sep-16	8001	Audouinella / Chantransia stage. Red alga	11090	5.48	26.20	6.00	493.90
R3	5-Sep-16	1084	Gloeocapsa punctata	44502	1.73	4.20	4.20	38.80
R3	5-Sep-16	1131	Heteroleibeinia profunda Komarek	312949	33.61	31.00	2.10	107.40
R3	5-Sep-16	1223	Chamaesiphon incrustans Smith	35889	0.95	5.60	3.00	26.40
R3	5-Sep-16	1238	Clastidium cylindricum Whelden	14355	0.84	7.00	4.00	58.60
R3	5-Sep-16	5702	Achnanthes minutissima Kutzing	7178	0.48	16.00	4.00	67.00
R3	5-Sep-16	5821	Eunotia exigua (Brebisson) Grunow	1436	0.40	29.40	6.00	277.10
R3	5-Sep-16	5860	Diatoma vulgare Bory	8613	2.03	25.00	6.00	235.60
R3	5-Sep-16	5873	Gomphonema minutum	7178	3.25	27.00	8.00	452.40
R3	5-Sep-16	8001	Audouinella / Chantransia stage. Red alga	14355	6.22	23.00	6.00	433.50
R4	5-Sep-16	1084	Gloeocapsa punctata	3445	0.12	4.10	4.10	36.10
R4	5-Sep-16	1131	Heteroleibeinia profunda Komarek	8699	0.58	21.10	2.00	66.30
R4	5-Sep-16	1223	Chamaesiphon incrustans Smith	6718	0.17	5.60	2.90	24.70
R4	5-Sep-16	5311	Cymbella minuta Kutzing	172	0.07	15.60	8.00	392.10
R4	5-Sep-16	5702	Achnanthes minutissima Kutzing	1034	0.07	16.00	4.00	67.00
R4	5-Sep-16	5860	Diatoma vulgare Bory	1206	0.27	24.00	6.00	226.20
R4	5-Sep-16	5873	Gomphonema minutum	517	0.23	26.00	8.00	435.60
R4	5-Sep-16	5916	Fragilaria capucina Grunow	345	0.05	36.00	4.00	150.80
R6	5-Sep-16	1084	Gloeocapsa punctata	13781	0.50	4.10	4.10	36.10
R6	5-Sep-16	1131	Heteroleibeinia profunda Komarek	1723	0.10	19.00	2.00	59.70
R6	5-Sep-16	1223	Chamaesiphon incrustans Smith	2584	0.07	5.50	3.00	25.90
R6	5-Sep-16	5311	Cymbella minuta Kutzing	4307	1.27	15.30	7.00	294.40
R6	5-Sep-16	5702	Achnanthes minutissima Kutzing	121447	9.46	18.60	4.00	77.90
R6	5-Sep-16	5836	Encyonema silesiacum (Bleisch) D.G. Mann	4307	5.07	30.00	10.00	1178.10
R6	5-Sep-16	5871	Cymbella lapponica	861	0.97	43.00	10.00	1125.70
R6	5-Sep-16	5873	Gomphonema minutum	3445	1.67	29.00	8.00	485.90
R6	5-Sep-16	5884	Gomphonema angustum Agardh	861	0.92	41.00	10.00	1073.40
R6	5-Sep-16	5901	Denticula sp	861	0.15	18.00	6.00	169.60
R6	5-Sep-16	5916	Fragilaria capucina Grunow	21533	10.35	51.00	6.00	480.70



LABERGE ENVIRONMENTAL
ATTN: Bonnie Burns
PO Box 21072
Whitehorse YT Y1A 6P7

Date Received: 12-SEP-16
Report Date: 29-SEP-16 11:58 (MT)
Version: FINAL

Client Phone: 867-668-6838

Certificate of Analysis

Lab Work Order #: L1829615
Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: 14-470932, 14-470930
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1829615-1	L1829615-2	L1829615-3	L1829615-4	L1829615-5
		Description	Water	Water	Water	Water	Water
		Sampled Date	06-SEP-16	07-SEP-16	06-SEP-16	06-SEP-16	05-SEP-16
		Sampled Time	14:30	09:40	16:30	09:00	13:10
		Client ID	E-1	PORCUPINE CR	E-2	E-3	E-4
Grouping	Analyte						
BIOTA							
Plant Pigments	Chlorophyll a (ug)	70.6	37.4	87.0	26.4	31.9	
	Pheophytin a (ug)	56.0	31.7	75.1	19.6	27.5	

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	Description	Sampled Date	Sampled Time	Client ID
		L1829615-6	Water	05-SEP-16	09:30	E-6
		L1829615-7	Water	08-SEP-16	14:50	E-8
		L1829615-9	Water	07-SEP-16	15:00	R-2
		L1829615-10	Water	06-SEP-16	11:30	R-3
		L1829615-11	Water	05-SEP-16	11:40	R-4
Grouping	Analyte					
BIOTA						
Plant Pigments	Chlorophyll a (ug)	24.1	11.3	16.5	22.0	0.126
	Pheophytin a (ug)	20.7	10.3	14.6	17.3	0.109

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L1829615-1 Water 06-SEP-16 14:30 E-1	L1829615-2 Water 07-SEP-16 09:40 PORCUPINE CR	L1829615-3 Water 06-SEP-16 16:30 E-2	L1829615-4 Water 06-SEP-16 09:00 E-3	L1829615-5 Water 05-SEP-16 13:10 E-4
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		531	1980	664	622	708
	Hardness (as CaCO3) (mg/L)		281	1370	370	337	386
	pH (pH)		8.20	8.38	8.11	8.15	8.14
Anions and Nutrients	Sulfate (SO4) (mg/L)		151	1090	219	191	236
Total Metals	Aluminum (Al)-Total (mg/L)		0.0656	0.0051	0.0516	1.23	0.185
	Antimony (Sb)-Total (mg/L)		<0.00050	0.00148	<0.00050	0.00066	<0.00050
	Arsenic (As)-Total (mg/L)		0.00090	0.00239	0.00109	0.00198	0.00135
	Barium (Ba)-Total (mg/L)		0.071	0.026	0.066	0.107	0.067
	Beryllium (Be)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Total (mg/L)		<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Total (mg/L)		<0.10	0.23	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)		0.0000453	0.000162	0.0000474	0.000186	0.0000621
	Calcium (Ca)-Total (mg/L)		68.1	187	78.3	65.0	76.0
	Chromium (Cr)-Total (mg/L)		<0.0010	0.0024	<0.0010	0.0032	0.0011
	Cobalt (Co)-Total (mg/L)		0.00049	<0.00030	0.00064	0.00164	0.00085
	Copper (Cu)-Total (mg/L)		0.0030	0.0020	0.0026	0.0062	0.0028
	Iron (Fe)-Total (mg/L)		0.323	<0.030	0.349	2.67	0.645
	Lead (Pb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	0.00141	<0.00050
	Lithium (Li)-Total (mg/L)		0.0028	0.0645	0.0074	0.0045	0.0095
	Magnesium (Mg)-Total (mg/L)		28.0	209	42.9	42.0	46.2
	Manganese (Mn)-Total (mg/L)		0.182	0.00134	0.166	0.226	0.193
	Mercury (Hg)-Total (mg/L)		0.0000057	0.0000051	0.0000062	0.0000189	0.0000068
	Molybdenum (Mo)-Total (mg/L)		0.0013	0.0026	0.0015	0.0017	0.0016
	Nickel (Ni)-Total (mg/L)		0.0046	0.0573	0.0110	0.0093	0.0134
	Phosphorus (P)-Total (mg/L)		<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)		<2.0	2.6	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)		0.00188	0.00501	0.00194	0.00167	0.00179
	Silicon (Si)-Total (mg/L)		5.13	6.10	5.05	7.74	5.26
	Silver (Ag)-Total (mg/L)		<0.000020	<0.000020	<0.000020	0.000053	<0.000020
	Sodium (Na)-Total (mg/L)		2.9	13.7	3.7	4.9	4.2
	Strontium (Sr)-Total (mg/L)		0.304	1.62	0.418	0.327	0.426
	Thallium (Tl)-Total (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)		<0.010	<0.010	<0.010	0.030	<0.010
	Uranium (U)-Total (mg/L)		0.00185	0.00530	0.00207	0.00248	0.00223
	Vanadium (V)-Total (mg/L)		0.00069	<0.00050	0.00067	0.00430	0.00105
	Zinc (Zn)-Total (mg/L)		<0.0050	0.0067	<0.0050	0.0147	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

29-SEP-16 11:58 (MT)

Version: FINAL

Sample ID Description Sampled Date Sampled Time Client ID		L1829615-6 Water 05-SEP-16 09:30 E-6	L1829615-7 Water 08-SEP-16 14:50 E-8	L1829615-8 Water 07-SEP-16 12:45 R-1	L1829615-9 Water 07-SEP-16 15:00 R-2	L1829615-10 Water 06-SEP-16 11:30 R-3
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	716	250	700	618	682
	Hardness (as CaCO3) (mg/L)	385	116	375	328	367
	pH (pH)	8.20	8.06	8.21	8.25	8.17
Anions and Nutrients	Sulfate (SO4) (mg/L)	235	47.9	224	169	218
Total Metals	Aluminum (Al)-Total (mg/L)	0.549	0.281	0.819	0.316	0.345
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00195	0.00079	0.00148	0.00132	0.00101
	Barium (Ba)-Total (mg/L)	0.089	0.048	0.081	0.062	0.080
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Total (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	0.000104	0.0000339	0.000174	0.0000351	0.0000320
	Calcium (Ca)-Total (mg/L)	78.0	31.2	93.6	61.9	71.2
	Chromium (Cr)-Total (mg/L)	0.0023	<0.0010	0.0018	0.0013	0.0013
	Cobalt (Co)-Total (mg/L)	0.00166	0.00073	0.00142	0.00054	0.00076
	Copper (Cu)-Total (mg/L)	0.0042	0.0031	0.0041	0.0021	0.0027
	Iron (Fe)-Total (mg/L)	1.40	0.634	1.73	1.01	1.01
	Lead (Pb)-Total (mg/L)	0.00077	<0.00050	0.00132	<0.00050	<0.00050
	Lithium (Li)-Total (mg/L)	0.0088	0.0035	0.0039	0.0058	0.0033
	Magnesium (Mg)-Total (mg/L)	45.0	9.51	34.5	42.2	45.5
	Manganese (Mn)-Total (mg/L)	0.378	0.0625	0.400	0.143	0.280
	Mercury (Hg)-Total (mg/L)	0.0000114	<0.0000050	0.0000128	0.0000052	0.0000056
	Molybdenum (Mo)-Total (mg/L)	0.0016	<0.0010	0.0015	<0.0010	0.0013
	Nickel (Ni)-Total (mg/L)	0.0164	0.0038	0.0065	0.0047	0.0044
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Total (mg/L)	0.00190	0.000317	0.00298	0.000780	0.000985
	Silicon (Si)-Total (mg/L)	6.02	5.82	6.02	6.36	6.61
	Silver (Ag)-Total (mg/L)	0.000033	<0.000020	0.000031	<0.000020	<0.000020
	Sodium (Na)-Total (mg/L)	4.2	3.7	3.5	3.2	4.4
	Strontium (Sr)-Total (mg/L)	0.433	0.158	0.425	0.328	0.347
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Total (mg/L)	0.021	<0.010	0.032	0.012	0.011
	Uranium (U)-Total (mg/L)	0.00242	0.00100	0.00253	0.00350	0.00319
	Vanadium (V)-Total (mg/L)	0.00227	0.00151	0.00255	0.00164	0.00172
	Zinc (Zn)-Total (mg/L)	0.0147	0.0054	0.0138	<0.0050	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829615-11 Water 05-SEP-16 11:40 R-4	L1829615-12 Water 08-SEP-16 16:40 R-6	L1829615-13 Water 08-SEP-16 12:00 MAIDEN CR	L1829615-14 Water FIELD BLANK	L1829615-15 Water TRAVEL BLANK
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	610	243	196	<2.0	<2.0
	Hardness (as CaCO3) (mg/L)	324	111	84.0	<0.50	
	pH (pH)	8.26	8.06	7.15	5.57	5.53
Anions and Nutrients	Sulfate (SO4) (mg/L)	159	45.9	53.5	<0.30	<0.30
Total Metals	Aluminum (Al)-Total (mg/L)	2.22	0.334	2.21	<0.0050	
	Antimony (Sb)-Total (mg/L)	0.00067	<0.00050	<0.00050	<0.00050	
	Arsenic (As)-Total (mg/L)	0.00493	0.00078	0.00210	<0.00050	
	Barium (Ba)-Total (mg/L)	0.183	0.052	0.104	<0.020	
	Beryllium (Be)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Bismuth (Bi)-Total (mg/L)	<0.20	<0.20	<0.20	<0.20	
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	
	Cadmium (Cd)-Total (mg/L)	0.000365	0.0000315	0.000186	<0.0000050	
	Calcium (Ca)-Total (mg/L)	84.1	32.3	17.2	<0.10	
	Chromium (Cr)-Total (mg/L)	0.0052	<0.0010	0.0039	<0.0010	
	Cobalt (Co)-Total (mg/L)	0.00376	0.00078	0.00272	<0.00030	
	Copper (Cu)-Total (mg/L)	0.0123	0.0033	0.0081	<0.0010	
	Iron (Fe)-Total (mg/L)	4.98	0.762	3.38	<0.030	
	Lead (Pb)-Total (mg/L)	0.00330	<0.00050	0.00189	<0.00050	
	Lithium (Li)-Total (mg/L)	0.0040	0.0031	0.0021	<0.0010	
	Magnesium (Mg)-Total (mg/L)	33.4	10.0	12.1	<0.10	
	Manganese (Mn)-Total (mg/L)	0.433	0.0676	0.252	<0.00010	
	Mercury (Hg)-Total (mg/L)	0.000064 ^{DLM}	<0.0000050	0.0000108	<0.0000050	
	Molybdenum (Mo)-Total (mg/L)	0.0024	<0.0010	<0.0010	<0.0010	
	Nickel (Ni)-Total (mg/L)	0.0242	0.0040	0.0087	<0.0010	
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	
	Potassium (K)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	
	Selenium (Se)-Total (mg/L)	0.00363	0.000280	0.000582	<0.000050	
	Silicon (Si)-Total (mg/L)	8.86	6.35	8.56	<0.050	
	Silver (Ag)-Total (mg/L)	0.000169	<0.000020	0.000036	<0.000020	
	Sodium (Na)-Total (mg/L)	4.5	3.9	2.4	<2.0	
	Strontium (Sr)-Total (mg/L)	0.439	0.166	0.0852	<0.0050	
	Thallium (Tl)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
	Tin (Sn)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Titanium (Ti)-Total (mg/L)	0.058	0.011	0.066	<0.010	
	Uranium (U)-Total (mg/L)	0.00353	0.00099	0.00067	<0.00020	
	Vanadium (V)-Total (mg/L)	0.00774	0.00169	0.00631	<0.00050	
	Zinc (Zn)-Total (mg/L)	0.0245	0.0057	0.0214	<0.0050	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L1829615-16 Water 06-SEP-16 DUPLICATE				
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)	684					
	Hardness (as CaCO3) (mg/L)	366					
	pH (pH)	8.09					
Anions and Nutrients	Sulfate (SO4) (mg/L)	219					
Total Metals	Aluminum (Al)-Total (mg/L)	0.0525					
	Antimony (Sb)-Total (mg/L)	<0.00050					
	Arsenic (As)-Total (mg/L)	0.00115					
	Barium (Ba)-Total (mg/L)	0.066					
	Beryllium (Be)-Total (mg/L)	<0.0010					
	Bismuth (Bi)-Total (mg/L)	<0.20					
	Boron (B)-Total (mg/L)	<0.10					
	Cadmium (Cd)-Total (mg/L)	0.0000521					
	Calcium (Ca)-Total (mg/L)	80.1					
	Chromium (Cr)-Total (mg/L)	<0.0010					
	Cobalt (Co)-Total (mg/L)	0.00067					
	Copper (Cu)-Total (mg/L)	0.0026					
	Iron (Fe)-Total (mg/L)	0.355					
	Lead (Pb)-Total (mg/L)	<0.00050					
	Lithium (Li)-Total (mg/L)	0.0073					
	Magnesium (Mg)-Total (mg/L)	43.9					
	Manganese (Mn)-Total (mg/L)	0.179					
	Mercury (Hg)-Total (mg/L)	0.0000058					
	Molybdenum (Mo)-Total (mg/L)	0.0014					
	Nickel (Ni)-Total (mg/L)	0.0115					
	Phosphorus (P)-Total (mg/L)	<0.30					
	Potassium (K)-Total (mg/L)	<2.0					
	Selenium (Se)-Total (mg/L)	0.00184					
	Silicon (Si)-Total (mg/L)	5.13					
	Silver (Ag)-Total (mg/L)	<0.000020					
	Sodium (Na)-Total (mg/L)	3.5					
	Strontium (Sr)-Total (mg/L)	0.412					
	Thallium (Tl)-Total (mg/L)	<0.00020					
	Tin (Sn)-Total (mg/L)	<0.00050					
	Titanium (Ti)-Total (mg/L)	<0.010					
	Uranium (U)-Total (mg/L)	0.00198					
	Vanadium (V)-Total (mg/L)	0.00071					
	Zinc (Zn)-Total (mg/L)	<0.0050					

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829615-1 Water 06-SEP-16 14:30 E-1	L1829615-2 Water 07-SEP-16 09:40 PORCUPINE CR	L1829615-3 Water 06-SEP-16 16:30 E-2	L1829615-4 Water 06-SEP-16 09:00 E-3	L1829615-5 Water 05-SEP-16 13:10 E-4
Grouping	Analyte					
WATER						
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0432	<0.0050	0.0348	0.0303	0.0294
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	0.00148	<0.00050	0.00054	<0.00050
	Arsenic (As)-Dissolved (mg/L)	0.00078	0.00255	0.00105	0.00085	0.00108
	Barium (Ba)-Dissolved (mg/L)	0.065	0.025	0.059	0.063	0.058
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Dissolved (mg/L)	<0.10	0.22	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	0.0000391	0.000181	0.0000500	0.0000248	0.0000419
	Calcium (Ca)-Dissolved (mg/L)	64.4	185	74.9	60.8	73.9
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	0.0024	<0.0010	0.0051	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	0.00043	<0.00030	0.00061	0.00051	0.00066
	Copper (Cu)-Dissolved (mg/L)	0.0027	0.0011	0.0024	0.0018	0.0021
	Iron (Fe)-Dissolved (mg/L)	0.246	<0.030	0.268	0.280	0.284
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	0.0028	0.0629	0.0073	0.0035	0.0091
	Magnesium (Mg)-Dissolved (mg/L)	29.3	221	44.5	44.9	49.0
	Manganese (Mn)-Dissolved (mg/L)	0.164	0.00116	0.160	0.170	0.174
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.0012	0.0024	0.0014	0.0012	0.0014
	Nickel (Ni)-Dissolved (mg/L)	0.0044	0.0594	0.0107	0.0080	0.0117
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	<2.0	2.8	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	0.00192	0.00514	0.00198	0.00146	0.00196
	Silicon (Si)-Dissolved (mg/L)	4.88	6.08	4.86	5.77	4.93
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	2.3	14.0	2.9	4.0	3.5
	Strontium (Sr)-Dissolved (mg/L)	0.278	1.65	0.373	0.284	0.389
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.00178	0.00526	0.00196	0.00236	0.00207
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	0.00055	<0.00050
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	0.0063	<0.0050	<0.0050	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829615-6 Water 05-SEP-16 09:30 E-6	L1829615-7 Water 08-SEP-16 14:50 E-8	L1829615-8 Water 07-SEP-16 12:45 R-1	L1829615-9 Water 07-SEP-16 15:00 R-2	L1829615-10 Water 06-SEP-16 11:30 R-3
Grouping	Analyte					
WATER						
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0286	0.0922	0.0289	0.0406	0.0298
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Dissolved (mg/L)	0.00123	0.00060	0.00057	0.00108	0.00067
	Barium (Ba)-Dissolved (mg/L)	0.068	0.043	0.057	0.052	0.064
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Dissolved (mg/L)	0.0000492	0.0000256	0.0000749	0.0000271	0.0000190
	Calcium (Ca)-Dissolved (mg/L)	74.7	30.8	90.2	59.4	69.5
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Cobalt (Co)-Dissolved (mg/L)	0.00111	0.00056	0.00071	0.00034	0.00052
	Copper (Cu)-Dissolved (mg/L)	0.0022	0.0027	0.0019	0.0016	0.0018
	Iron (Fe)-Dissolved (mg/L)	0.323	0.300	0.269	0.519	0.365
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Lithium (Li)-Dissolved (mg/L)	0.0087	0.0036	0.0028	0.0057	0.0027
	Magnesium (Mg)-Dissolved (mg/L)	48.3	9.40	36.4	43.6	46.9
	Manganese (Mn)-Dissolved (mg/L)	0.351	0.0544	0.331	0.130	0.261
	Mercury (Hg)-Dissolved (mg/L)	0.0000051	<0.0000050	<0.0000050	<0.0000050	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.0014	<0.0010	0.0012	<0.0010	0.0011
	Nickel (Ni)-Dissolved (mg/L)	0.0131	0.0034	0.0042	0.0041	0.0037
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Selenium (Se)-Dissolved (mg/L)	0.00186	0.000295	0.00291	0.000725	0.000994
	Silicon (Si)-Dissolved (mg/L)	4.98	5.54	4.71	5.82	6.00
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Sodium (Na)-Dissolved (mg/L)	3.4	3.0	2.6	2.4	3.6
	Strontium (Sr)-Dissolved (mg/L)	0.383	0.143	0.374	0.293	0.311
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.00231	0.00098	0.00226	0.00341	0.00302
	Vanadium (V)-Dissolved (mg/L)	<0.00050	0.00079	<0.00050	0.00066	0.00060
	Zinc (Zn)-Dissolved (mg/L)	0.0062	<0.0050	<0.0050	<0.0050	<0.0050

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829615-11 Water 05-SEP-16 11:40 R-4	L1829615-12 Water 08-SEP-16 16:40 R-6	L1829615-13 Water 08-SEP-16 12:00 MAIDEN CR	L1829615-14 Water FIELD BLANK	L1829615-15 Water TRAVEL BLANK
Grouping	Analyte					
WATER						
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	
	Aluminum (Al)-Dissolved (mg/L)	0.0199	0.0846	0.172	<0.0050	
	Antimony (Sb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Arsenic (As)-Dissolved (mg/L)	0.00207	0.00059	0.00076	<0.00050	
	Barium (Ba)-Dissolved (mg/L)	0.090	0.041	0.049	<0.020	
	Beryllium (Be)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Bismuth (Bi)-Dissolved (mg/L)	<0.20	<0.20	<0.20	<0.20	
	Boron (B)-Dissolved (mg/L)	<0.10	<0.10	<0.10	<0.10	
	Cadmium (Cd)-Dissolved (mg/L)	0.0000464	0.0000227	0.0000397	<0.0000050	
	Calcium (Ca)-Dissolved (mg/L)	76.7	29.3	15.6	<0.10	
	Chromium (Cr)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Cobalt (Co)-Dissolved (mg/L)	0.00123	0.00055	0.00126	<0.00030	
	Copper (Cu)-Dissolved (mg/L)	0.0019	0.0026	0.0039	<0.0010	
	Iron (Fe)-Dissolved (mg/L)	0.159	0.306	0.516	<0.030	
	Lead (Pb)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Lithium (Li)-Dissolved (mg/L)	0.0020	0.0032	<0.0010	<0.0010	
	Magnesium (Mg)-Dissolved (mg/L)	32.1	9.09	10.9	<0.10	
	Manganese (Mn)-Dissolved (mg/L)	0.299	0.0508	0.188	<0.00010	
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050	0.0000059	<0.0000050	
	Molybdenum (Mo)-Dissolved (mg/L)	0.0013	<0.0010	<0.0010	<0.0010	
	Nickel (Ni)-Dissolved (mg/L)	0.0117	0.0032	0.0050	<0.0010	
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	
	Potassium (K)-Dissolved (mg/L)	<2.0	<2.0	<2.0	<2.0	
	Selenium (Se)-Dissolved (mg/L)	0.00324	0.000257	0.000574	<0.000050	
	Silicon (Si)-Dissolved (mg/L)	5.44	5.56	5.74	<0.050	
	Silver (Ag)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	
	Sodium (Na)-Dissolved (mg/L)	3.6	3.0	<2.0	<2.0	
	Strontium (Sr)-Dissolved (mg/L)	0.371	0.140	0.0714	<0.0050	
	Thallium (Tl)-Dissolved (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	
	Tin (Sn)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	
	Uranium (U)-Dissolved (mg/L)	0.00314	0.00087	0.00042	<0.00020	
	Vanadium (V)-Dissolved (mg/L)	<0.00050	0.00080	0.00078	<0.00050	
	Zinc (Zn)-Dissolved (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829615-16 Water 06-SEP-16 DUPLICATE				
Grouping	Analyte					
WATER						
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD				
	Dissolved Metals Filtration Location	FIELD				
	Aluminum (Al)-Dissolved (mg/L)	0.0370				
	Antimony (Sb)-Dissolved (mg/L)	<0.00050				
	Arsenic (As)-Dissolved (mg/L)	0.00106				
	Barium (Ba)-Dissolved (mg/L)	0.058				
	Beryllium (Be)-Dissolved (mg/L)	<0.0010				
	Bismuth (Bi)-Dissolved (mg/L)	<0.20				
	Boron (B)-Dissolved (mg/L)	<0.10				
	Cadmium (Cd)-Dissolved (mg/L)	0.0000497				
	Calcium (Ca)-Dissolved (mg/L)	73.2				
	Chromium (Cr)-Dissolved (mg/L)	<0.0010				
	Cobalt (Co)-Dissolved (mg/L)	0.00063				
	Copper (Cu)-Dissolved (mg/L)	0.0024				
	Iron (Fe)-Dissolved (mg/L)	0.256				
	Lead (Pb)-Dissolved (mg/L)	<0.00050				
	Lithium (Li)-Dissolved (mg/L)	0.0072				
	Magnesium (Mg)-Dissolved (mg/L)	44.5				
	Manganese (Mn)-Dissolved (mg/L)	0.166				
	Mercury (Hg)-Dissolved (mg/L)	0.0000051				
	Molybdenum (Mo)-Dissolved (mg/L)	0.0014				
	Nickel (Ni)-Dissolved (mg/L)	0.0110				
	Phosphorus (P)-Dissolved (mg/L)	<0.30				
	Potassium (K)-Dissolved (mg/L)	<2.0				
	Selenium (Se)-Dissolved (mg/L)	0.00195				
	Silicon (Si)-Dissolved (mg/L)	4.75				
	Silver (Ag)-Dissolved (mg/L)	<0.000020				
	Sodium (Na)-Dissolved (mg/L)	2.8				
	Strontium (Sr)-Dissolved (mg/L)	0.368				
	Thallium (Tl)-Dissolved (mg/L)	<0.00020				
	Tin (Sn)-Dissolved (mg/L)	<0.00050				
	Titanium (Ti)-Dissolved (mg/L)	<0.010				
	Uranium (U)-Dissolved (mg/L)	0.00199				
	Vanadium (V)-Dissolved (mg/L)	<0.00050				
	Zinc (Zn)-Dissolved (mg/L)	<0.0050				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Aluminum (Al)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Antimony (Sb)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Uranium (U)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1829615-1, -10, -11, -12, -13, -14, -16, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Aluminum (Al)-Total	MS-B	L1829615-1, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Aluminum (Al)-Total	MS-B	L1829615-10, -11, -12, -13, -14, -16, -9
Matrix Spike	Manganese (Mn)-Total	MS-B	L1829615-1, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Manganese (Mn)-Total	MS-B	L1829615-10, -11, -12, -13, -14, -16, -9
Matrix Spike	Calcium (Ca)-Total	MS-B	L1829615-1, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Iron (Fe)-Total	MS-B	L1829615-1, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Iron (Fe)-Total	MS-B	L1829615-10, -11, -12, -13, -14, -16, -9
Matrix Spike	Silicon (Si)-Total	MS-B	L1829615-1, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Silicon (Si)-Total	MS-B	L1829615-10, -11, -12, -13, -14, -16, -9
Matrix Spike	Strontium (Sr)-Total	MS-B	L1829615-1, -2, -3, -4, -5, -6, -7, -8
Matrix Spike	Sulfate (SO4)	MS-B	L1829615-2
Matrix Spike	Sulfate (SO4)	MS-B	L1829615-2

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
AREA SAMPLED-VA	Biota	Area Sampled (cm2)	Not Applicable

Reference Information

CHLOROA-F-VA Biota Chlorophyll a in Biota by Fluorometer EPA 445.0

This analysis is done using procedures adapted from EPA Method 445.0. Chlorophyll-a is determined by a routine acetone extraction followed with analysis by fluorometry using the non-acidification procedure. This method is not subject to interferences from chlorophyll b. Note: Biota samples are typically submitted as scrapings on a filter.

EC-PCT-VA Water Conductivity (Automated) APHA 2510 Auto. Conduc.

This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-D-CVAA-VA Water Diss. Mercury in Water by CVAAS or CVAFS APHA 3030B/EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

HG-T-CVAA-VA Water Total Mercury in Water by CVAAS or CVAFS EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.

MET-D-CCMS-VA Water Dissolved Metals in Water by CRC ICPMS APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-DIS-ICP-VA Water Dissolved Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-TOT-ICP-VA Water Total Metals in Water by ICPOES EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA Water pH by Meter (Automated) APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PHEOPHYTIN-F-VA Biota Pheophytin a in Biota by Fluorometer EPA 445.0

This analysis is done using procedures modified from EPA 445.0. Pheopigments present in a biota sample are determined collectively as pheophytin a. Pheophytin a is determined by a routine acetone extraction followed with analysis by fluorometry using the acidification procedure.

Note: Biota samples are typically submitted as scrapings on a filter.

Reference Information

SO4-IC-N-VA Water Sulfate in Water by IC EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

14-470932, 14-470930

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg ww - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



23-Sep-2016

Brent Mack
ALS Environmental
8081 Lougheed HWY
Suite 100
Burnaby, BC V5A1W9

Tel: (604) 253-4188
Fax:

Re: L1829615

Work Order: **1609561**

Dear Brent,

ALS Environmental received 16 samples on 20-Sep-2016 10:35 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 22.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Shawn Smythe

Electronically approved by: Chris Gibson

Shawn Smythe
Project Manager

ADDRESS 4388 Glendale Milford Rd Cincinnati, Ohio 45242- | PHONE (513) 733-5336 | FAX (513) 733-5347

ALS GROUP USA, CORP. Part of the ALS Group An ALS Limited Company

Environmental 

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental
Project: L1829615
Work Order: 1609561

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1609561-01	L1829615-1	Water		9/6/2016	9/20/2016 10:35	☐
1609561-02	L1829615-2	Water		9/7/2016	9/20/2016 10:35	☐
1609561-03	L1829615-3	Water		9/6/2016	9/20/2016 10:35	☐
1609561-04	L1829615-4	Water		9/6/2016	9/20/2016 10:35	☐
1609561-05	L1829615-5	Water		9/5/2016	9/20/2016 10:35	☐
1609561-06	L1829615-6	Water		9/5/2016	9/20/2016 10:35	☐
1609561-07	L1829615-7	Water		9/8/2016	9/20/2016 10:35	☐
1609561-08	L1829615-8	Water		9/7/2016	9/20/2016 10:35	☐
1609561-09	L1829615-9	Water		9/7/2016	9/20/2016 10:35	☐
1609561-10	L1829615-10	Water		9/6/2016	9/20/2016 10:35	☐
1609561-11	L1829615-11	Water		9/5/2016	9/20/2016 10:35	☐
1609561-12	L1829615-12	Water		9/8/2016	9/20/2016 10:35	☐
1609561-13	L1829615-13	Water		9/8/2016	9/20/2016 10:35	☐
1609561-14	L1829615-14	Water			9/20/2016 10:35	☐
1609561-15	L1829615-15	Water			9/20/2016 10:35	☐
1609561-16	L1829615-16	Water			9/20/2016 10:35	☐

Client: ALS Environmental
Project: L1829615
Work Order: 1609561

Case Narrative

The sample condition upon receipt was acceptable except where noted.

Results relate only to the items tested and are not blank corrected unless indicated.

Compound identification is based upon retention time matching only. Any compound with a similar retention time will interfere.

Samples were prepared and analyzed by the analytical method and the laboratory's applicable standard operating procedure listed below:

- IH-001- "Determination of Analytes Using NIOSH and OSHA Methods Using Gas Chromatography."
- IH-002- "Determination of Suspended Particulates in the Atmosphere Using Various Media"
- IH-003- "Determination of Suspended Particulates Not Otherwise Regulated (Total and Respirable)."
- IH-004- "Determination of Analytes by NIOSH and OSHA Methods Using Liquid Chromatography."
- IH-005- "Benzene-Soluble Fraction and Total Particulate (Asphalt Fume)."
- IH-006- "Methods IO-3.1 and IO-3.4 Modified for Metals Preparation and Analysis for Suspended Particulates."
- IH-196- "Carbon Black by OSHA 196."
- IH-6009- "Determination of Mercury in Industrial Hygiene Samples by Manual Cold Vapor Atomic Absorption Spectroscopy."
- ENV-6010B- "Determination of Trace Metals in Solution by Inductively Coupled Plasma-Atomic Emission Spectroscopy by EPA Method 6010B Non-VAP."
- IH-7300 modified- "Elements by ICP."

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental

Project: L1829615

Work Order: 1609561

Sample ID: L1829615-1

Lab ID: 1609561-01

Collection Date: 9/6/2016

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			E160.2			Analyst: rmb
Total suspended solids	2.4		2.0	mg/L	1	9/20/2016

Note:

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental

Project: L1829615

Work Order: 1609561

Sample ID: L1829615-2

Lab ID: 1609561-02

Collection Date: 9/7/2016

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			E160.2			Analyst: rmb
Total suspended solids	2.4		2.0	mg/L	1	9/20/2016

Note:

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental

Project: L1829615

Work Order: 1609561

Sample ID: L1829615-3

Lab ID: 1609561-03

Collection Date: 9/6/2016

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			E160.2			Analyst: rmb
Total suspended solids	2.2		2.0	mg/L	1	9/20/2016

Note:

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental

Project: L1829615

Work Order: 1609561

Sample ID: L1829615-4

Lab ID: 1609561-04

Collection Date: 9/6/2016

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			E160.2			Analyst: rmb
Total suspended solids	63		2.0	mg/L	1	9/20/2016

Note:

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental

Project: L1829615

Work Order: 1609561

Sample ID: L1829615-5

Lab ID: 1609561-05

Collection Date: 9/5/2016

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			E160.2			Analyst: rmb
Total suspended solids	4.9		2.0	mg/L	1	9/20/2016

Note:

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental

Project: L1829615

Work Order: 1609561

Sample ID: L1829615-6

Lab ID: 1609561-06

Collection Date: 9/5/2016

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			E160.2			Analyst: rmb
Total suspended solids	32		2.0	mg/L	1	9/20/2016

Note:

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental

Project: L1829615

Work Order: 1609561

Sample ID: L1829615-7

Lab ID: 1609561-07

Collection Date: 9/8/2016

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			E160.2			Analyst: rmb
Total suspended solids	7.7		2.0	mg/L	1	9/20/2016

Note:

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental

Project: L1829615

Work Order: 1609561

Sample ID: L1829615-8

Lab ID: 1609561-08

Collection Date: 9/7/2016

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			E160.2			Analyst: rmb
Total suspended solids	37		2.0	mg/L	1	9/20/2016

Note:

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental

Project: L1829615

Work Order: 1609561

Sample ID: L1829615-9

Lab ID: 1609561-09

Collection Date: 9/7/2016

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			E160.2			Analyst: rmb
Total suspended solids	9.8		2.0	mg/L	1	9/20/2016

Note:

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental

Project: L1829615

Work Order: 1609561

Sample ID: L1829615-10

Lab ID: 1609561-10

Collection Date: 9/6/2016

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			E160.2			Analyst: rmb
Total suspended solids	12		2.0	mg/L	1	9/20/2016

Note:

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental

Project: L1829615

Work Order: 1609561

Sample ID: L1829615-11

Lab ID: 1609561-11

Collection Date: 9/5/2016

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			E160.2			Analyst: rmb
Total suspended solids	130		2.0	mg/L	1	9/20/2016

Note:

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental

Project: L1829615

Work Order: 1609561

Sample ID: L1829615-12

Lab ID: 1609561-12

Collection Date: 9/8/2016

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			E160.2			Analyst: rmb
Total suspended solids	4.9		2.0	mg/L	1	9/20/2016

Note:

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental

Project: L1829615

Work Order: 1609561

Sample ID: L1829615-13

Lab ID: 1609561-13

Collection Date: 9/8/2016

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			E160.2			Analyst: rmb
Total suspended solids	98		2.0	mg/L	1	9/20/2016

Note:

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental

Project: L1829615

Sample ID: L1829615-14

Collection Date:

Work Order: 1609561

Lab ID: 1609561-14

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			E160.2			Analyst: rmb
Total suspended solids	2.6		2.0	mg/L	1	9/20/2016

Note:

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental

Project: L1829615

Sample ID: L1829615-15

Collection Date:

Work Order: 1609561

Lab ID: 1609561-15

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			E160.2			Analyst: rmb
Total suspended solids	2.0		2.0	mg/L	1	9/20/2016

Note:

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental

Project: L1829615

Sample ID: L1829615-16

Collection Date:

Work Order: 1609561

Lab ID: 1609561-16

Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
TOTAL SUSPENDED SOLIDS			E160.2			Analyst: rmb
Total suspended solids	ND		2.0	mg/L	1	9/20/2016

Note:

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental
Work Order: 1609561
Project: L1829615

QC BATCH REPORT

Batch ID: **R133102** Instrument ID **WETCHEM** Method: **E160.2**

MBLK	Sample ID: MB-R133102-R133102					Units: mg/L	Analysis Date: 9/20/2016			
Client ID:	Run ID: WETCHEM_160920C					SeqNo: 1360373	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Total suspended solids ND 2.0

LCS	Sample ID: LCS-R133102-R133102					Units: mg/L	Analysis Date: 9/20/2016			
Client ID:	Run ID: WETCHEM_160920C					SeqNo: 1360374	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Total suspended solids 942.1 2.0 1000 0 94.2 70-130 0

DUP	Sample ID: 1609561-02A Dup					Units: mg/L	Analysis Date: 9/20/2016			
Client ID: L1829615-2	Run ID: WETCHEM_160920C					SeqNo: 1360378	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Total suspended solids 2.91 2.0 0 0 0 2.39 19.6

DUP	Sample ID: 1609561-16A Dup					Units: mg/L	Analysis Date: 9/20/2016			
Client ID: L1829615-16	Run ID: WETCHEM_160920C					SeqNo: 1360393	Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

Total suspended solids ND 2.0 0 0 0 1.6 0

The following samples were analyzed in this batch:

1609561-01A	1609561-02A	1609561-03A
1609561-04A	1609561-05A	1609561-06A
1609561-07A	1609561-08A	1609561-09A
1609561-10A	1609561-11A	1609561-12A
1609561-13A	1609561-14A	1609561-15A
1609561-16A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

ALS Environmental

Date: 23-Sep-16

Client: ALS Environmental
Project: L1829615
WorkOrder: 1609561

QUALIFIERS, ACRONYMS, UNITS

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SDL	Sample Detection Limit
SW	SW-846 Method

<u>Units Reported</u>	<u>Description</u>
mg/L	

Sample Receipt Checklist

Client Name: **ALS-VANCOUVER**

Date/Time Received: **20-Sep-16 10:35**

Work Order: **1609561**

Received by: **RDN**

Checklist completed by **Stephanie Harrington**

20-Sep-16

Reviewed by: **Shawn Smythe**

21-Sep-16

eSignature

Date

eSignature

Date

Matrices:

Carrier name: **FedEx**

Shipping container/cooler in good condition?

Yes ☒

No ☐

Not Present ☐

Custody seals intact on shipping container/cooler?

Yes ☐

No ☐

Not Present ☒

Custody seals intact on sample bottles?

Yes ☐

No ☐

Not Present ☒

Chain of custody present?

Yes ☒

No ☐

Chain of custody signed when relinquished and received?

Yes ☒

No ☐

Chain of custody agrees with sample labels?

Yes ☒

No ☐

Samples in proper container/bottle?

Yes ☒

No ☐

Sample containers intact?

Yes ☒

No ☐

Sufficient sample volume for indicated test?

Yes ☒

No ☐

All samples received within holding time?

Yes ☒

No ☐

Container/Temp Blank temperature in compliance?

Yes ☒

No ☐

Temperature(s)/Thermometer(s):

5.2

Cooler(s)/Kit(s):

Water - VOA vials have zero headspace?

Yes ☐

No ☐

No VOA vials submitted ☒

Water - pH acceptable upon receipt?

Yes ☐

No ☐

N/A ☒

pH adjusted?

Yes ☐

No ☐

N/A ☒

pH adjusted by:

-

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction:

- *Rush Processing*

Canada Toll Free: 1 800 668 9878



L1829615-COFC

Page 1 of 2

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an Authorized DW COC form.

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

RIA EM 01254-2017 contida January 2017

SEP 13 2016

- *Rush Processing*

Canada Toll Free: 1 800 668 9878



L1829615-COFC

COC Number: 14 - 470930

Page 1 of 2

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

SEP 13 1944

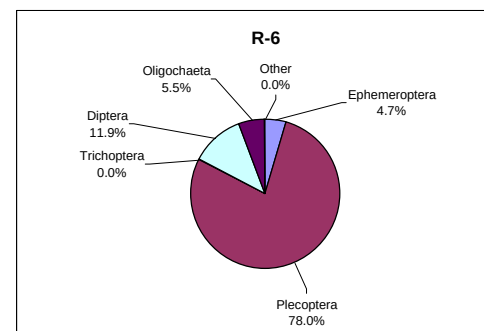
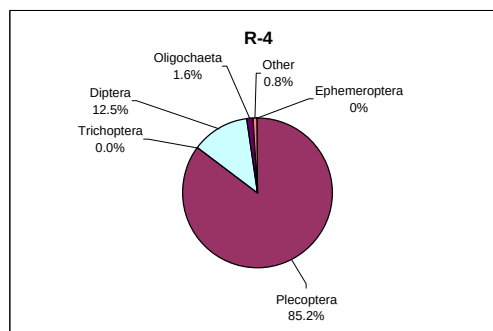
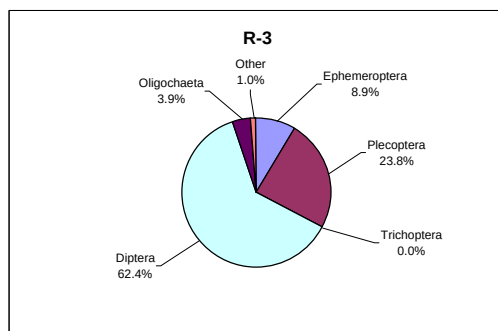
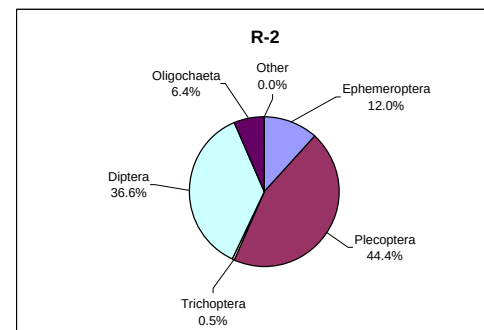
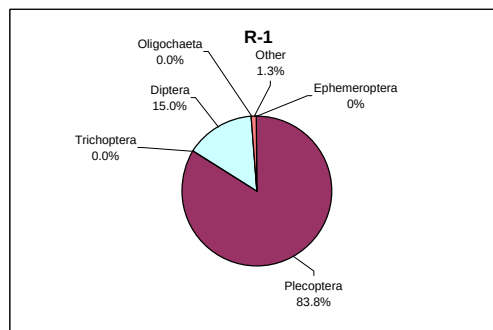
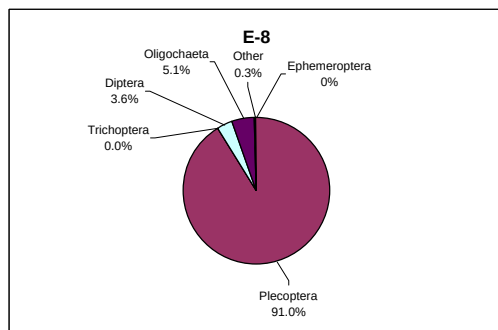
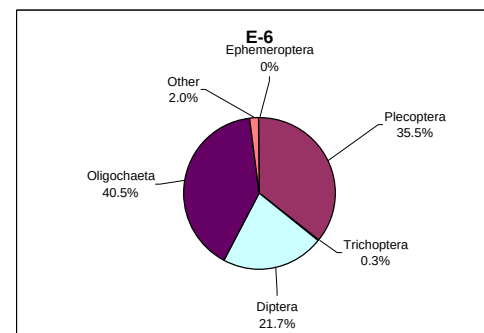
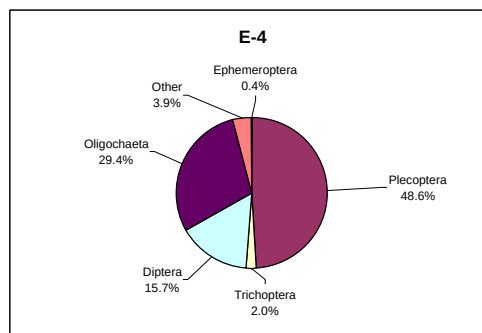
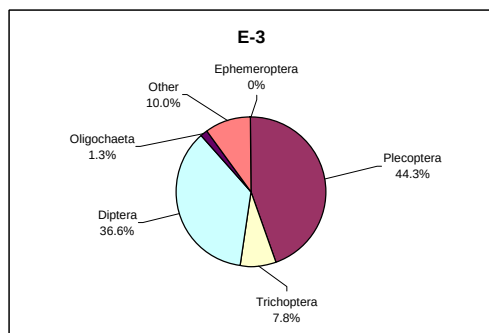
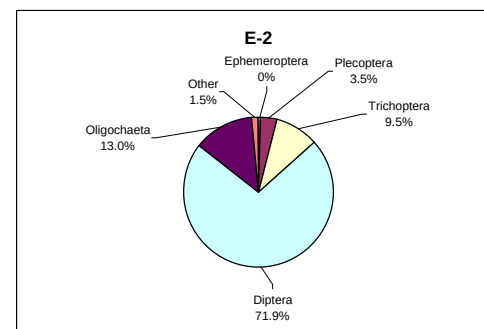
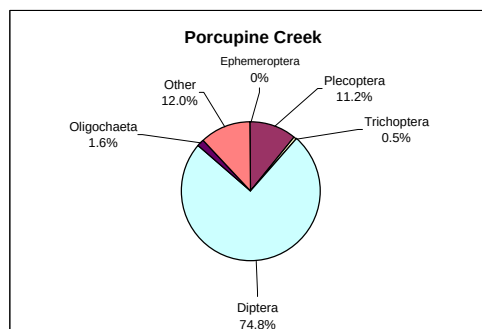
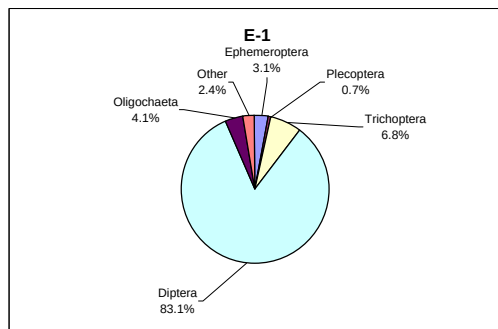
Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

APPENDIX E

BENTHIC INVERTEBRATE DATA, 2016

FIGURE 5 COMPOSITION OF EACH BENTHIC INVERTEBRATE COMMUNITY, SEPTEMBER 2016



Sample: Sample Collection Date: SubSample %:	E-1 06-Sep-16 100	Porcupine Creek 07-Sep-16 16	E-2 06-Sep-16 30	E-3 06-Sep-16 100	E-4 05-Sep-16 100	E-6 05-Sep-16 100	E-8 08-Sep-16 9
Phylum: Arthropoda							
Order: Collembola							
Family: Hypogastruridae							11
Family: Sminthuridae						2	
Subphylum: Hexapoda							
Class: Insecta							
Order: Ephemeroptera							
Family: Ameletidae							
<u>Ameletus</u>							
Family: Baetidae	1				1		
<u>Baetis</u>	10		7				
<u>Baetis tricaudatus group</u>	1						
Family: Ephemerellidae							
<u>Ephemerella</u>	1						
Family: Heptageniidae	1						
<u>Cinygmula</u>							
<u>Rhithrogena</u>							
Order: Plecoptera							
Family: Capniidae	1	88	33	63	120	102	3356
Family: Chloroperlidae	1				2		
<u>Haploperla</u>							
Family: Leuctridae				1			
Family: Nemouridae		138		77			
<u>Nemoura</u>		88	3	6			
<u>Ostrocerca</u>							
<u>Podmosta</u>				53			
<u>Zapada columbiana</u>	1						
Family: Perlodidae							
<u>Isoperla</u>			3		2	3	
Family: Taeniopterygidae							
<u>Taenionema</u>						1	
Order: Trichoptera							
Family: Apataniidae							
<u>Apatania</u>			3				
Family: Brachycentridae							
<u>Brachycentrus</u>	4		13	15	3		
<u>Brachycentrus americanus</u>	26		83	2	2		
Family: Glossosomatidae				5			
<u>Glossosoma</u>	1			12			
Family: Hydropsychidae						1	
Family: Limnephilidae		13	7				
<u>Ecclisomyia</u>				1			
Order: Diptera				1	1	1	
Family: Ceratopogonidae						1	
<u>Probezzia</u>		6	53		2		
Family: Chironomidae	15	44	3		1	1	
Subfamily: Chironominae							
Tribe: Chironomini							
<u>Polypedilum</u>	1						11
Tribe: Tanytarsini							
<u>Cladotanytarsus</u>							
<u>Constempellina sp. C</u>							

Sample:	E-1	Porcupine Creek	E-2	E-3	E-4	E-6	E-8
Sample Collection Date:	06-Sep-16	07-Sep-16	06-Sep-16	06-Sep-16	05-Sep-16	05-Sep-16	08-Sep-16
SubSample %:	100	16	30	100	100	100	9
<i>Micropsectra</i>	14	31	13			1	
<i>Paratanytarsus</i>							
<i>Stempellina</i>					2		44
<i>Tanytarsus</i>							
Subfamily: Diamesinae							
<i>Pseudokiefferiella</i>				1			
Tribe: Diamesini							
<i>Diamesa</i>		381					
<i>Pagastia</i>		100	7	4	1	1	
<i>Pseudodiamesa</i>		6					
Subfamily: Orthocladiinae	7	38					
<i>Brillia</i>							11
<i>Corynoneura</i>	1		3				
<i>Diplocladius</i>				1			
<i>Eukiefferiella</i>	78	44	30	57	2	6	11
<i>Euryhapsis</i>	2						
<i>Hydrobaenus</i>		19	7			4	
<i>Hydrosmittia</i>							
<i>Krenosmittia</i>					1	1	
<i>Limnophyes</i>							
<i>Metriocnemus</i>							
<i>Nanocladius</i>			3				
<i>Orthocladius complex</i>	42	1194	50	16	2	6	44
<i>Parakiefferiella</i>						1	
<i>Parametriocnemus</i>				1		0	
<i>Paraphaenocladius</i>	42		197		2	1	
<i>Parorthocladius</i>		13		1			
<i>Pseudosmittia</i>		6					
<i>Tvetenia</i>	41		77	15			
Subfamily: Tanypodinae							
Tribe: Pentaneurini							
<i>Thienemannimyia group</i>	78		63		1		
Family: Empididae	9	6	63	50	6	26	11
<i>Neoplasta</i>	19		23	7	1		
<i>Trichoclinocera</i>	2				1		
Family: Muscidae							
<i>Limnophora</i>		113					
Family: Psychodidae							
<i>Pericoma/Telmatoscopus</i>		56					
Family: Simuliidae	2				1		
<i>Metacnephia</i>				1			
<i>Prosimulium</i>							
<i>Simulium</i>	24		100			1	
Family: Tabanidae							
<i>Tabanus</i>							
Family: Tipulidae							
<i>Dicranota</i>	3	44	113	10	16	11	
<i>Gonomyodes</i>	1					2	
<i>Limnophila</i>						1	
Subphylum: Chelicerata							
Class: Arachnida							
Order: Trombidiformes							
Family: Lebertiidae							
<i>Lebertia</i>				1	4		
Family: Sperchontidae							

Sample:	E-1	Porcupine Creek	E-2	E-3	E-4	E-6	E-8
Sample Collection Date:	06-Sep-16	07-Sep-16	06-Sep-16	06-Sep-16	05-Sep-16	05-Sep-16	08-Sep-16
SubSample %:	100	16	30	100	100	100	9
<i>Sperchon</i>	9	56	17	1	5	3	
Order: Sarcophagidae				0			
Family: Hydrozetidae				1	1	1	
Class: Malacostraca							
Order: Amphipoda	1	281		42			
Phylum: Annelida							
Subphylum: Clitellata							
Class: Hirudinea							
Order: Rhynchobdellida							
Family: Glossiphoniidae							
<i>Helobdella stagnalis</i>	1						
Class: Oligochaeta							
Order: Lumbriculida							
Family: Lumbriculidae					35	118	11
<i>Lumbriculus</i>					40		
<i>Rhynchelmis</i>			3			1	
Order: Tubificida							
Family: Enchytraeidae							
<i>Enchytraeus</i>	19	25	53	4		2	44
Family: Naididae							
<i>Nais</i>		19	90				133
<i>Tubifex</i>							
Subfamily: Tubificinae without hair chaetae				2			
Totals:	459	2809	1120	451	255	299	3687
Diversity:	33	24	28	30	26	27	11
Taxa present but not included:							
Phylum: Arthropoda							
Subphylum: Crustacea							
Class: Ostracoda	1	6			1		
Class: Branchiopoda							
Order: Cladocera			3		1	1	
Class: Maxillipoda							
Class: Copepoda	1			1			
Phylum: Nemata	1					1	
Phylum: Platyhelminthes							
Class: Turbellaria						1	
Totals:	3	6	3	1	2	3	0

Sample: Sample Collection Date: SubSample %:	R-1 07-Sep-16 100	R-2 07-Sep-16 31	R-3 06-Sep-16 35	R-4 05-Sep-16 100	R-6 08-Sep-16 27
Phylum: Arthropoda					
Order: Collembola					
Family: Hypogastruridae	1			2	
Family: Sminthuridae					
Subphylum: Hexapoda					
Class: Insecta					
Order: Ephemeroptera					
Family: Ameletidae					
<u>Ameletus</u>					30
Family: Baetidae			3		
<u>Baetis</u>		6	57		
<u>Baetis tricaudatus group</u>			17		
Family: Ephemerellidae					
<u>Ephemerella</u>					
Family: Heptageniidae		116	3		19
<u>Cinygmula</u>		16			
<u>Rhithrogena</u>					7
Order: Plecoptera					
Family: Capniidae	36	394	74	80	933
Family: Chloroperlidae		26			
<u>Haploperla</u>		13			
Family: Leuctridae					
Family: Nemouridae	22	74	103	35	4
<u>Nemoura</u>			9	5	
<u>Ostrocerca</u>	9				
<u>Podmosta</u>			26	99	
<u>Zapada columbiana</u>		3			
Family: Perlodidae			3		
<u>Isoperla</u>					
Family: Taeniopterygidae					
<u>Taenionema</u>					
Order: Trichoptera					
Family: Apataniidae					
<u>Apatania</u>					
Family: Brachycentridae					
<u>Brachycentrus</u>					
<u>Brachycentrus americanus</u>					
Family: Glossosomatidae					
<u>Glossosoma</u>					
Family: Hydropsychidae					
Family: Limnephilidae		6			
<u>Ecclisomyia</u>					
Order: Diptera	2				
Family: Ceratopogonidae					
<u>Probezzia</u>					4
Family: Chironomidae	1		9		
Subfamily: Chironominae					
Tribe: Chironomini					
<u>Polypedilum</u>					
Tribe: Tanytarsini					
<u>Cladotanytarsus</u>					4
<u>Constempellina sp. C</u>		3			

Sample:	R-1	R-2	R-3	R-4	R-6
Sample Collection Date:	07-Sep-16	07-Sep-16	06-Sep-16	05-Sep-16	08-Sep-16
SubSample %:	100	31	35	100	27
<i>Micropsectra</i>					
<i>Paratanytarsus</i>	1				
<i>Stempellina</i>					19
<i>Tanytarsus</i>					11
Subfamily: Diamesinae					
<i>Pseudokiefferiella</i>				5	
Tribe: Diamesini					
<i>Diamesa</i>	2	87	3	1	
<i>Pagastia</i>		6	9		
<i>Pseudodiamesa</i>		3	3	3	
Subfamily: Orthocladiinae			3	1	
<i>Brillia</i>					
<i>Corynoneura</i>					
<i>Diplocladius</i>		6	26		4
<i>Eukiefferiella</i>	1	168	297	17	7
<i>Euryhapsis</i>					
<i>Hydrobaenus</i>	1				
<i>Hydrosmittia</i>					15
<i>Krenosmittia</i>					
<i>Limnophyes</i>	2	3	3		
<i>Metriocnemus</i>				1	
<i>Nanocladius</i>					
<i>Orthocladius complex</i>	1	13	169		63
<i>Parakiefferiella</i>			3		4
<i>Parametriocnemus</i>					
<i>Paraphaenocladius</i>		3	3		
<i>Parorthocladius</i>					
<i>Pseudosmittia</i>		3			
<i>Tvetenia</i>			11		4
Subfamily: Tanypodinae					
Tribe: Pentaneurini					
<i>Thienemannimyia group</i>		3			4
Family: Empididae		3			
<i>Neoplasta</i>					
<i>Trichoclinocera</i>					
Family: Muscidae					
<i>Limnophora</i>			3		
Family: Psychodidae					
<i>Pericoma/Telmatoscopus</i>		26	3		
Family: Simuliidae			3		
<i>Metacnephia</i>			6	1	
<i>Prosimulium</i>				1	
<i>Simulium</i>		68			
Family: Tabanidae					
<i>Tabanus</i>		3			
Family: Tipulidae					
<i>Dicranota</i>	1	23	9	2	4
<i>Gonomyodes</i>					
<i>Limnophila</i>					
Subphylum: Chelicerata					
Class: Arachnida					
Order: Trombidiformes					
Family: Lebertiidae					
<i>Lebertia</i>					
Family: Sperchontidae					

Sample: Sample Collection Date: SubSample %:	R-1 07-Sep-16 100	R-2 07-Sep-16 31	R-3 06-Sep-16 35 9	R-4 05-Sep-16 100	R-6 08-Sep-16 27
<u>Sperchon</u>					
Order: Sarcophagiformes					
Family: Hydrozetidae					
Class: Malacostraca					
Order: Amphipoda					
Phylum: Annelida					
Subphylum: Clitellata					
Class: Hirudinea					
Order: Rhynchobdellida					
Family: Glossiphoniidae					
<u>Helobdella stagnalis</u>					
Class: Oligochaeta					
Order: Lumbriculida					
Family: Lumbriculidae		71		1	22
<u>Lumbriculus</u>					
<u>Rhynchelmis</u>					
Order: Tubificida					
Family: Enchytraeidae					
<u>Enchytraeus</u>			26	3	
Family: Naididae					
<u>Nais</u>		3			37
<u>Tubifex</u>			6		7
Subfamily: Tubificinae without			3		
Totals:	80	1149	902	257	1202
Diversity:	13	27	30	16	20
Taxa present but not included:					
Phylum: Arthropoda					
Subphylum: Crustacea					
Class: Ostracoda		3	3	1	
Class: Branchiopoda					
Order: Cladocera					
Class: Maxillipoda					
Class: Copepoda			3		
Phylum: Nemata					
Phylum: Platyhelminthes					
Class: Turbellaria					
Totals:	0	3	6	1	0

APPENDIX F

FISH HABITAT AND ASSESSMENT DATA, 2016

**TABLE 21 LENGTHS (mm) OF LIVE SAMPLED FISH FROM MINNOW TRAPPING,
CLINTON CREEK, SEPTEMBER 2016**

Site	Juvenile Chinook Salmon	Arctic Grayling	Slimy Sculpin
Pool below Gabion Structures	81		
	87		
	93		
	94		
	89		
	96		
	91		
	81		
	98		
	102		
Average	91.2		
E1	94	97	109
	92	105	94
	96	97	93
	98	87	99
	103	102	85
	91	103	83
	72	91	87
	84	140	100
	101	92	88
	92	103	
	103	89	
	97		
	88		
	86		
	95		
	84		
	101		
	88		
	92		
	88		
Average at E1	92.3	100.5	93.1
	75		89
	82		75
	78		56
	86		102
	78		
	78		
	107		
	86		
	101		
	92		

E2	94		
	89		
	88		
	79		
	74		
	72		
	81		
	88		
	102		
	88		
	81		
	83		
	81		
	82		
	94		
	91		
	77		
	74		
	81		
	66		
	86		
	88		
	93		
Average at E2	84.7		80.5
E4	82		57
	75		63
	82		54
			73
			73
			99
			82
			78
			83
Average at E4	79.7		73.6
	62		72
	57		
	65		
	77		
	71		
	84		
	88		
	72		
	74		
	72		
	77		
	68		
	62		

E6	62		
	74		
	75		
	71		
	61		
	69		
	78		
	74		
	71		
	70		
	76		
	78		
	64		
	68		
	74		
	76		
	73		
	58		
	69		
	69		
	66		
	55		
Average at E6	70.3		72.0

Clinton Creek, Site Description, 2016

Site: E1 Clinton Creek, ford at mine site

Location: 513 684E 71 47 156N

Aspect: East

Site	Survey Date (dd/mm/yr)	06/09/16
	Site Elevation (ft)	1304'
	Site Survey Length (m)	120
Channel	Ave. Channel Width (m)	6.5
	Ave. Wetted Width (m)	5.1
	Ave. Bankfull Channel Depth (m)	1.05
	Ave. Residual Pool Depth (m)	0.5
	Pool, Riffle, Run / Glide	60 rapid, 35 riffle, 5 side/bldr pools
	Gradient (%)	<2%
Cover	Cover Abundance	Moderate
	Dominant Cover Type	Perched boulders and cobbles
	Subdominant Cover Type	Small boulder pools
	Other Cover Types Present	none
	% Crown Closure	0
	Stream side Vegetation	Occasional willow and poplar
	Instream Vegetation	none
Morphology	Dominant Bed Material	60% angular boulders
	Subdominant Bed Material	30% angular cobble
	D95 (cm)	803
	D (cm)	150
	Morphology	Rapid riffle channel
	Pattern	Gentle meanders
	Islands	none
	Bars	none
	Confinement	Entrenched within abrupt unconsolidated waste rock

FISH OBSERVATIONS:

15 minnow traps set at this site recorded an abundance of robust jcs, juvenile Arctic grayling and adult slimy sculpin were also well represented in the catches. Angling for 30 minutes captured no fish

COMMENTS: The access road to Hudgeon Lake fords Clinton Creek at this sample site. The ford requires semi constant maintenance and is utilized regularly by vehicle traffic resulting in the lower section of the sample reach having a more or less constant destabilization of the banks. The site cuts through old waste rock and the stream channel has not stabilized.

CREW: P. Sparling, M. Crill



CCE1 Photo 1: Looking across the ford through old tailings and waste rock at site E1 during September of 2016.



CCE1 Photo 2: Looking downstream from the ford at site E1 during September of 2016, note that the banks are unconsolidated and vegetation has not established along the creek banks.



CCE1 Photo 3: Looking upstream towards Hudgeon Lake during September 2016. The shifting waste rock piles and unconsolidated banks of the creek are very obvious in this photo.

Clinton Creek, Habitat and Site Description, 2016

Site: E-2, Clinton Creek upstream of Wolverine Creek

Location: 514 299E / 71 46901N

Aspect: East/south/east

Site	Survey Date	Sept. 6, 2016
	Site Elevation (ft)	1225'
	Site Survey Length (m)	160m
Channel	Ave. Channel Width (m)	13.0m
	Ave. Wetted Width (m)	7.5m
	Ave. Bankfull Channel Depth (m)	0.73m
	Ave. Depth	0.19
	%Pool, Riffle, Run / Glide	10 pool, 10 glide, 80 riffle
	Gradient (%) and velocity m/sec	>1% , 0.6m/sec
Cover	Cover Abundance	Moderate
	Dominant Cover Type	Undercut banks and corner pools
	Subdominant Cover Type	Perched boulders and cobbles
	Other Cover Types Present	Overhanging veg and woody debris
	% Crown Closure	<2%
	Stream side Vegetation	Alder and grass
	Instream Vegetation	Aquatic moss
Morphology	Dominant Bed Material	Gravel
	Subdominant Bed Material	Sand
	D95 (cm)	190cm
	D (cm)	7.5cm
	Morphology	Active channel downstream of old beaver pond
	Pattern	meandering
	Islands	Small and occasional
	Bars	Wide gravel bar corners
	Confinement	Open flood plain

FISH OBSERVATIONS: Angling effort of 50 minutes captured 2 adult Arctic grayling, a set of 10 minnow traps through the study reach captured a total of 65 jcs and 4 adult slimy sculpin.

COMMENTS: This sample site is located immediately downstream of an old and large beaver pond that washed out within the past 4 years, resulting in an open flood plain with wide gravel bars. Piles of woody debris are present at the high water mark.

CREW:

P. Sparling, M. Crill and D. Davidge



Photo 1, site E2: Wolverine Creek looking upstream at site E2, September 2016. A large beaver dam crossed the creek at the top of this photo during the 2007 investigations, the exposed gravel bar on the left is a residual from the wash out from the dam.



Photo 2, site E2: Looking downstream on Clinton Creek at E2, Wolverine Creek enters at the bottom corner of the flow from the left side.



Photo 3, site E2: Filamentous algae attached to typical substrates at site E2, September 2016.

Clinton Creek, Site Description, 2016

Site: Wolverine Creek, E-3

Location: 514 168E / 71 47 116N

Aspect: South

Site	Survey Date	September 6, 2016
	Site Elevation (ft)	1218'
	Site Survey Length (m)	200m
Channel	Ave. Channel Width (m)	6.7m
	Ave. Wetted Width (m)	4.2m
	Ave. Bankfull Channel Depth (m)	0.57m
	Ave. Depth (m)	0.12m
	% Pool, Riffle, Run / Glide	100% riffle
	Gradient (%) and velocity m/sec	1%, V= 0.54 m/sec
Cover	Cover Abundance	Limited
	Dominant Cover Type	Stream side vegetation
	Subdominant Cover Type	Leaf litter
	Other Cover Types Present	Occasional sticks
	% Crown Closure	>5%
	Stream side Vegetation	Young spruce and willow
Morphology	Instream Vegetation	None
	Dominant Bed Material	Gravel
	Subdominant Bed Material	Sand and fines (tailings)
	D95 (cm)	13.2 cm
	D (cm)	3.2 cm
	Morphology	Open flood plain, unstable banks
	Pattern	Sinuuous meandering
	Islands	Occasional
	Bars	In disturbed open areas
	Confinement	Partially entrenched upstream

FISH OBSERVATIONS: No fish were recorded at this site.

COMMENTS: Wolverine Creek carries large amounts of tailings that have been transported by the creek from the mill site upstream; the tailings represent the majority of the bed materials. The sample site encompasses an extensively modified habitat with proximity to the access roads and old mine workings.

CREW: D. Davidge, M. Crill



Photo 1 Wolverine Creek: Wolverine Creek on September 6, 2016, looking upstream. Gravel bars consisting of tailings carried down the creek by the creek are visible on both banks.



Photo 2 Wolverine Creek: Wolverine Creek, September 2016, looking downstream. The gate on the access road is visible in the mid left of the photo and old mine workings across Clinton Creek are visible in the background.



Photo 3 Wolverine Creek: Installing a temperature data logger on Wolverine Creek, September 2016. Wolverine creek becomes more confined and has deeper flows upstream of the sample area, the turbid water is an indication of high flow levels.

Clinton Creek, Site Description, 2016

Site: E-4 Clinton Creek upstream of Eagle Creek

Location: 515 853E / 71 45 206N

Aspect: East

Site	Survey Date	September 5, 2016
	Site Elevation (ft)	1143'
	Site Survey Length (m)	100m
Channel	Ave. Channel Width (m)	7.0m
	Ave. Wetted Width (m)	6.5m
	Ave. Bankfull Channel Depth (m)	1.05m
	Ave. Depth (m)	0.4m
	% Pool, Riffle, Run / Glide	90% riffle, 10% pool
	Gradient (%) and velocity m/sec	>1%, 1.2m/sec
Cover	Cover Abundance	moderate
	Dominant Cover Type	pools
	Subdominant Cover Type	boulders
	Other Cover Types Present	Cut banks
	% Crown Closure	>2%
	Stream side Vegetation	Alder, willow, young spruce
	Instream Vegetation	none
Morphology	Dominant Bed Material	gravel
	Subdominant Bed Material	Cobble and boulder
	D95 (cm)	419cm
	D (cm)	12cm
	Morphology	Stable channel with confining banks
	Pattern	sinuous
	Islands	None
	Bars	Sand at corner
	Confinement	Partially entrenched

FISH OBSERVATIONS: A set of 8 minnow traps captured 3 jcs and 8 adult slimy sculpin. Electro-fishing for 280 seconds recorded 8 slimy sculpin. Angling for 45 minutes captured 2 sub adult and 1 adult Arctic grayling.

COMMENTS: The sample reach is located immediately upstream of the confluence with Eagle Creek and has a mostly entrenched and straight channel. The water of Eagle Creek was very cold but as it enters Clinton Ck it creates a deep pool that held adult Arctic grayling

CREW: P. Sparling, M. Crill, B. Burns, D. Davidge



E-4 Photo 1: Looking upstream at the almost gunbarrel straight channel at site E4 during September 2016



E-4 Photo 2: Looking across the creek channel at site E4 during September 2016.



E-4 Photo 3: Looking downstream at site E4 during September 2015. Eagle Creek enters Clinton Creek just behind the sampler and before the creek makes the turn.

Clinton Creek, Site Description, 2016

Site: E-6, Clinton Creek near ford to Townsite

Location: 518 528E / 71 42 464N

Aspect: East by south east

Site	Survey Date	Sept. 5, 2016
	Site Elevation (ft)	1010'
	Site Survey Length (m)	120m
Channel	Ave. Channel Width (m)	11m
	Ave. Wetted Width (m)	13.5m
	Ave. Bankfull Channel Depth (m)	0.86m
	Ave. Depth (m)	0.25
	% Pool, Riffle, Run / Glide	60 glide, 30 riffle, 10 pool
	Gradient (%) and velocity m/sec	<1%, 0.7m/sec
Cover	Cover Abundance	Moderate
	Dominant Cover Type	Light turbidity
	Subdominant Cover Type	Undercut bank
	Other Cover Types Present	Instream woody debris
	% Crown Closure	2%
	Stream side Vegetation	Willow, alder, birch with mature spruce
	Instream Vegetation	none
Morphology	Dominant Bed Material	Gravel
	Subdominant Bed Material	Cobbles
	D95 (cm)	27.7cm
	D (cm)	12cm
	Morphology	Stable channel freshet flooding 0.6m
	Pattern	Gentle meander
	Islands	None
	Bars	Gravel point bars
	Confinement	1m bank opposite open becomes confined upstream of site

FISH OBSERVATIONS: A set of 14 minnow traps captured 35 jcs and 1 adult sculpin. Electro-fishing for 220 seconds captured 1 sub adult Arctic grayling, 1 juvenile Arctic grayling, 5 sub adult slimy sculpin and 1 adult slimy sculpin

COMMENTS: The downstream end of this reach is the ford across Clinton Creek used to access the local residence, the old bridge frame when the road went to the historic town site is still intact and just below the downstream end of the sample reach

CREW: P. Sparling, M. Crill



E-6 Photo 1: Looking across the ford at the downstream end of the ford at sample site R6 during September of 2016. The old bridge can be seen in the downstream area of the photo.



E-6 Photo 2: Looking upstream from the edge of the ford crossing at sample site R6 during September 2016.



E-6 Photo 3: The substrate at this site typically was loosely compacted and consisted of 50% gravel, 30% cobble, 20% fines and the occasional boulder.

Clinton Creek, Site Description, 2016

Site: R1 Upper Clinton Creek

Location: 510 597E / 71 47 494N

Aspect: South by South East

Site	Survey Date	September 7, 2016
	Site Elevation (ft)	1389'
	Site Survey Length (m)	100m
Channel	Ave. Channel Width (m)	7m
	Ave. Wetted Width (m)	6m
	Ave. Bankfull Channel Depth (m)	0.42m
	Ave. Depth (m)	0.20m
	% Pool, Riffle, Run / Glide	90% glide, 5% riffle, 5% pool
	Gradient (%) and velocity m/sec	>0, 0.5 m/sec
Cover	Cover Abundance	limited
	Dominant Cover Type	Stream side vegetation
	Subdominant Cover Type	Woody debris
	Other Cover Types Present	Light turbidity
	% Crown Closure	>1%
	Stream side Vegetation	Willow, grass and dead spruce
	Instream Vegetation	None
Morphology	Dominant Bed Material	Gravel
	Subdominant Bed Material	Sand
	D95 (cm)	3.5cm
	D (cm)	All
	Morphology	Shifting bedload in open flood plain
	Pattern	Sinuuous
	Islands	Occasional
	Bars	None
	Confinement	Banks rise 0.4 meters to open flood plain

FISH OBSERVATIONS: No fish were recorded at this site.

COMMENTS: This site is situated upstream of Hudgeon Lake and has a long shallow outflow area to the lake. The substrates in the sample reach were shifting at the time of investigation.

CREW: P. Sparling, M. Crill, B. Burns, D. Davidge



R1 Photo 1: Upper Clinton Creek looking upstream to the top of the sample reach, September 2016.



R1 Photo 2: Looking across the sample reach at R1, upper Clinton Creek during September 2016.



R1 Photo 3: Looking downstream at site R1, upper Clinton Creek.

Clinton Creek, Site Description, 2016

Site: R2 Easter Creek

Location: 512 139E / 71 48 297N

Aspect: South West

Site	Survey Date	September 7, 2015
	Site Elevation (ft)	1392'
	Site Survey Length (m)	55m
Channel	Ave. Channel Width (m)	4.2m
	Ave. Wetted Width (m)	2.2m
	Ave. Bankfull Channel Depth (m)	0.65
	Ave. Depth (m)	0.25m
	% Pool, Riffle, Run / Glide	80% riffle, 20% glide, occ. pool
	Gradient (%) and velocity m/sec	>1%, 0.68m/sec
Cover	Cover Abundance	Limited
	Dominant Cover Type	Tree roots
	Subdominant Cover Type	Cut banks
	Other Cover Types Present	
	% Crown Closure	5%
	Stream side Vegetation	Spruce, alder, cinquefoil
	Instream Vegetation	None
Morphology	Dominant Bed Material	Gravel
	Subdominant Bed Material	Sand
	D95 (cm)	9.3cm
	D (cm)	8 cm
	Morphology	Shifting channel
	Pattern	Meandering
	Islands	Occasional
	Bars	Corners have sand
	Confinement	Open flood plain

FISH OBSERVATIONS: No fish were recorded at this site

COMMENTS: This small creek had no fish present and does not provide any fish habitat of any size and would likely not have fish even if they were present in the area. During the sample period new areas of channel were being flooded and other areas left dry.

CREW: P. Sparling, M. Crill, B. Burns, D. Davidge



R2 Photo 1: Easter Creek, site R2, looking downstream at the sample site, September, 2016.



R2 Photo 2: Looking upstream from the sample site at R2, September, 2016.



R2 Photo 3: Measuring the flow at site R2, gravel deposition and flooded vegetation is visible in the photo.

Clinton Creek, Site Description, 2016

Site: R-4, Eagle Creek

Location: 62° / 136°

Aspect: South by South West

Site	Survey Date	September 5, 2016
	Site Elevation (ft)	
	Site Survey Length (m)	80m
Channel	Ave. Channel Width (m)	1.6m
	Ave. Wetted Width (m)	1.5m
	Ave. Bankfull Channel Depth (m)	2.0m
	Ave. Depth (m)	0.2m
	% Pool, Riffle, Run / Glide	100% riffle
	Gradient (%) and velocity m/sec	2%, 0.75 m/sec
Cover	Cover Abundance	None
	Dominant Cover Type	
	Subdominant Cover Type	
	Other Cover Types Present	
	% Crown Closure	80%
	Stream side Vegetation	Spruce, alder, willow
	Instream Vegetation	none
Morphology	Dominant Bed Material	Cobble
	Subdominant Bed Material	Gravel
	D95 (cm)	21cm
	D (cm)	Totally embedded
	Morphology	Straight and stable
	Pattern	Straight
	Islands	None
	Bars	None
	Confinement	Entrenched

FISH OBSERVATIONS:

No fish were observed in Eagle Creek, it does not provide for fish passage from Clinton Creek nor does it offer any cover or habitats for fish.

COMMENTS: Eagle Creek has a straight, featureless channel that outflows to Clinton Creek through a perched culvert that does not allow fish passage.

CREW: P. Sparling, B. Burns, M. Crill, D. Davidge



Eagle Creek Photo 1: Eagle Creek is a narrow entrenched channel with a well embedded substrate. September 2016.



Eagle Creek Photo 2: An old bridge crossing that parallels the existing road still spans Eagle Creek.

Clinton Creek, Site Description, 2016

Site: Maiden Creek

Location: 518 312 E / 71 39 251 N

Aspect: North

Site	Survey Date	September 9, 2016
	Site Elevation (ft)	1080'
	Site Survey Length (m)	300m
Channel	Ave. Channel Width (m)	8.0m
	Ave. Wetted Width (m)	3.2m
	Ave. Bankfull Channel Depth (m)	1.35m
	Ave. Depth (m)	0.6m
	% Pool, Riffle, Run / Glide	60 riffle, 20 glide, 10 rapid, 10 eddy
	Gradient (%) and velocity m/sec	
Cover	Cover Abundance	Abundant
	Dominant Cover Type	LOD
	Subdominant Cover Type	Undercut banks
	Other Cover Types Present	Overhanging vegetation
	% Crown Closure	>5%
	Stream side Vegetation	Birch, alder, mat spruce
	Instream Vegetation	None
Morphology	Dominant Bed Material	Silt and sand
	Subdominant Bed Material	Gravel
	D95 (cm)	17cm
	D (cm)	12cm
	Morphology	Confined and stable
	Pattern	Meandering
	Islands	Occasional
	Bars	On points
	Confinement	Partially entrenched

FISH OBSERVATIONS: No fish were recorded at this site, electrofishing and minnow traps captured no fish.

COMMENTS: Maiden Creek was very cold at the time of sampling and frazzle ice was present in the moving water. Active placer mining occurred on Maiden Creek during the 2016 season within 500 meters of the sample station, although the mining was off channel flows were diverted to the sluicing area and back to the creek.

CREW: P. Sparling, M. Crill



Maiden Ck Photo 1: Maiden Creek, September, 2015 looking at the upper area of the sample reach.



Maiden Ck Photo 2: The downstream section of the sample reach on Maiden Creek, September 2016. Note the entrenchment on the opposite bank.



Maiden Ck Photo 3: Looking upstream of the sample reach on Maiden Creek, September 2016. This photo shows the large amounts of woody debris present in the sample area.



Maiden Ck Photo 4: Looking downstream during September, 2016 from the bridge accessing the placer claims. The area to the left of the creek was mined in previous years and the channel has been constructed.

APPENDIX G
TISSUE ANALYTICAL DATA, 2016

TABLE 24 **DETAILS ON THE SACRIFICED FISH, CLINTON CREEK, 2016**

Sample #	Sample Type	Length (mm)	Weight(g)	Sample Site	Condition Factor (K)	Total Homogenized Weight wet (g)	% Moisture	Sex and Maturity
Slimy Sculpin								
SS1	Whole body	92	8.1	E2	1.0	6.221	74.3	
SS2	Whole body	99	13.45	E4	1.4	10.998	72.7	
SS3	Whole body	73	4.2	E4	1.1	3.164	71.1	
SS4	Whole body	82	4.89	E4	0.9	3.758	73.2	
SS5	Whole body	79	3.75	E4	0.8	2.97	73.8	
SS6	Whole body	75	3.89	E4	0.9	2.938	73.6	
SS7	Whole body	81	6.1	E4	1.1	4.513	76.0	
SS8	Whole body	75	3.6	E4	0.9	5.46	73.4	
SS9	Whole body	71	3.1	E6	0.9	2.332	76.4	
SS10	Whole body	70	2.9	E6	0.8	2.209	77.4	
SS11	Whole body	86	7.71	E1	1.2	5.89	72.8	
SS12	Whole body	81	6.19	E1	1.2	4.547	72.0	
SS13	Whole body	91	9.51	E1	1.3	8.164	75.1	
SS14	Whole body	109	16.95	E1	1.3	15.091	74.9	
SS15	Whole body	85	6.37	E1	1.0	5.141	75.5	
SS16	Whole body	80	5.75	E1	1.1	4.54	75.4	
SS17	Whole body	91	9.08	E1	1.2	7.459	73.7	
SS18	Whole body	103	13.31	E1	1.2	11.356	74.6	
SS19	Whole body	100	10.72	E1	1.1	8.624	73.3	
SS20	Whole body	74	4.24	E1	1.0	3.057	72.3	
SS21	Whole body	99	12.1	E1	1.2	8.934	73.0	
SS22	Whole body	74	4.41	E1	1.1	3.232	70.7	
SS23	Whole body	65	2.66	E2	1.0	1.884	73.8	
SS24	Whole body	76	4.92	E2	1.1	3.66	72.9	
SS25	Whole body	82	5.43	E2	1.0	4.115	73.7	
SS26	Whole body	97	9.04	E2	1.0	6.812	76.6	
SS27	Whole body	73	4.16	E2	1.1	3.199	74.1	
SS28	Whole body	87	6.69	E2	1.0	2.691	76.4	
SS29	Whole body	85	5.94	E2	1.0	4.702	71.7	
SS30	Whole body	81	5.61	E2	1.1	4.383	70.8	
Arctic Grayling								
Ag 1	Liver	351	440	G pool*	1.0	3.395	69.1	mature male
Ag 1	Muscle					103.318	74.4	
Ag 2	Liver	220	120	G pool	1.1	0.82	69.1	immature female
Ag 2	Muscle					49.715	69.5	
Ag 3	Liver	245	140	G pool	1.0	0.982	59.9	mature male
Ag 3	Muscle					62.876	66.9	
Ag 4	Liver	268	210	G pool	1.1	2.389	60.2	mature male
Ag 4	Muscle					82.98	70.6	
Ag 5	Liver	291	265	G pool	1.1	3.224	75.9	mature female
Ag 5	Muscle					91.732	71.2	
Ag 6	Liver	252	170	G pool	1.1	2.061	60.9	mature female
Ag 6	Muscle					74.543	71.4	
Ag 7	Liver	286	258	G pool	1.1	2.129	55.8	mature male
Ag 7	Muscle					89.226	69.9	
Ag 8	Liver	178	58	G pool	1.0	0.57	71.3	immature male
Ag 8	Muscle					34.483	71.6	
Ag 9	Liver	164	48	G pool	1.1	0.548	71.7	immature male
Ag 9	Muscle					28.798	73.0	
Ag 10	Liver	177	57	G pool	1.0	0.615	65.5	immature male
Ag 10	Muscle					33.493	72.5	
Ag 11	Liver	169	46	G pool	1.0	0.781	74.4	immature male
Ag 11	Muscle					27.845	72.1	
Ag 12	Liver	162	44	G pool	1.0	0.399	74.2	immature female
Ag 12	Muscle					24.59	72.9	
Ag 13	Liver	181	51	G pool	0.9	0.61	76.3	immature male
Ag 13	Muscle					28.771	75.5	
Ag 14	Liver	207	81	G pool	0.9	0.978	78.8	immature male
Ag 14	Muscle					44.762	74.0	
Ag 15	Liver	325	375	E2	1.1	2.907	61.7	mature male
Ag 15	Muscle					111.127	70.4	
*G pool = Pool below Gabion structure								

TABLE 26 CONVERTED WET WEIGHTS FOR SELECTED METALS IN SCULPIN TISSUES

Site	Arsenic (ug/g)	Cadmium (ug/g)	Chromium (ug/g)	Copper (ug/g)	Iron (ug/g)	Lead (ug/g)	Maganese (ug/g)	Mercury (ug/g)	nickel (ug/g)	Selenium (ug/g)	Zinc (ug/g)
E1	0.08	0.02	0.15	0.7	42.43	0.05	11.34	0.12	0.45	1.6	29.1
E1	0.08	0.04	0.1	0.53	35.84	0.11	22.88	0.11	0.28	1.39	32.48
E1	0.12	0.04	1.43	0.85	104.08	0.06	19.67	0.08	2.54	1.87	28.14
E1	0.08	0.03	0.17	0.71	73.04	0.06	17.34	0.09	0.42	1.79	26.1
E1	0.15	0.05	0.38	1.12	126.18	0.09	30.38	0.1	1.01	1.63	34.55
E1	0.06	0.02	0.06	0.71	27.55	0.29	11.46	0.07	0.18	1.45	19.63
E1	0.08	0.06	0.26	0.75	67.33	0.06	38.66	0.06	0.58	2.04	32.09
E1	0.15	0.03	0.68	0.76	80.01	0.02	25.65	0.08	4.24	1.2	21.64
E1	0.06	0.03	0.11	0.66	41.12	0.04	22.11	0.06	0.26	1.55	23.36
E1	0.11	0.07	0.37	0.65	75.62	0.05	25.37	0.07	0.83	1.13	19.17
E1	0.16	0.05	0.77	0.96	150.66	0.07	33.21	0.12	1.49	1.76	26.43
E1	0.12	0.04	0.45	0.91	97.57	0.06	17.08	0.04	0.72	1.31	19.31
Mean	0.1	0.04	0.41	0.78	76.79	0.08	22.93	0.08	1.08	1.56	26
SD	0.04	0.01	0.39	0.16	37.83	0.07	8.34	0.03	1.19	0.28	5.43
E2	0.08	0.03	0.15	0.62	43.69	0.11	12.72	0.07	0.36	1.85	23.62
E2	0.07	0.02	<0.05	0.47	19.55	<0.01	5.34	0.06	0.16	1.06	23.74
E2	0.05	0.03	<0.05	0.57	18.48	<0.01	10.46	0.08	0.25	1.26	19.7
E2	0.08	0.03	0.08	0.51	32.61	0.01	10.94	0.07	0.33	1.35	18.8
E2	0.06	0.02	0.07	0.69	28.78	0.02	13.5	0.09	0.18	1.54	28.55
E2	0.07	0.08	<0.05	0.59	32.12	0.03	30.3	0.04	0.19	1.79	24.61
E2	0.09	0.03	0.09	0.45	26.67	0.03	11.23	0.14	0.31	1.29	28.08
E2	0.13	0.03	0.19	0.93	121.69	0.07	8.21	0.13	0.69	1.51	23.21
E2	0.09	0.04	0.06	0.61	26.48	0.03	12.7	0.09	0.44	1.65	23.62
Mean	0.08	0.03	0.1	0.6	38.9	0.04	12.82	0.08	0.32	1.48	23.77
SD	0.02	0.02	0.05	0.14	31.94	0.03	7.03	0.03	0.16	0.26	3.23
E4	0.04	0.02	0.02	0.64	18.13	0.05	11.66	0.06	0.07	1.36	18.54
E4	0.09	0.03	<0.06	0.52	22.17	0.05	14.07	0.05	0.17	1.2	22.25
E4	0.08	0.05	0.11	0.58	18.97	0.07	10.85	0.07	0.28	1.31	34.84
E4	0.11	0.05	0.19	0.55	49.26	0.07	20.62	0.14	1.17	1.46	36.42
E4	0.18	0.03	0.09	0.76	26.93	0.05	8.47	0.12	0.35	1.61	24.9
E4	0.08	0.02	0.12	0.56	29.52	0.04	18.94	0.13	0.53	1.46	29.76
E4	0.07	0.02	0.13	0.72	32.19	0.01	12.4	0.05	0.37	1.74	19.23
Mean	0.09	0.03	0.11	0.62	28.17	0.05	13.86	0.09	0.42	1.45	26.56
SD	0.04	0.01	0.06	0.09	10.69	0.02	4.41	0.04	0.36	0.18	7.25
E6	0.17	0.05	0.11	0.63	61.36	0.09	14.75	0.14	0.65	1.32	33.51
E6	0.12	0.03	0.14	0.63	54.92	0.05	14.87	0.11	0.68	1.31	27.57
Mean	0.14	0.04	0.12	0.63	58.14	0.07	14.81	0.13	0.66	1.32	30.54
SD	0.03	0.01	0.02	0	4.56	0.02	0.09	0.02	0.03	0.01	4.2

TABLE 27 CONVERTED WET WEIGHTS FOR SELECTED METALS IN ARCTIC GRAYLING TISSUES

Site	Arsenic (ug/g)	Cadmium (ug/g)	Chromium (ug/g)	Copper (ug/g)	Iron (ug/g)	Lead (ug/g)	Maganese (ug/g)	Mercury (ug/g)	nickel (ug/g)	Selenium (ug/g)	Zinc (ug/g)
E1	0.08	0.02	0.15	0.7	42.43	0.05	11.34	0.12	0.45	1.6	29.1
E1	0.08	0.04	0.1	0.53	35.84	0.11	22.88	0.11	0.28	1.39	32.48
E1	0.12	0.04	1.43	0.85	104.08	0.06	19.67	0.08	2.54	1.87	28.14
E1	0.08	0.03	0.17	0.71	73.04	0.06	17.34	0.09	0.42	1.79	26.1
E1	0.15	0.05	0.38	1.12	126.18	0.09	30.38	0.1	1.01	1.63	34.55
E1	0.06	0.02	0.06	0.71	27.55	0.29	11.46	0.07	0.18	1.45	19.63
E1	0.08	0.06	0.26	0.75	67.33	0.06	38.66	0.06	0.58	2.04	32.09
E1	0.15	0.03	0.68	0.76	80.01	0.02	25.65	0.08	4.24	1.2	21.64
E1	0.06	0.03	0.11	0.66	41.12	0.04	22.11	0.06	0.26	1.55	23.36
E1	0.11	0.07	0.37	0.65	75.62	0.05	25.37	0.07	0.83	1.13	19.17
E1	0.16	0.05	0.77	0.96	150.66	0.07	33.21	0.12	1.49	1.76	26.43
E1	0.12	0.04	0.45	0.91	97.57	0.06	17.08	0.04	0.72	1.31	19.31
Mean	0.1	0.04	0.41	0.78	76.79	0.08	22.93	0.08	1.08	1.56	26
SD	0.04	0.01	0.39	0.16	37.83	0.07	8.34	0.03	1.19	0.28	5.43
E2	0.08	0.03	0.15	0.62	43.69	0.11	12.72	0.07	0.36	1.85	23.62
E2	0.07	0.02	<0.05	0.47	19.55	<0.01	5.34	0.06	0.16	1.06	23.74
E2	0.05	0.03	<0.05	0.57	18.48	<0.01	10.46	0.08	0.25	1.26	19.7
E2	0.08	0.03	0.08	0.51	32.61	0.01	10.94	0.07	0.33	1.35	18.8
E2	0.06	0.02	0.07	0.69	28.78	0.02	13.5	0.09	0.18	1.54	28.55
E2	0.07	0.08	<0.05	0.59	32.12	0.03	30.3	0.04	0.19	1.79	24.61
E2	0.09	0.03	0.09	0.45	26.67	0.03	11.23	0.14	0.31	1.29	28.08
E2	0.13	0.03	0.19	0.93	121.69	0.07	8.21	0.13	0.69	1.51	23.21
E2	0.09	0.04	0.06	0.61	26.48	0.03	12.7	0.09	0.44	1.65	23.62
Mean	0.08	0.03	0.1	0.6	38.9	0.04	12.82	0.08	0.32	1.48	23.77
SD	0.02	0.02	0.05	0.14	31.94	0.03	7.03	0.03	0.16	0.26	3.23
E4	0.04	0.02	0.02	0.64	18.13	0.05	11.66	0.06	0.07	1.36	18.54
E4	0.09	0.03	<0.06	0.52	22.17	0.05	14.07	0.05	0.17	1.2	22.25
E4	0.08	0.05	0.11	0.58	18.97	0.07	10.85	0.07	0.28	1.31	34.84
E4	0.11	0.05	0.19	0.55	49.26	0.07	20.62	0.14	1.17	1.46	36.42
E4	0.18	0.03	0.09	0.76	26.93	0.05	8.47	0.12	0.35	1.61	24.9
E4	0.08	0.02	0.12	0.56	29.52	0.04	18.94	0.13	0.53	1.46	29.76
E4	0.07	0.02	0.13	0.72	32.19	0.01	12.4	0.05	0.37	1.74	19.23
Mean	0.09	0.03	0.11	0.62	28.17	0.05	13.86	0.09	0.42	1.45	26.56
SD	0.04	0.01	0.06	0.09	10.69	0.02	4.41	0.04	0.36	0.18	7.25
E6	0.17	0.05	0.11	0.63	61.36	0.09	14.75	0.14	0.65	1.32	33.51
E6	0.12	0.03	0.14	0.63	54.92	0.05	14.87	0.11	0.68	1.31	27.57
Mean	0.14	0.04	0.12	0.63	58.14	0.07	14.81	0.13	0.66	1.32	30.54
SD	0.03	0.01	0.02	0	4.56	0.02	0.09	0.02	0.03	0.01	4.2



LABERGE ENVIRONMENTAL
ATTN: Bonnie Burns
PO Box 21072
Whitehorse YT Y1A 6P7

Date Received: 13-SEP-16
Report Date: 18-OCT-16 18:10 (MT)
Version: FINAL

Client Phone: 867-668-6838

Certificate of Analysis

Lab Work Order #: L1829583
Project P.O. #: NOT SUBMITTED
Job Reference: CLINTON CREEK
C of C Numbers: 14-470934, 14-470935, 14-470936, 14-470937, 14-470938
Legal Site Desc:

Brent Mack, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

18-OCT-16 18:10 (MT)

Version: FINAL

Sample ID Description Sampled Date Sampled Time Client ID		L1829583-1 TISSUE 06-SEP-16 SS1	L1829583-2 TISSUE 06-SEP-16 SS2	L1829583-3 TISSUE 06-SEP-16 SS3	L1829583-4 TISSUE 06-SEP-16 SS4	L1829583-5 TISSUE 06-SEP-16 SS5
Grouping	Analyte					
TISSUE						
Physical Tests	% Moisture (%)	74.3	72.7	71.1	73.2	73.8
Metals	Aluminum (Al)-Total (mg/kg)	34.5	9.5	11.9	14.3	33.2
	Antimony (Sb)-Total (mg/kg)	0.095	0.014	0.121	0.496	0.076
	Arsenic (As)-Total (mg/kg)	0.301	0.156	0.306	0.285	0.430
	Barium (Ba)-Total (mg/kg)	5.69	4.43	6.08	11.3	12.3
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.128	0.0589	0.106	0.198	0.196
	Calcium (Ca)-Total (mg/kg)	52200	41700	44500	66700	75900
	Cesium (Cs)-Total (mg/kg)	0.373	0.0649	0.363	0.514	0.705
	Chromium (Cr)-Total (mg/kg)	0.573	0.056	<0.20	0.40	0.72
	Cobalt (Co)-Total (mg/kg)	0.219	0.070	0.088	0.081	0.360
	Copper (Cu)-Total (mg/kg)	2.42	2.34	1.81	2.15	2.10
	Iron (Fe)-Total (mg/kg)	170	66.4	76.7	70.8	188
	Lead (Pb)-Total (mg/kg)	0.438	0.173	0.182	0.278	0.253
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	1410	1340	1320	1720	2230
	Manganese (Mn)-Total (mg/kg)	49.5	42.7	48.7	40.5	78.7
	Mercury (Hg)-Total (mg/kg)	0.280	0.229	0.174	0.264	0.517
	Molybdenum (Mo)-Total (mg/kg)	0.088	0.063	0.063	0.060	0.087
	Nickel (Ni)-Total (mg/kg)	1.39	0.27	0.60	1.05	4.48
	Phosphorus (P)-Total (mg/kg)	29300	30500	30900	43300	46800
	Potassium (K)-Total (mg/kg)	9410	10600	8820	9450	8620
	Rubidium (Rb)-Total (mg/kg)	2.23	1.09	1.77	2.89	3.31
	Selenium (Se)-Total (mg/kg)	7.19	4.98	4.15	4.87	5.58
	Sodium (Na)-Total (mg/kg)	3800	4210	3590	3760	4820
	Strontium (Sr)-Total (mg/kg)	78.7	52.8	65.1	96.5	120
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0279	0.0194	0.0248	0.0360	0.0362
	Tin (Sn)-Total (mg/kg)	0.26	0.18	<0.10	0.18	<0.10
	Uranium (U)-Total (mg/kg)	0.0127	0.0087	0.0133	0.0325	0.0711
	Vanadium (V)-Total (mg/kg)	0.43	0.24	0.39	0.99	1.28
	Zinc (Zn)-Total (mg/kg)	91.9	67.9	77.0	130	139
	Zirconium (Zr)-Total (mg/kg)	0.25	<0.20	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829583-6 TISSUE 06-SEP-16 SS6	L1829583-7 TISSUE 06-SEP-16 SS7	L1829583-8 TISSUE 06-SEP-16 SS8	L1829583-9 TISSUE 06-SEP-16 SS9	L1829583-10 TISSUE 06-SEP-16 SS10
Grouping	Analyte					
TISSUE						
Physical Tests	% Moisture (%)	73.6	76.0	73.4	76.4	77.4
Metals	Aluminum (Al)-Total (mg/kg)	18.8	18.0	16.7	92.4	69.1
	Antimony (Sb)-Total (mg/kg)	0.035	0.028	0.015	0.090	0.107
	Arsenic (As)-Total (mg/kg)	0.676	0.317	0.257	0.714	0.531
	Barium (Ba)-Total (mg/kg)	8.72	8.94	4.99	13.5	12.1
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.129	0.093	0.0883	0.216	0.142
	Calcium (Ca)-Total (mg/kg)	55500	65500	39600	70700	57500
	Cesium (Cs)-Total (mg/kg)	0.804	0.914	0.163	0.831	0.988
	Chromium (Cr)-Total (mg/kg)	0.34	0.48	0.500	0.45	0.60
	Cobalt (Co)-Total (mg/kg)	0.185	0.203	0.174	0.417	0.347
	Copper (Cu)-Total (mg/kg)	2.88	2.35	2.69	2.66	2.79
	Iron (Fe)-Total (mg/kg)	102	123	121	260	243
	Lead (Pb)-Total (mg/kg)	0.177	0.153	0.052	0.364	0.227
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	1640	1830	1430	1780	1770
	Manganese (Mn)-Total (mg/kg)	32.1	78.9	46.6	62.5	65.8
	Mercury (Hg)-Total (mg/kg)	0.459	0.533	0.179	0.612	0.492
	Molybdenum (Mo)-Total (mg/kg)	0.062	0.139	0.060	0.119	0.081
	Nickel (Ni)-Total (mg/kg)	1.33	2.20	1.39	2.74	3.02
	Phosphorus (P)-Total (mg/kg)	36200	39300	29000	42700	38100
	Potassium (K)-Total (mg/kg)	9320	10700	10500	10500	10200
	Rubidium (Rb)-Total (mg/kg)	4.34	3.89	1.68	7.00	5.92
	Selenium (Se)-Total (mg/kg)	6.09	6.09	6.54	5.60	5.79
	Sodium (Na)-Total (mg/kg)	4180	4730	4190	4670	4590
	Strontium (Sr)-Total (mg/kg)	89.6	99.2	53.7	110	93.0
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0400	0.0338	0.0224	0.0354	0.0304
	Tin (Sn)-Total (mg/kg)	0.14	0.22	1.67	0.27	0.28
	Uranium (U)-Total (mg/kg)	0.0249	0.0306	0.0115	0.0787	0.0355
	Vanadium (V)-Total (mg/kg)	0.63	1.00	0.22	1.40	0.97
	Zinc (Zn)-Total (mg/kg)	94.3	124	72.3	142	122
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	<0.20	0.33	0.21

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829583-11 TISSUE 07-SEP-16 SS11	L1829583-12 TISSUE 07-SEP-16 SS12	L1829583-13 TISSUE 07-SEP-16 SS13	L1829583-14 TISSUE 07-SEP-16 SS14	L1829583-15 TISSUE 07-SEP-16 SS15
Grouping	Analyte					
TISSUE						
Physical Tests	% Moisture (%)	72.8	72.0	75.1	74.9	75.5
Metals	Aluminum (Al)-Total (mg/kg)	30.8	22.2	77.5	47.7	135
	Antimony (Sb)-Total (mg/kg)	0.023	0.036	0.074	0.032	0.069
	Arsenic (As)-Total (mg/kg)	0.298	0.303	0.491	0.309	0.603
	Barium (Ba)-Total (mg/kg)	5.91	8.03	9.65	6.56	19.4
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.0749	0.155	0.141	0.132	0.187
	Calcium (Ca)-Total (mg/kg)	45700	51000	39700	42600	74700
	Cesium (Cs)-Total (mg/kg)	0.259	0.254	0.214	0.0686	0.225
	Chromium (Cr)-Total (mg/kg)	0.545	0.34	5.74	0.670	1.54
	Cobalt (Co)-Total (mg/kg)	0.163	0.133	0.640	0.239	0.523
	Copper (Cu)-Total (mg/kg)	2.58	1.90	3.41	2.82	4.58
	Iron (Fe)-Total (mg/kg)	156	128	418	291	515
	Lead (Pb)-Total (mg/kg)	0.174	0.375	0.242	0.220	0.348
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	1460	1520	1890	1500	2240
	Manganese (Mn)-Total (mg/kg)	41.7	81.7	79.0	69.1	124
	Mercury (Hg)-Total (mg/kg)	0.436	0.400	0.319	0.353	0.420
	Molybdenum (Mo)-Total (mg/kg)	0.083	0.063	0.140	0.085	0.172
	Nickel (Ni)-Total (mg/kg)	1.66	1.00	10.2	1.69	4.14
	Phosphorus (P)-Total (mg/kg)	31000	32800	31100	31700	47400
	Potassium (K)-Total (mg/kg)	9350	9500	11600	11700	11900
	Rubidium (Rb)-Total (mg/kg)	1.37	2.07	2.05	1.83	1.95
	Selenium (Se)-Total (mg/kg)	5.88	4.97	7.50	7.14	6.65
	Sodium (Na)-Total (mg/kg)	3760	3810	4650	4530	4650
	Strontium (Sr)-Total (mg/kg)	70.7	76.6	57.6	57.2	114
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0208	0.0327	0.0565	0.0349	0.0312
	Tin (Sn)-Total (mg/kg)	0.12	0.11	0.16	0.12	0.22
	Uranium (U)-Total (mg/kg)	0.0260	0.0255	0.0316	0.0353	0.0554
	Vanadium (V)-Total (mg/kg)	0.44	0.94	0.80	0.53	0.99
	Zinc (Zn)-Total (mg/kg)	107	116	113	104	141
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	0.24	<0.20	0.45

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829583-16 TISSUE 07-SEP-16 SS16	L1829583-17 TISSUE 07-SEP-16 SS17	L1829583-18 TISSUE 07-SEP-16 SS18	L1829583-19 TISSUE 07-SEP-16 SS19	L1829583-20 TISSUE 07-SEP-16 SS20
Grouping	Analyte					
TISSUE						
Physical Tests	% Moisture (%)	75.4	73.7	74.6	73.3	72.3
Metals	Aluminum (Al)-Total (mg/kg)	20.3	53.6	87.1	23.7	92.8
	Antimony (Sb)-Total (mg/kg)	0.013	0.049	0.065	0.021	0.054
	Arsenic (As)-Total (mg/kg)	0.246	0.304	0.606	0.219	0.393
	Barium (Ba)-Total (mg/kg)	5.74	13.2	6.24	7.87	9.71
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.085	0.227	0.109	0.0984	0.244
	Calcium (Ca)-Total (mg/kg)	32700	54700	31500	40300	34400
	Cesium (Cs)-Total (mg/kg)	0.249	0.176	0.0644	0.0624	0.217
	Chromium (Cr)-Total (mg/kg)	0.25	1.00	2.69	0.409	1.34
	Cobalt (Co)-Total (mg/kg)	0.141	0.389	0.688	0.175	0.446
	Copper (Cu)-Total (mg/kg)	2.88	2.84	3.01	2.48	2.36
	Iron (Fe)-Total (mg/kg)	112	256	315	154	273
	Lead (Pb)-Total (mg/kg)	1.17	0.221	0.075	0.151	0.177
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	1330	1710	4140	1500	1370
	Manganese (Mn)-Total (mg/kg)	46.6	147	101	82.8	91.6
	Mercury (Hg)-Total (mg/kg)	0.273	0.237	0.315	0.210	0.243
	Molybdenum (Mo)-Total (mg/kg)	0.055	0.126	0.041	0.069	0.116
	Nickel (Ni)-Total (mg/kg)	0.75	2.20	16.7	0.96	2.98
	Phosphorus (P)-Total (mg/kg)	24200	38500	28500	31400	23400
	Potassium (K)-Total (mg/kg)	11000	11100	11000	10700	8530
	Rubidium (Rb)-Total (mg/kg)	1.92	1.88	1.85	1.33	1.59
	Selenium (Se)-Total (mg/kg)	5.88	7.76	4.72	5.79	4.09
	Sodium (Na)-Total (mg/kg)	3890	4280	4390	4090	3200
	Strontium (Sr)-Total (mg/kg)	47.9	81.2	48.2	55.4	53.6
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0236	0.0404	0.0216	0.0284	0.0233
	Tin (Sn)-Total (mg/kg)	0.17	0.15	0.10	<0.10	0.11
	Uranium (U)-Total (mg/kg)	0.0151	0.0214	0.0117	0.0104	0.0295
	Vanadium (V)-Total (mg/kg)	0.36	0.76	0.84	0.37	0.60
	Zinc (Zn)-Total (mg/kg)	79.8	122	85.2	87.5	69.2
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	0.29

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829583-21 TISSUE 07-SEP-16 SS21	L1829583-22 TISSUE 07-SEP-16 SS22	L1829583-23 TISSUE 07-SEP-16 SS23	L1829583-24 TISSUE 07-SEP-16 SS24	L1829583-25 TISSUE 07-SEP-16 SS25
Grouping	Analyte					
TISSUE						
Physical Tests	% Moisture (%)	73.0	70.7	73.8	72.9	73.7
Metals	Aluminum (Al)-Total (mg/kg)	123	133	8.1	5.1	21.0
	Antimony (Sb)-Total (mg/kg)	0.076	0.046	0.013	0.092	0.013
	Arsenic (As)-Total (mg/kg)	0.575	0.413	0.259	0.200	0.300
	Barium (Ba)-Total (mg/kg)	15.2	8.81	7.22	6.18	6.18
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.176	0.123	0.073	0.095	0.114
	Calcium (Ca)-Total (mg/kg)	48700	38000	38600	45400	37200
	Cesium (Cs)-Total (mg/kg)	0.212	0.355	0.767	0.586	0.782
	Chromium (Cr)-Total (mg/kg)	2.84	1.52	<0.20	<0.20	0.29
	Cobalt (Co)-Total (mg/kg)	0.596	0.295	0.099	0.066	0.169
	Copper (Cu)-Total (mg/kg)	3.54	3.11	1.81	2.09	1.94
	Iron (Fe)-Total (mg/kg)	558	333	74.6	68.2	124
	Lead (Pb)-Total (mg/kg)	0.265	0.221	<0.050	<0.050	0.056
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	1790	1360	1370	1520	1350
	Manganese (Mn)-Total (mg/kg)	123	58.3	20.4	38.6	41.6
	Mercury (Hg)-Total (mg/kg)	0.449	0.153	0.226	0.279	0.249
	Molybdenum (Mo)-Total (mg/kg)	0.168	0.142	0.060	0.059	0.072
	Nickel (Ni)-Total (mg/kg)	5.51	2.45	0.60	0.92	1.24
	Phosphorus (P)-Total (mg/kg)	32500	25800	27600	31500	26300
	Potassium (K)-Total (mg/kg)	9620	8460	9840	9560	10000
	Rubidium (Rb)-Total (mg/kg)	1.71	2.25	3.19	2.57	3.42
	Selenium (Se)-Total (mg/kg)	6.52	4.47	4.06	4.66	5.15
	Sodium (Na)-Total (mg/kg)	4050	2890	3860	3540	3600
	Strontium (Sr)-Total (mg/kg)	78.5	52.8	53.7	72.1	58.7
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0389	0.0309	0.0269	0.0211	0.0276
	Tin (Sn)-Total (mg/kg)	0.14	<0.10	0.19	<0.10	0.17
	Uranium (U)-Total (mg/kg)	0.0584	0.0242	0.0072	0.0179	0.0179
	Vanadium (V)-Total (mg/kg)	0.97	0.70	0.24	0.27	0.28
	Zinc (Zn)-Total (mg/kg)	97.9	65.9	90.6	72.7	71.5
	Zirconium (Zr)-Total (mg/kg)	0.36	0.35	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L1829583-26 TISSUE 07-SEP-16 SS26	L1829583-27 TISSUE 07-SEP-16 SS27	L1829583-28 TISSUE 07-SEP-16 SS28	L1829583-29 TISSUE 07-SEP-16 SS29	L1829583-30 TISSUE 07-SEP-16 SS30
Grouping	Analyte						
TISSUE							
Physical Tests	% Moisture (%)		76.6	74.1	76.4	71.7	70.8
Metals	Aluminum (Al)-Total (mg/kg)		12.0	14.1	18.1	52.2	11.4
	Antimony (Sb)-Total (mg/kg)		0.023	0.021	0.379	0.031	0.016
	Arsenic (As)-Total (mg/kg)		0.253	0.287	0.382	0.466	0.292
	Barium (Ba)-Total (mg/kg)		7.71	10.7	8.33	7.98	7.25
	Beryllium (Be)-Total (mg/kg)		<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)		<0.010	<0.010	<0.010	<0.010	<0.010
	Boron (B)-Total (mg/kg)		<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)		0.0933	0.310	0.140	0.109	0.134
	Calcium (Ca)-Total (mg/kg)		64900	50900	55400	46100	38600
	Cesium (Cs)-Total (mg/kg)		0.120	0.374	0.410	0.631	0.784
	Chromium (Cr)-Total (mg/kg)		0.289	<0.20	0.38	0.67	0.20
	Cobalt (Co)-Total (mg/kg)		0.128	0.148	0.119	0.223	0.115
	Copper (Cu)-Total (mg/kg)		2.93	2.29	1.89	3.29	2.08
	Iron (Fe)-Total (mg/kg)		123	124	113	430	90.7
	Lead (Pb)-Total (mg/kg)		0.096	0.105	0.121	0.234	0.109
	Lithium (Li)-Total (mg/kg)		<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)		1630	1560	1580	1500	1370
	Manganese (Mn)-Total (mg/kg)		57.7	117	47.6	29.0	43.5
	Mercury (Hg)-Total (mg/kg)		0.383	0.161	0.575	0.468	0.314
	Molybdenum (Mo)-Total (mg/kg)		0.058	0.066	0.084	0.094	0.076
	Nickel (Ni)-Total (mg/kg)		0.79	0.75	1.31	2.43	1.49
	Phosphorus (P)-Total (mg/kg)		37600	33500	34600	29100	26800
	Potassium (K)-Total (mg/kg)		10100	9970	10700	9110	8860
	Rubidium (Rb)-Total (mg/kg)		1.57	1.91	3.44	3.34	3.55
	Selenium (Se)-Total (mg/kg)		6.57	6.93	5.48	5.33	5.65
	Sodium (Na)-Total (mg/kg)		4590	4080	4560	3500	3080
	Strontium (Sr)-Total (mg/kg)		99.8	85.3	79.7	66.7	75.8
	Tellurium (Te)-Total (mg/kg)		<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)		0.0288	0.0180	0.0203	0.0397	0.0174
	Tin (Sn)-Total (mg/kg)		<0.10	0.24	0.19	0.11	0.12
	Uranium (U)-Total (mg/kg)		0.0160	0.0173	0.0272	0.0269	0.0281
	Vanadium (V)-Total (mg/kg)		0.48	0.31	0.40	0.44	0.40
	Zinc (Zn)-Total (mg/kg)		122	95.0	119	82.0	80.9
	Zirconium (Zr)-Total (mg/kg)		<0.20	<0.20	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829583-31 TISSUE 05-SEP-16 AG1-LIVER	L1829583-32 TISSUE 05-SEP-16 AG1-MUSCLE	L1829583-33 TISSUE 05-SEP-16 AG2-LIVER	L1829583-34 TISSUE 05-SEP-16 AG2-MUSCLE	L1829583-35 TISSUE 05-SEP-16 AG3-LIVER
Grouping	Analyte					
TISSUE						
Physical Tests	% Moisture (%)	69.1	74.4	69.1	69.5	59.9
Metals	Aluminum (Al)-Total (mg/kg)	<5.0	2.9	<5.0	18.2	<5.0
	Antimony (Sb)-Total (mg/kg)	0.015	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.033	0.048	0.070	0.121	0.066
	Barium (Ba)-Total (mg/kg)	<0.050	1.57	<0.050	2.27	0.080
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	3.98	0.0303	0.428	0.0364	0.222
	Calcium (Ca)-Total (mg/kg)	162	24100	174	15000	921
	Cesium (Cs)-Total (mg/kg)	0.0292	0.142	0.0287	0.0755	0.0125
	Chromium (Cr)-Total (mg/kg)	<0.20	0.407	<0.20	0.288	<0.20
	Cobalt (Co)-Total (mg/kg)	1.60	0.092	0.513	0.115	0.346
	Copper (Cu)-Total (mg/kg)	4.95	1.54	5.47	1.54	4.10
	Iron (Fe)-Total (mg/kg)	274	41.8	81.9	73.9	67.8
	Lead (Pb)-Total (mg/kg)	<0.050	0.022	<0.050	0.043	<0.050
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	428	1290	544	1020	342
	Manganese (Mn)-Total (mg/kg)	3.94	6.55	3.67	9.19	3.79
	Mercury (Hg)-Total (mg/kg)	0.780	0.782	0.508	0.266	0.319
	Molybdenum (Mo)-Total (mg/kg)	0.361	0.053	0.437	0.060	0.313
	Nickel (Ni)-Total (mg/kg)	<0.20	0.28	<0.20	0.26	<0.20
	Phosphorus (P)-Total (mg/kg)	7410	21500	9640	15600	6300
	Potassium (K)-Total (mg/kg)	8310	12800	10100	12100	6270
	Rubidium (Rb)-Total (mg/kg)	2.12	2.27	3.69	2.62	2.38
	Selenium (Se)-Total (mg/kg)	11.4	5.26	8.52	5.14	6.25
	Sodium (Na)-Total (mg/kg)	3310	2410	2660	2130	1980
	Strontium (Sr)-Total (mg/kg)	0.29	27.2	0.21	16.8	1.16
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.156	0.0304	0.159	0.0297	0.119
	Tin (Sn)-Total (mg/kg)	0.21	<0.10	0.14	<0.10	0.33
	Uranium (U)-Total (mg/kg)	0.0042	0.0051	<0.0020	0.0055	<0.0020
	Vanadium (V)-Total (mg/kg)	0.25	<0.10	0.19	0.15	<0.10
	Zinc (Zn)-Total (mg/kg)	56.9	53.5	77.7	45.3	52.7
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829583-36 TISSUE 05-SEP-16 AG3-MUSCLE	L1829583-37 TISSUE 05-SEP-16 AG4-LIVER	L1829583-38 TISSUE 05-SEP-16 AG4-MUSCLE	L1829583-39 TISSUE 05-SEP-16 AG5-LIVER	L1829583-40 TISSUE 05-SEP-16 AG5-MUSCLE
Grouping	Analyte					
TISSUE						
Physical Tests	% Moisture (%)	66.9	60.2	70.6	75.9	71.2
Metals	Aluminum (Al)-Total (mg/kg)	<2.0	<5.0	<2.0	<5.0	<2.0
	Antimony (Sb)-Total (mg/kg)	0.255	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.298	0.050	0.055	0.053	0.057
	Barium (Ba)-Total (mg/kg)	1.04	<0.050	0.581	0.111	1.21
	Beryllium (Be)-Total (mg/kg)	0.024	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	0.259	<0.010	<0.010	<0.010	<0.010
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.0319	0.666	0.0255	1.33	0.0227
	Calcium (Ca)-Total (mg/kg)	14700	146	12900	514	14900
	Cesium (Cs)-Total (mg/kg)	0.0574	0.0133	0.0407	0.0474	0.0798
	Chromium (Cr)-Total (mg/kg)	0.145	0.63	0.146	<0.20	0.122
	Cobalt (Co)-Total (mg/kg)	0.100	0.437	0.043	0.595	0.111
	Copper (Cu)-Total (mg/kg)	1.18	3.66	1.35	6.58	1.63
	Iron (Fe)-Total (mg/kg)	23.8	96.8	23.5	131	42.1
	Lead (Pb)-Total (mg/kg)	0.142	<0.050	<0.020	<0.050	<0.020
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	942	316	989	794	1190
	Manganese (Mn)-Total (mg/kg)	2.93	2.16	1.77	6.67	6.63
	Mercury (Hg)-Total (mg/kg)	0.321	0.196	0.354	0.588	0.349
	Molybdenum (Mo)-Total (mg/kg)	0.084	0.221	0.024	0.419	0.029
	Nickel (Ni)-Total (mg/kg)	0.30	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)-Total (mg/kg)	13500	5600	14200	14100	16000
	Potassium (K)-Total (mg/kg)	10900	5560	12800	13600	13300
	Rubidium (Rb)-Total (mg/kg)	2.20	2.33	2.68	6.44	3.39
	Selenium (Se)-Total (mg/kg)	4.09	6.16	3.92	14.4	6.26
	Sodium (Na)-Total (mg/kg)	1550	2040	1840	4540	2100
	Strontium (Sr)-Total (mg/kg)	17.5	0.24	13.3	0.83	18.6
	Tellurium (Te)-Total (mg/kg)	0.034	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.280	0.116	0.0209	0.177	0.0247
	Tin (Sn)-Total (mg/kg)	0.16	<0.10	<0.10	0.51	<0.10
	Uranium (U)-Total (mg/kg)	0.0033	<0.0020	<0.0020	0.0024	0.0029
	Vanadium (V)-Total (mg/kg)	0.15	<0.10	<0.10	0.11	<0.10
	Zinc (Zn)-Total (mg/kg)	38.6	39.9	36.9	82.4	49.8
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829583-41 TISSUE 07-SEP-16 AG6-LIVER	L1829583-42 TISSUE 07-SEP-16 AG6-MUSCLE	L1829583-43 TISSUE 07-SEP-16 AG7-LIVER	L1829583-44 TISSUE 07-SEP-16 AG7-MUSCLE	L1829583-45 TISSUE 09-SEP-16 AG8-LIVER
Grouping	Analyte					
TISSUE						
Physical Tests	% Moisture (%)	60.9	71.4	55.8	69.9	71.3
Metals	Aluminum (Al)-Total (mg/kg)	<5.0	4.4	<5.0	<2.0	<5.0
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.070	0.043	0.046	0.057	0.072
	Barium (Ba)-Total (mg/kg)	<0.050	1.46	<0.050	0.726	0.057
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.644	0.0514	1.05	0.0278	0.464
	Calcium (Ca)-Total (mg/kg)	172	19200	112	13500	221
	Cesium (Cs)-Total (mg/kg)	0.0166	0.0870	0.0107	0.0469	0.0467
	Chromium (Cr)-Total (mg/kg)	0.25	0.098	<0.20	0.140	<0.20
	Cobalt (Co)-Total (mg/kg)	0.373	0.077	0.637	0.072	0.458
	Copper (Cu)-Total (mg/kg)	3.69	1.77	3.25	1.66	6.60
	Iron (Fe)-Total (mg/kg)	145	31.6	141	30.6	100
	Lead (Pb)-Total (mg/kg)	<0.050	0.022	<0.050	<0.020	<0.050
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	336	1210	285	1120	626
	Manganese (Mn)-Total (mg/kg)	2.41	5.07	2.87	4.60	6.89
	Mercury (Hg)-Total (mg/kg)	0.312	0.404	0.232	0.390	0.728
	Molybdenum (Mo)-Total (mg/kg)	0.215	0.026	0.226	0.022	0.409
	Nickel (Ni)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20
	Phosphorus (P)-Total (mg/kg)	5700	18500	4980	15200	11100
	Potassium (K)-Total (mg/kg)	5850	14200	4970	14000	10400
	Rubidium (Rb)-Total (mg/kg)	2.19	2.80	1.57	2.31	4.58
	Selenium (Se)-Total (mg/kg)	6.37	3.64	9.73	5.13	9.98
	Sodium (Na)-Total (mg/kg)	2280	2200	1870	1860	2340
	Strontium (Sr)-Total (mg/kg)	0.27	19.8	0.17	14.9	0.32
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0848	0.0285	0.0745	0.0220	0.276
	Tin (Sn)-Total (mg/kg)	0.24	<0.10	0.22	<0.10	0.44
	Uranium (U)-Total (mg/kg)	<0.0020	0.0025	<0.0020	<0.0020	<0.0020
	Vanadium (V)-Total (mg/kg)	<0.10	<0.10	<0.10	<0.10	<0.10
	Zinc (Zn)-Total (mg/kg)	46.7	45.5	36.4	37.2	77.9
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829583-46 TISSUE 09-SEP-16 AG8-MUSCLE	L1829583-47 TISSUE 09-SEP-16 AG9-LIVER	L1829583-48 TISSUE 09-SEP-16 AG9-MUSCLE	L1829583-49 TISSUE 09-SEP-16 AG-10-LIVER	L1829583-50 TISSUE 09-SEP-16 AG-10-MUSCLE
Grouping	Analyte					
TISSUE						
Physical Tests	% Moisture (%)	71.6	71.7	73.0	65.5	72.5
Metals	Aluminum (Al)-Total (mg/kg)	4.0	<5.0	12.1	<5.0	2.6
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.069	0.097	0.081	0.129	0.077
	Barium (Ba)-Total (mg/kg)	2.23	0.066	2.32	<0.050	1.32
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.0449	0.549	0.0642	0.141	0.0191
	Calcium (Ca)-Total (mg/kg)	22600	246	19200	191	19300
	Cesium (Cs)-Total (mg/kg)	0.0600	0.0455	0.0464	0.0374	0.0801
	Chromium (Cr)-Total (mg/kg)	0.237	<0.20	0.388	<0.20	0.167
	Cobalt (Co)-Total (mg/kg)	0.055	0.287	0.079	0.325	0.052
	Copper (Cu)-Total (mg/kg)	2.07	5.65	2.08	4.87	2.18
	Iron (Fe)-Total (mg/kg)	28.2	121	66.5	113	34.0
	Lead (Pb)-Total (mg/kg)	0.028	<0.050	0.036	<0.050	<0.020
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	1350	578	1300	479	1320
	Manganese (Mn)-Total (mg/kg)	8.71	3.92	10.7	4.05	4.56
	Mercury (Hg)-Total (mg/kg)	0.401	0.653	0.347	0.626	0.402
	Molybdenum (Mo)-Total (mg/kg)	0.034	0.398	0.056	0.401	0.026
	Nickel (Ni)-Total (mg/kg)	0.25	<0.20	0.39	<0.20	<0.20
	Phosphorus (P)-Total (mg/kg)	21900	10100	20100	8570	20400
	Potassium (K)-Total (mg/kg)	15100	11300	15400	8450	15500
	Rubidium (Rb)-Total (mg/kg)	2.15	3.60	1.90	3.26	2.69
	Selenium (Se)-Total (mg/kg)	3.39	9.86	4.20	8.46	4.04
	Sodium (Na)-Total (mg/kg)	2120	2610	2100	2260	2170
	Strontium (Sr)-Total (mg/kg)	28.9	0.35	23.8	0.29	22.7
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0244	0.206	0.0287	0.210	0.0312
	Tin (Sn)-Total (mg/kg)	<0.10	0.33	0.14	0.27	0.16
	Uranium (U)-Total (mg/kg)	0.0030	<0.0020	0.0039	<0.0020	<0.0020
	Vanadium (V)-Total (mg/kg)	<0.10	<0.10	<0.10	<0.10	<0.10
	Zinc (Zn)-Total (mg/kg)	57.0	60.7	49.3	61.1	61.9
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829583-51 TISSUE 09-SEP-16 AG11-LIVER	L1829583-52 TISSUE 09-SEP-16 AG11-MUSCLE	L1829583-53 TISSUE 09-SEP-16 AG12-LIVER	L1829583-54 TISSUE 09-SEP-16 AG12-MUSCLE	L1829583-55 TISSUE 09-SEP-16 AG13-LIVER
Grouping	Analyte					
TISSUE						
Physical Tests	% Moisture (%)	74.4	72.1	74.2	72.9	76.3
Metals	Aluminum (Al)-Total (mg/kg)	6.9	2.6	<5.0	2.0	5.3
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.150	0.071	0.060	0.085	0.116
	Barium (Ba)-Total (mg/kg)	0.451	1.53	0.090	1.86	0.169
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.250	0.0127	0.226	0.0258	0.229
	Calcium (Ca)-Total (mg/kg)	738	18700	226	20600	929
	Cesium (Cs)-Total (mg/kg)	0.0534	0.0345	0.0537	0.0559	0.201
	Chromium (Cr)-Total (mg/kg)	0.87	0.361	<0.20	0.217	<0.20
	Cobalt (Co)-Total (mg/kg)	0.332	0.045	0.336	0.059	0.719
	Copper (Cu)-Total (mg/kg)	5.97	2.00	5.71	2.22	5.25
	Iron (Fe)-Total (mg/kg)	159	29.6	145	35.7	177
	Lead (Pb)-Total (mg/kg)	<0.050	<0.020	<0.050	<0.020	<0.050
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	798	1210	593	1430	686
	Manganese (Mn)-Total (mg/kg)	8.24	4.86	5.20	7.44	6.72
	Mercury (Hg)-Total (mg/kg)	0.781	0.390	0.549	0.335	0.424
	Molybdenum (Mo)-Total (mg/kg)	0.395	0.047	0.406	0.034	0.403
	Nickel (Ni)-Total (mg/kg)	0.64	0.31	<0.20	0.23	<0.20
	Phosphorus (P)-Total (mg/kg)	11600	18900	9810	21900	12300
	Potassium (K)-Total (mg/kg)	13300	14200	11400	16200	13200
	Rubidium (Rb)-Total (mg/kg)	4.29	2.26	4.33	2.69	8.03
	Selenium (Se)-Total (mg/kg)	10.9	3.76	11.7	4.75	11.3
	Sodium (Na)-Total (mg/kg)	3990	1880	2770	2210	3880
	Strontium (Sr)-Total (mg/kg)	1.97	21.1	0.35	25.4	1.34
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.167	0.0260	0.245	0.0319	0.338
	Tin (Sn)-Total (mg/kg)	1.45	0.11	0.22	0.16	1.69
	Uranium (U)-Total (mg/kg)	0.0033	<0.0020	<0.0020	0.0029	0.0020
	Vanadium (V)-Total (mg/kg)	0.13	<0.10	<0.10	<0.10	0.11
	Zinc (Zn)-Total (mg/kg)	74.6	52.1	68.9	54.0	66.3
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID		L1829583-56 TISSUE 09-SEP-16 AG13-MUSCLE	L1829583-57 TISSUE 09-SEP-16 AG14-LIVER	L1829583-58 TISSUE 09-SEP-16 AG14-MUSCLE	L1829583-59 TISSUE 09-SEP-16 AG15-LIVER	L1829583-60 TISSUE 09-SEP-16 AG15-MUSCLE
Grouping	Analyte					
TISSUE						
Physical Tests	% Moisture (%)	75.5	78.8	74.0	61.7	70.4
Metals	Aluminum (Al)-Total (mg/kg)	5.7	<5.0	<2.0	<5.0	<2.0
	Antimony (Sb)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Arsenic (As)-Total (mg/kg)	0.130	0.085	0.080	0.033	0.055
	Barium (Ba)-Total (mg/kg)	2.81	0.258	1.46	<0.050	1.12
	Beryllium (Be)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Bismuth (Bi)-Total (mg/kg)	<0.010	<0.010	<0.010	<0.010	<0.010
	Boron (B)-Total (mg/kg)	<1.0	<1.0	<1.0	<1.0	<1.0
	Cadmium (Cd)-Total (mg/kg)	0.0400	0.486	0.0275	0.661	0.0203
	Calcium (Ca)-Total (mg/kg)	27400	514	21400	96	20900
	Cesium (Cs)-Total (mg/kg)	0.353	0.0837	0.0871	0.0291	0.159
	Chromium (Cr)-Total (mg/kg)	0.479	<0.20	0.347	<0.20	0.166
	Cobalt (Co)-Total (mg/kg)	0.227	0.829	0.076	0.683	0.057
	Copper (Cu)-Total (mg/kg)	1.92	6.27	1.65	3.62	1.67
	Iron (Fe)-Total (mg/kg)	71.2	151	28.8	141	22.4
	Lead (Pb)-Total (mg/kg)	0.030	<0.050	0.027	<0.050	<0.020
	Lithium (Li)-Total (mg/kg)	<0.50	<0.50	<0.50	<0.50	<0.50
	Magnesium (Mg)-Total (mg/kg)	1460	770	1390	348	1200
	Manganese (Mn)-Total (mg/kg)	21.2	8.96	7.18	3.42	7.02
	Mercury (Hg)-Total (mg/kg)	0.288	0.883	0.437	0.289	0.375
	Molybdenum (Mo)-Total (mg/kg)	0.073	0.504	0.032	0.304	0.023
	Nickel (Ni)-Total (mg/kg)	0.41	0.21	0.31	<0.20	<0.20
	Phosphorus (P)-Total (mg/kg)	25400	12700	21700	6140	20300
	Potassium (K)-Total (mg/kg)	16500	16300	16600	6730	13900
	Rubidium (Rb)-Total (mg/kg)	5.33	6.77	3.10	1.94	2.15
	Selenium (Se)-Total (mg/kg)	5.57	12.4	4.30	12.4	7.30
	Sodium (Na)-Total (mg/kg)	2460	4060	2360	1920	2120
	Strontium (Sr)-Total (mg/kg)	36.7	1.10	27.0	0.15	28.6
	Tellurium (Te)-Total (mg/kg)	<0.020	<0.020	<0.020	<0.020	<0.020
	Thallium (Tl)-Total (mg/kg)	0.0479	0.320	0.0330	0.102	0.0192
	Tin (Sn)-Total (mg/kg)	0.12	1.56	0.13	0.29	<0.10
	Uranium (U)-Total (mg/kg)	0.0103	0.0020	0.0050	<0.0020	0.0043
	Vanadium (V)-Total (mg/kg)	0.11	<0.10	<0.10	0.17	<0.10
	Zinc (Zn)-Total (mg/kg)	63.6	72.4	48.4	44.2	42.3
	Zirconium (Zr)-Total (mg/kg)	<0.20	<0.20	<0.20	<0.20	<0.20

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Antimony (Sb)-Total	DUP-H	L1829583-10, -27, -28, -3, -35, -4, -41, -43, -45, -49, -5, -59, -6, -7, -9
Duplicate	Chromium (Cr)-Total	DUP-H	L1829583-10, -27, -28, -3, -35, -4, -41, -43, -45, -49, -5, -59, -6, -7, -9
Duplicate	Iron (Fe)-Total	DUP-H	L1829583-12, -16, -20, -22, -23, -24, -25, -29, -30, -31, -33, -37, -39, -47
Duplicate	Iron (Fe)-Total	DUP-H	L1829583-47
Method Blank	Manganese (Mn)-Total	MB-LOR	L1829583-1, -11, -13, -14, -15, -17, -18, -19, -2, -21, -26, -32, -34, -36, -38, -40, -42, -44, -46, -48, -50, -52, -54, -56, -58, -60, -8
Method Blank	Manganese (Mn)-Total	MB-LOR	L1829583-1, -11, -13, -14, -15, -17, -18, -19, -2, -21, -26, -32, -34, -36, -38, -40, -42, -44, -46, -48, -50, -52, -54, -56, -58, -60, -8
Method Blank	Thallium (Tl)-Total	MB-LOR	L1829583-10, -27, -28, -3, -35, -4, -41, -43, -45, -49, -5, -59, -6, -7, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
HG-DRY-CVAFS-N-VA	Tissue	Mercury in Tissue by CVAFS (DRY)	EPA 200.3, EPA 245.7
This method is conducted following British Columbia Lab Manual method "Metals in Animal Tissue and Vegetation (Biota) - Prescriptive". Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with addition of hydrogen peroxide. Analysis is by atomic fluorescence spectrophotometry or atomic absorption spectrophotometry, adapted from US EPA Method 245.7.			
HG-DRY-MICR-CVAF-VA	Tissue	Mercury in Tissue by CVAFS Micro (DRY)	EPA 200.3, EPA 245.7
This method is adapted from US EPA Method 200.3 "Sample Procedures for Spectrochemical Determination of Total Recoverable Elements in Biological Tissues" (1996). Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with repeated additions of hydrogen peroxide. Analysis is by atomic fluorescence spectrophotometry or atomic absorption spectrophotometry, adapted from US EPA Method 245.7.			
MET-DRY-CCMS-N-VA	Tissue	Metals in Tissue by CRC ICPMS (DRY)	EPA 200.3/6020A
This method is conducted following British Columbia Lab Manual method "Metals in Animal Tissue and Vegetation (Biota) - Prescriptive". Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with addition of hydrogen peroxide. Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).			
Method Limitation: This method employs a strong acid/peroxide digestion, and is intended to provide a conservative estimate of bio-available metals. Near complete recoveries are achieved for most toxicologically important metals, but elements associated with recalcitrant minerals may be only partially recovered.			
MET-DRY-MICR-HRMS-VA	Tissue	Metals in Tissue by HR-ICPMS Micro (DRY)	EPA 200.3/200.8
Trace metals in tissue are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) modified from US EPA Method 200.8, (Revision 5.5). The sample preparation procedure is modified from US EPA 200.3. Analytical results are reported on dry weight basis.			
Method Limitation: This method employs a strong acid/peroxide digestion, and is intended to provide a conservative estimate of bio-available metals. Near complete recoveries are achieved for most toxicologically important metals, but elements associated with recalcitrant minerals may be only partially recovered.			
MOISTURE-TESS-VA	Tissue	% Moisture in Tissues	ASTM D2974-00 Method A
This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.			

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

Reference Information

14-470934

14-470935

14-470936

14-470937

14-470938

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg ww - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.