EDI ENVIRONMENTAL DYNAMICS INC.
ATTN: Lyndsay Doetzel
2195 - 2nd Ave
Whitehorse YT Y1A 3T8

Date Received: 09-NOV-16
Report Date: 05-DEC-16 15:58 (MT)
Version: FINAL REV. 2

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1856464

Project P.O. #: NOT SUBMITTED
Job Reference: MOUNT NANSEN 16-Y-0089
C of C Numbers:
Legal Site Desc:

Comments: ADDITIONAL 29-NOV-16 15:03

5-DEC-2016 Revision 2: This revision includes additional analyses performed on the sample, L1856464-8. Please note that cyanate analysis could not be performed on this sample as the specifically preserved bottle submitted could only be used for cyanides analysis instead.

Can Dang
Senior Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1856464-1	L1856464-2	L1856464-3	L1856464-4	L1856464-5
	Description	Water	Water	Water	Water	Water
	Sampled Date	07-NOV-16	08-NOV-16	08-NOV-16	08-NOV-16	08-NOV-16
	Sampled Time	15:50	13:30	16:30	08:50	16:45
	Client ID	WQ-DC-U	WQ-VC-U	WQ-DX+105	WQ-DC-B	WQ-DX+105-R
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)					
	Conductivity (uS/cm)	1380	214	1110	2190	1110
	Hardness (as CaCO3) (mg/L)	748	102	637	1440	668
	pH (pH)	7.66	7.88	7.64	7.63	7.81
	Total Suspended Solids (mg/L)	9.7	<3.0	4.3	5.5	3.9
	Total Dissolved Solids (mg/L)					
	TDS (Calculated) (mg/L)	1030	114	789	1870	800
	Turbidity (NTU)					
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	258	95.6	274	346	279
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Total (as CaCO3) (mg/L)	258	95.6	274	346	279
	Ammonia, Total (as N) (mg/L)	3.36	<0.0050	0.0207	0.516	0.0183
	Bromide (Br) (mg/L)	<0.25 DLDS	<0.050	<0.25 DLDS	<1.0 DLDS	<0.25 DLDS
	Chloride (Cl) (mg/L)	<2.5 DLDS	<0.50	<2.5 DLDS	<10 DLDS	<2.5 DLDS
	Fluoride (F) (mg/L)	0.11	0.050	0.17	<0.40 DLDS	0.17
	Nitrate (as N) (mg/L)	0.418	0.149	<0.025 DLDS	<0.10 DLDS	<0.025 DLDS
	Nitrite (as N) (mg/L)	0.0193	<0.0010	<0.0050 DLDS	<0.020 DLDS	<0.0050 DLDS
	Sulfate (SO4) (mg/L)	564	18.3	395	1150	391
	Anion Sum (meq/L)	16.9	2.30	13.7	30.9	13.7
	Cation Sum (meq/L)	16.8	2.16	13.1	29.9	13.7
	Cation - Anion Balance (%)	-0.4	-3.3	-2.3	-1.8	0.0
Cyanides	Cyanide, Weak Acid Diss (mg/L)	0.0246	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	0.0314	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanate (mg/L)	<2.0 DLIS	<0.20	<0.20	<0.20	<0.20
	Thiocyanate (SCN) (mg/L)	1.57	<0.50	<0.50	<0.50	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	0.0203	0.0328	0.0414	0.0037	0.0415
	Antimony (Sb)-Total (mg/L)	0.00032	<0.00010	0.00907	0.00217	0.00907
	Arsenic (As)-Total (mg/L)	0.0408	0.00031	0.0601	0.00498	0.0464
	Barium (Ba)-Total (mg/L)	0.0612	0.0738	0.0117	0.0670	0.0116
	Beryllium (Be)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Total (mg/L)	0.036	<0.010	<0.010	0.020	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000129	0.0000178	0.00239	0.0000701	0.00196
	Calcium (Ca)-Total (mg/L)	224	27.7	176	350	174
	Chromium (Cr)-Total (mg/L)	0.00035	0.00012	<0.00010	0.00013	<0.00010
	Cobalt (Co)-Total (mg/L)	0.00506	<0.00010	0.00084	0.00103	0.00081

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1856464-6	L1856464-7	L1856464-8	L1856464-9	L1856464-10
Description	Water	Water	Water	Water	Water
Sampled Date	08-NOV-16	07-NOV-16	20-JUL-16	07-NOV-16	07-NOV-16
Sampled Time	13:05	15:20		17:55	16:00
Client ID	WQ-VC-DBC	WQ-DC-R	TRAVEL BLANK	WQ-TP	WQ-DC-U-R
Grouping / **Analyte**					
WATER					
Physical Tests					
Colour, True (CU)	214	1080	<2.0	1610	1370
Conductivity (uS/cm)	105	610	<0.50 HTC	986	791
Hardness (as CaCO3) (mg/L)	7.74	7.36	5.44	7.95	7.67
pH (pH)	<3.0	8.7	<3.0	3.2	11.1
Total Suspended Solids (mg/L)	117	789	<1.0	1360	1050
Total Dissolved Solids (mg/L)	96.7	218	<1.0	149	262
TDS (Calculated) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
Turbidity (NTU)	<1.0	<1.0	<1.0	<1.0	<1.0
Anions and Nutrients	96.7	218	<1.0	149	262
Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<0.0050	1.09 DLDS	<0.0050 PEHT	0.0319 DLDS	3.31 DLDS
Alkalinity, Carbonate (as CaCO3) (mg/L)	<0.050	<0.25 DLDS	<0.050	<0.50 DLDS	<0.25 DLDS
Alkalinity, Hydroxide (as CaCO3) (mg/L)	<0.50	<2.5 DLDS	<0.50	<5.0 DLDS	<2.5 DLDS
Alkalinity, Total (as CaCO3) (mg/L)	0.050	<0.10 DLDS	<0.020	0.28 DLDS	0.11
Ammonia, Total (as N) (mg/L)	0.148	0.254	<0.0050	<0.050 DLDS	0.420
Bromide (Br) (mg/L)	<0.0010	0.0112	<0.0010	<0.010 DLDS	0.0194
Chloride (Cl) (mg/L)	18.6	411	<0.30	876	565
Fluoride (F) (mg/L)	2.33	12.9	<0.10	21.2	17.0
Nitrate (as N) (mg/L)	2.22	13.6	<0.10	21.1	17.6
Nitrite (as N) (mg/L)	-2.4	2.5	0.0	-0.3	1.7
Sulfate (SO4) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0081
Anion Sum (meq/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0170
Cation Sum (meq/L)	<0.20	<0.20		0.28	<0.20
Cation - Anion Balance (%)	<0.50	0.55	<0.50	<0.50	1.56
Cyanides					
Cyanide, Weak Acid Diss (mg/L)	0.0176	0.0175	<0.0030	0.0212	0.0216
Cyanide, Total (mg/L)	<0.00010	0.00089	<0.00010	0.0398	0.00033
Cyanate (mg/L)	0.00029	0.0456	<0.00010	0.129	0.0403
Thiocyanate (SCN) (mg/L)	0.0724	0.0672	<0.000050	0.0172	0.0606
Total Metals	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Aluminum (Al)-Total (mg/L)	<0.000050	<0.000050	<0.000050	0.000083	<0.000050
Antimony (Sb)-Total (mg/L)	<0.010	0.017	<0.010	0.084	0.035
Arsenic (As)-Total (mg/L)	0.0000173	0.0000670	<0.0000050	0.000571	0.000127
Barium (Ba)-Total (mg/L)	27.9	159	<0.050	309	219
Beryllium (Be)-Total (mg/L)	<0.00010	0.00040	<0.00010	0.00014	0.00036
Bismuth (Bi)-Total (mg/L)	<0.00010	0.00267	<0.00010	0.00051	0.00491
Boron (B)-Total (mg/L)					
Cadmium (Cd)-Total (mg/L)					
Calcium (Ca)-Total (mg/L)					
Chromium (Cr)-Total (mg/L)					
Cobalt (Co)-Total (mg/L)					

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1856464-11	L1856464-12	L1856464-13	L1856464-14	L1856464-15
Description	Water	Water	Water	Water	Water
Sampled Date	07-NOV-16	07-NOV-16	07-NOV-16	09-NOV-16	09-NOV-16
Sampled Time	10:25	13:55	17:30	09:45	09:45
Client ID	WQ-VC-UMN	WQ-VC-R+150	WQ-SEEP	WQ-FIELD BLANK	WQ-PW
Grouping / **Analyte**					
WATER					
Physical Tests Colour, True (CU)					<5.0
Conductivity (uS/cm)	233	222	1550	<2.0	352 HTC
Hardness (as CaCO3) (mg/L)	114	109	881	<0.50	189
pH (pH)	7.78	7.62	7.15	5.43	7.85
Total Suspended Solids (mg/L)	<3.0	<3.0	29.1	<3.0	
Total Dissolved Solids (mg/L)					203
TDS (Calculated) (mg/L)	128	123	1200	<1.0	
Turbidity (NTU)					0.15
Anions and Nutrients Alkalinity, Bicarbonate (as CaCO3) (mg/L)	96.7	92.4	285	<1.0	
Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	
Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	
Alkalinity, Total (as CaCO3) (mg/L)	96.7	92.4	285	<1.0	161
Ammonia, Total (as N) (mg/L)	<0.0050	0.0084	4.35	<0.0050	
Bromide (Br) (mg/L)	<0.050	<0.050	<0.25 DLDS	<0.050	
Chloride (Cl) (mg/L)	<0.50	<0.50	<2.5 DLDS	<0.50	<0.50
Fluoride (F) (mg/L)	0.052	0.052	<0.10 DLDS	<0.020	0.103
Nitrate (as N) (mg/L)	0.136	0.127	1.04	<0.0050	0.122
Nitrite (as N) (mg/L)	<0.0010	<0.0010	0.0317	<0.0010	<0.0010
Sulfate (SO4) (mg/L)	26.9	25.4	646	<0.30	30.6
Anion Sum (meq/L)	2.50	2.39	19.2	<0.10	
Cation Sum (meq/L)	2.42	2.32	20.4	<0.10	
Cation - Anion Balance (%)	-1.7	-1.4	2.9	0.0	
Cyanides Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	0.0123	<0.0050	
Cyanide, Total (mg/L)	<0.0050	<0.0050	0.0504	<0.0050	
Cyanate (mg/L)	<0.20	<0.20	<0.20	<0.20	
Thiocyanate (SCN) (mg/L)	<0.50	<0.50	5.13	<0.50	
Total Metals Aluminum (Al)-Total (mg/L)	0.0324	0.0356	0.0134	<0.0030	<0.010
Antimony (Sb)-Total (mg/L)	0.00020	0.00023	0.00051	<0.00010	<0.00050
Arsenic (As)-Total (mg/L)	0.00086	0.00092	0.0516	<0.00010	0.00040
Barium (Ba)-Total (mg/L)	0.0709	0.0718	0.0555	<0.000050	0.082
Beryllium (Be)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	
Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	
Boron (B)-Total (mg/L)	<0.010	<0.010	0.049	<0.010	<0.10
Cadmium (Cd)-Total (mg/L)	0.0000243	0.0000215	0.000497	<0.0000050	<0.00020
Calcium (Ca)-Total (mg/L)	29.2	28.5	252	<0.050	42.3
Chromium (Cr)-Total (mg/L)	0.00012	0.00013	0.00051	<0.00010	<0.0020
Cobalt (Co)-Total (mg/L)	<0.00010	0.00011	0.00767	<0.00010	

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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1856464-1	L1856464-2	L1856464-3	L1856464-4	L1856464-5
	Description	Water	Water	Water	Water	Water
	Sampled Date	07-NOV-16	08-NOV-16	08-NOV-16	08-NOV-16	08-NOV-16
	Sampled Time	15:50	13:30	16:30	08:50	16:45
	Client ID	WQ-DC-U	WQ-VC-U	WQ-DX+105	WQ-DC-B	WQ-DX+105-R
Grouping	**Analyte**					
WATER						
Total Metals	Copper (Cu)-Total (mg/L)	0.00122	0.00098	<0.00050	<0.00050	<0.00050
	Iron (Fe)-Total (mg/L)	4.38	0.068	0.560	2.50	0.414
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	0.000355	<0.000050	0.000237
	Lithium (Li)-Total (mg/L)	<0.0010	<0.0010	0.0089	0.0056	0.0086
	Magnesium (Mg)-Total (mg/L)	60.9	10.3	60.9	168	60.4
	Manganese (Mn)-Total (mg/L)	4.82	0.0607	1.17	1.83	1.14
	Mercury (Hg)-Total (mg/L)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
	Molybdenum (Mo)-Total (mg/L)	0.000809	0.000420	0.000377	0.000354	0.000367
	Nickel (Ni)-Total (mg/L)	0.00211	<0.00050	0.00156	0.00135	0.00160
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	5.36	0.64	3.63	5.39	3.56
	Selenium (Se)-Total (mg/L)	0.000215	0.000058	<0.000050	0.000079	<0.000050
	Silicon (Si)-Total (mg/L)	7.15	6.23	6.83	9.94	6.77
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	28.1	2.78	5.27	18.1	5.28
	Strontium (Sr)-Total (mg/L)	0.688	0.324	0.428	1.26	0.429
	Sulfur (S)-Total (mg/L)	212	6.53	143	451	144
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	0.000107	<0.000010	0.000095
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	0.00126	0.00101	0.00177	<0.00030	0.00220
	Uranium (U)-Total (mg/L)	0.00162	0.000744	0.00434	0.00438	0.00442
	Vanadium (V)-Total (mg/L)	0.00104	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Total (mg/L)	0.0157	<0.0030	0.770	0.0360	0.765
	Zirconium (Zr)-Total (mg/L)	0.00034	<0.00030	<0.00030	<0.00030	<0.00030
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)	0.0084	0.0062	<0.0010	0.0023	<0.0010
	Antimony (Sb)-Dissolved (mg/L)	0.00030	<0.00010	0.00876	0.00210	0.00901
	Arsenic (As)-Dissolved (mg/L)	0.0377	0.00026	0.0177	0.00475	0.0183
	Barium (Ba)-Dissolved (mg/L)	0.0582	0.0674	0.0107	0.0642	0.0118
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000040 DLA	<0.000020
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.00010 DLA	<0.000050
	Boron (B)-Dissolved (mg/L)	0.032	<0.010	<0.010	<0.020 DLA	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.000123	0.0000128	0.000627	0.000079	0.000601
	Calcium (Ca)-Dissolved (mg/L)	210	25.7	165	327	174
	Chromium (Cr)-Dissolved (mg/L)	0.00019	<0.00010	<0.00010	<0.00020 DLA	<0.00010
	Cobalt (Co)-Dissolved (mg/L)	0.00460	<0.00010	0.00074	0.00098	0.00075

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ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1856464-6	L1856464-7	L1856464-8	L1856464-9	L1856464-10
	Description	Water	Water	Water	Water	Water
	Sampled Date	08-NOV-16	07-NOV-16	20-JUL-16	07-NOV-16	07-NOV-16
	Sampled Time	13:05	15:20		17:55	16:00
	Client ID	WQ-VC-DBC	WQ-DC-R	TRAVEL BLANK	WQ-TP	WQ-DC-U-R
Grouping	**Analyte**					
WATER						
Total Metals	Copper (Cu)-Total (mg/L)	0.00095	0.00082	<0.00050	0.0255	0.00121
	Iron (Fe)-Total (mg/L)	0.042	4.08	<0.010	0.228	4.30
	Lead (Pb)-Total (mg/L)	<0.000050	0.000144	<0.000050	0.00686	0.000055
	Lithium (Li)-Total (mg/L)	<0.0010	<0.0010	<0.0010	0.0113	<0.0010
	Magnesium (Mg)-Total (mg/L)	9.99	51.6	<0.10	60.2	60.1
	Manganese (Mn)-Total (mg/L)	0.0550	2.61	<0.00010	0.132	4.70
	Mercury (Hg)-Total (mg/L)	<0.0000050	<0.0000050	<0.0000050	0.0000078	<0.0000050
	Molybdenum (Mo)-Total (mg/L)	0.000426	0.000377	<0.000050	0.00147	0.000804
	Nickel (Ni)-Total (mg/L)	<0.00050	0.00137	<0.00050	0.00096	0.00215
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	0.63	4.82	<0.10	21.1	5.30
	Selenium (Se)-Total (mg/L)	0.000058	0.000115	<0.000050	0.000065	0.000184
	Silicon (Si)-Total (mg/L)	6.00	8.02	<0.050	4.55	7.04
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	0.000178	0.000010
	Sodium (Na)-Total (mg/L)	2.69	21.1	<0.050	19.7	27.6
	Strontium (Sr)-Total (mg/L)	0.326	0.527	<0.00020	0.849	0.691
	Sulfur (S)-Total (mg/L)	6.57	151	<0.50	330	210
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	0.000156	<0.000010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	0.00043	0.00079	<0.00030	<0.00030	0.00154
	Uranium (U)-Total (mg/L)	0.000737	0.000986	<0.000010	0.00142	0.00164
	Vanadium (V)-Total (mg/L)	<0.00050	0.00073	<0.00050	<0.00050	0.00106
	Zinc (Zn)-Total (mg/L)	<0.0030	0.0119	<0.0030	0.0733	0.0158
	Zirconium (Zr)-Total (mg/L)	<0.00030	0.00030	<0.00030	<0.00030	0.00034
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD		FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD		FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0065	0.0140		0.0024	0.0075
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	0.00089		0.0392	0.00033
	Arsenic (As)-Dissolved (mg/L)	0.00024	0.0454		0.104	0.0390
	Barium (Ba)-Dissolved (mg/L)	0.0700	0.0751		0.0178	0.0646
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020		<0.000020	<0.000020
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050		<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)	<0.010	0.018		0.083	0.037
	Cadmium (Cd)-Dissolved (mg/L)	0.0000192	0.0000558		0.000450	0.000107
	Calcium (Ca)-Dissolved (mg/L)	26.9	162		301	226
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	0.00032		<0.00010	0.00028
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	0.00239		0.00047	0.00431

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1856464-11	L1856464-12	L1856464-13	L1856464-14	L1856464-15
	Description	Water	Water	Water	Water	Water
	Sampled Date	07-NOV-16	07-NOV-16	07-NOV-16	09-NOV-16	09-NOV-16
	Sampled Time	10:25	13:55	17:30	09:45	09:45
	Client ID	WQ-VC-UMN	WQ-VC-R+150	WQ-SEEP	WQ-FIELD BLANK	WQ-PW
Grouping	**Analyte**					
WATER						
Total Metals	Copper (Cu)-Total (mg/L)	0.00107	0.00115	0.00326	<0.00050	<0.0010
	Iron (Fe)-Total (mg/L)	0.067	0.140	11.5	<0.010	<0.030
	Lead (Pb)-Total (mg/L)	0.000176	0.000169	<0.000050	<0.000050	0.00064
	Lithium (Li)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Magnesium (Mg)-Total (mg/L)	10.4	9.99	57.7	<0.10	20.2
	Manganese (Mn)-Total (mg/L)	0.0601	0.0567	5.80	<0.00010	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.00020
	Molybdenum (Mo)-Total (mg/L)	0.000401	0.000403	0.00107	<0.000050	
	Nickel (Ni)-Total (mg/L)	<0.00050	<0.00050	0.00351	<0.00050	
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	
	Potassium (K)-Total (mg/L)	0.68	0.70	6.40	<0.10	0.94
	Selenium (Se)-Total (mg/L)	<0.000050	0.000054	0.000289	<0.000050	<0.0010
	Silicon (Si)-Total (mg/L)	5.94	6.09	7.57	<0.050	
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	0.000026	<0.000010	
	Sodium (Na)-Total (mg/L)	2.98	2.98	35.8	0.085	4.8
	Strontium (Sr)-Total (mg/L)	0.320	0.298	0.739	<0.00020	
	Sulfur (S)-Total (mg/L)	8.85	8.52	239	<0.50	
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Titanium (Ti)-Total (mg/L)	0.00093	0.00087	0.00087	<0.00030	
	Uranium (U)-Total (mg/L)	0.000707	0.000642	0.00233	<0.000010	0.00169
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	0.00201	<0.00050	
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030	0.0554	<0.0030	<0.050
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	0.00065	<0.00030	
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	
	Aluminum (Al)-Dissolved (mg/L)	0.0063	0.0104	0.0096	<0.0010	
	Antimony (Sb)-Dissolved (mg/L)	0.00018	0.00021	0.00054	<0.00010	
	Arsenic (As)-Dissolved (mg/L)	0.00068	0.00076	0.0487	<0.00010	
	Barium (Ba)-Dissolved (mg/L)	0.0713	0.0708	0.0604	<0.000050	
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	0.050	<0.010	
	Cadmium (Cd)-Dissolved (mg/L)	0.0000194	0.0000203	0.000433	<0.0000050	
	Calcium (Ca)-Dissolved (mg/L)	29.4	28.4	262	<0.050	
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	0.00012	0.00042	<0.00010	
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	<0.00010	0.00708	<0.00010	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1856464-1 Water 07-NOV-16 15:50 WQ-DC-U	L1856464-2 Water 08-NOV-16 13:30 WQ-VC-U	L1856464-3 Water 08-NOV-16 16:30 WQ-DX+105	L1856464-4 Water 08-NOV-16 08:50 WQ-DC-B	L1856464-5 Water 08-NOV-16 16:45 WQ-DX+105-R
WATER						
Dissolved Metals	Copper (Cu)-Dissolved (mg/L)	0.00095	0.00082	<0.00020	<0.00040 DLA	<0.00020
	Iron (Fe)-Dissolved (mg/L)	3.68	0.018	0.122	1.82	0.126
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.00010 DLA	<0.000050
	Lithium (Li)-Dissolved (mg/L)	<0.0010	<0.0010	0.0083	0.0054	0.0088
	Magnesium (Mg)-Dissolved (mg/L)	54.4	9.07	54.4	152	56.8
	Manganese (Mn)-Dissolved (mg/L)	4.38	0.0512	1.05	1.75	1.09
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.000688	0.000372	0.000316	0.00030	0.000330
	Nickel (Ni)-Dissolved (mg/L)	0.00192	<0.00050	0.00144	0.0012	0.00138
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.10 DLA	<0.050
	Potassium (K)-Dissolved (mg/L)	4.96	0.59	3.42	5.11	3.74
	Selenium (Se)-Dissolved (mg/L)	0.000204	<0.000050	<0.000050	<0.00010 DLA	<0.000050
	Silicon (Si)-Dissolved (mg/L)	6.69	5.59	6.37	9.65	6.90
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000020 DLA	<0.000010
	Sodium (Na)-Dissolved (mg/L)	25.6	2.53	4.82	16.7	5.02
	Strontium (Sr)-Dissolved (mg/L)	0.652	0.302	0.401	1.18	0.410
	Sulfur (S)-Dissolved (mg/L)	184	5.19	126	405	137
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	0.000079	<0.000020 DLA	0.000079
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00020 DLA	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	0.00057	<0.00030	<0.00030	<0.00060 DLA	<0.00030
	Uranium (U)-Dissolved (mg/L)	0.00150	0.000627	0.00391	0.00393	0.00397
	Vanadium (V)-Dissolved (mg/L)	0.00084	<0.00050	<0.00050	<0.0010 DLA	<0.00050
	Zinc (Zn)-Dissolved (mg/L)	0.0150	<0.0010	0.714	0.0351	0.761
	Zirconium (Zr)-Dissolved (mg/L)	0.00032	<0.00030	<0.00030	<0.00060 DLA	<0.00030

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1856464-6 Water 08-NOV-16 13:05 WQ-VC-DBC	L1856464-7 Water 07-NOV-16 15:20 WQ-DC-R	L1856464-8 Water 20-JUL-16 TRAVEL BLANK	L1856464-9 Water 07-NOV-16 17:55 WQ-TP	L1856464-10 Water 07-NOV-16 16:00 WQ-DC-U-R
WATER						
Dissolved Metals	Copper (Cu)-Dissolved (mg/L)	0.00085	0.00066		0.0208	0.00089
	Iron (Fe)-Dissolved (mg/L)	0.019	3.67		0.024	3.58
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050		0.000620	<0.000050
	Lithium (Li)-Dissolved (mg/L)	<0.0010	<0.0010		0.0132	<0.0010
	Magnesium (Mg)-Dissolved (mg/L)	9.08	49.8		56.6	54.8
	Manganese (Mn)-Dissolved (mg/L)	0.0504	2.54		0.113	4.30
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050		<0.0000050	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.000358	0.000330		0.00122	0.000687
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	0.00121		0.00081	0.00175
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050		<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	0.63	5.06		21.5	5.33
	Selenium (Se)-Dissolved (mg/L)	0.000052	0.000140		0.000087	0.000179
	Silicon (Si)-Dissolved (mg/L)	6.10	8.31		4.63	7.07
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010		0.000052	<0.000010
	Sodium (Na)-Dissolved (mg/L)	2.62	20.6		18.9	25.5
	Strontium (Sr)-Dissolved (mg/L)	0.313	0.485		0.754	0.630
	Sulfur (S)-Dissolved (mg/L)	6.09	141		320	192
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010		0.000138	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010		<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.00030	0.00064		<0.00030	0.00058
	Uranium (U)-Dissolved (mg/L)	0.000679	0.000897		0.00121	0.00144
	Vanadium (V)-Dissolved (mg/L)	<0.00050	0.00066		<0.00050	0.00084
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	0.0121		0.0635	0.0152
	Zirconium (Zr)-Dissolved (mg/L)	<0.00030	<0.00030		<0.00030	0.00033

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1856464-11 Water 07-NOV-16 10:25 WQ-VC-UMN	L1856464-12 Water 07-NOV-16 13:55 WQ-VC-R+150	L1856464-13 Water 07-NOV-16 17:30 WQ-SEEP	L1856464-14 Water 09-NOV-16 09:45 WQ-FIELD BLANK	L1856464-15 Water 09-NOV-16 09:45 WQ-PW
WATER						
Dissolved Metals	Copper (Cu)-Dissolved (mg/L)	0.00094	0.00100	0.00224	<0.00020	
	Iron (Fe)-Dissolved (mg/L)	0.022	0.055	10.3	<0.010	
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	
	Lithium (Li)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	
	Magnesium (Mg)-Dissolved (mg/L)	9.74	9.19	55.3	<0.10	
	Manganese (Mn)-Dissolved (mg/L)	0.0545	0.0527	5.58	<0.00010	
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	
	Molybdenum (Mo)-Dissolved (mg/L)	0.000352	0.000340	0.000874	<0.000050	
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050	0.00303	<0.00050	
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	
	Potassium (K)-Dissolved (mg/L)	0.68	0.71	6.84	<0.10	
	Selenium (Se)-Dissolved (mg/L)	<0.000050	<0.000050	0.000292	<0.000050	
	Silicon (Si)-Dissolved (mg/L)	6.18	6.45	7.98	<0.050	
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	0.000011	<0.000010	
	Sodium (Na)-Dissolved (mg/L)	3.00	2.93	34.6	0.132 RRV	
	Strontium (Sr)-Dissolved (mg/L)	0.314	0.295	0.683	<0.00020	
	Sulfur (S)-Dissolved (mg/L)	8.85	8.56	229	<0.50	
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	
	Titanium (Ti)-Dissolved (mg/L)	<0.00030	<0.00030	0.00086	<0.00030	
	Uranium (U)-Dissolved (mg/L)	0.000666	0.000596	0.00210	<0.000010	
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050	0.00176	<0.00050	
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	0.0011	0.0541	0.0011 RRV	
	Zirconium (Zr)-Dissolved (mg/L)	<0.00030	<0.00030	0.00059	<0.00030	

* 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)
Method Blank	Aluminum (Al)-Total	MB-LOR	L1856464-8
Matrix Spike	Fluoride (F)	MS-B	L1856464-8
Matrix Spike	Aluminum (Al)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Boron (B)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Copper (Cu)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Potassium (K)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Selenium (Se)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Uranium (U)-Dissolved	MS-B	L1856464-1, -10, -11, -12, -13, -14, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Aluminum (Al)-Total	MS-B	L1856464-1, -10, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Aluminum (Al)-Total	MS-B	L1856464-8
Matrix Spike	Arsenic (As)-Total	MS-B	L1856464-1, -10, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Barium (Ba)-Total	MS-B	L1856464-1, -10, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Barium (Ba)-Total	MS-B	L1856464-8
Matrix Spike	Calcium (Ca)-Total	MS-B	L1856464-1, -10, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Calcium (Ca)-Total	MS-B	L1856464-8
Matrix Spike	Cobalt (Co)-Total	MS-B	L1856464-1, -10, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Iron (Fe)-Total	MS-B	L1856464-8
Matrix Spike	Lithium (Li)-Total	MS-B	L1856464-1, -10, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Magnesium (Mg)-Total	MS-B	L1856464-1, -10, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Magnesium (Mg)-Total	MS-B	L1856464-8
Matrix Spike	Manganese (Mn)-Total	MS-B	L1856464-1, -10, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Manganese (Mn)-Total	MS-B	L1856464-8

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Potassium (K)-Total	MS-B	L1856464-1, -10, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Potassium (K)-Total	MS-B	L1856464-8
Matrix Spike	Silicon (Si)-Total	MS-B	L1856464-1, -10, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Silicon (Si)-Total	MS-B	L1856464-8
Matrix Spike	Sodium (Na)-Total	MS-B	L1856464-1, -10, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Sodium (Na)-Total	MS-B	L1856464-8
Matrix Spike	Strontium (Sr)-Total	MS-B	L1856464-1, -10, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Strontium (Sr)-Total	MS-B	L1856464-8
Matrix Spike	Sulfur (S)-Total	MS-B	L1856464-1, -10, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Sulfur (S)-Total	MS-B	L1856464-8
Matrix Spike	Thallium (Tl)-Total	MS-B	L1856464-1, -10, -2, -3, -4, -5, -6, -7, -9
Matrix Spike	Titanium (Ti)-Total	MS-B	L1856464-8
Matrix Spike	Ammonia, Total (as N)	MS-B	L1856464-8

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLIS	Detection Limit Adjusted: Insufficient Sample
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHT	Parameter Exceeded Recommended Holding Time Prior to Analysis
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	EPA 310.2

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

ALK-TITR-VA	Water	Alkalinity Species by Titration	APHA 2320 Alkalinity

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

BE-D-L-CCMS-VA	Water	Diss. Be (low) 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.

BE-T-L-CCMS-VA	Water	Total Be (Low) 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.

BR-L-IC-N-VA	Water	Bromide in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

CL-IC-N-VA	Water	Chloride in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

CN-CNO-WT	Water	Cyanate	APHA 4500-CN-L

This analysis is carried out using procedures adapted from APHA method 4500-CN "Cyanide". Cyanate is determined by the Cyanate hydrolysis method using an ammonia selective electrode

CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE

This analysis is carried out using procedures adapted from APHA Method 4500-CN- M "Thiocyanate" Thiocyanate is determined by the ferric nitrate colourimetric method.

Reference Information

CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002

This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.

CN-WAD-CFA-VA	Water	Weak Acid Diss. Cyanide in water by CFA	APHA 4500-CN CYANIDE

This analysis is carried out using procedures adapted from APHA Method 4500-CN I. "Weak Acid Dissociable Cyanide". Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.

COLOUR-TRUE-VA	Water	Colour (True) by Spectrometer	BCMOE Colour Single Wavelength

This analysis is carried out using procedures adapted from British Columbia Environmental Manual "Colour- Single Wavelength." Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method.
Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Concurrent measurement of sample pH is recommended.

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.

F-IC-N-VA	Water	Fluoride in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

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.

HG-TOT-CVAFS-VA	Water	Total Hg in Water by CVAFS LOR=50ppt	EPA 1631E (mod)

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 a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

IONBALANCE-VA	Water	Ion Balance Calculation	APHA 1030E

Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.

Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:

Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]

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-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.

NH3-F-VA	Water	Ammonia in Water by Fluorescence	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NH3-F-VA	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

Reference Information

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-L-IC-N-VA	Water	Nitrite in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-L-IC-N-VA	Water	Nitrate in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

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.

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.

TDS-CALC-VA	Water	TDS (Calculated)	APHA 1030E (20TH EDITION)

This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".
The Total Dissolved Solids result is calculated from measured concentrations of anions and cations in the sample.

TDS-VA	Water	Total Dissolved Solids by Gravimetric	APHA 2540 C - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.
Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** 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
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

Reference Information

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 wwt - 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.

Whitehorse Receive

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L1856464-COFC

COC Number: 14 -

Page 1 of 3

Report To	
Company:	EDI
Contact:	Lyndsay Doetzel
Address:	2195 - 2nd Avenue Whitehorse, YT Y1A 3T8
Phone:	867-393-4882

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 ldoetzel@edynamics.com

Email 2 Emilie.Hamm@gov.yk.ca

Email 3 erik.pit@gov.yk.ca

Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)

- R ☑ Regular (Standard TAT if received by 3 pm - business days)
- P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
- E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
- E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and 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:	EDI	
Contact:	S Jenner	

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax sjenner@edynamics.com

Email 2 ldoetzel@edynamics.com

Project Information

ALS Quote #:	Q55559
Job #:	MOUNT NANSEN 16-Y-0089
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

Approver ID:	Cost Center:
GL Account:	Routing Code:
Activity Code:	
Location:	

ALS Lab Work Order # (lab use only) [redacted]

ALS Contact: Craig Flaherty Sampler:

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

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	ALK-PCT-VA,EC-PCT-VA,PH-PCT-VA	ANIONS-ALL-IC-WR,TSS-MAN-WR	CN-WAD-CFA-VA,CN-T-CFA-VA (P)	CN-CNO-WT (P)	CN-SCN-VA (P)	NH3-F-VA (P)	MET-T-BCMDG-VA (P)	MET-D-BCMDG-VA (F/P)	IONBALANC-VA, TDS-CALC-VA					Number of Containers
[redacted]	WQ-DC-U	07-Nov-16	15:50	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-VC-U	08-Nov-16	13:30	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-DX+105	08-Nov-16	16:30	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-DC-B	08-Nov-16	08:50	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-DX+105-r	08-Nov-16	16:45	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-VC-DBC	08-Nov-16	13:05	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-DC-R	07-Nov-16	15:20	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	TRAVEL BLANK	20 July 16	–	water														7

Short Holding Time

Rush Processing

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 ☐

INITIAL COOLER TEMPERATURES °C: 15.7 / 17.0 FINAL COOLER TEMPERATURES °C: 3 / 4

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: JM	Date: Nov 9	Time: 13:40	Received by: [redacted]	Date: 9 Nov 16	Time: 13:45	Received by: [illegible]	Date: 11/16	Time: 12:10

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326e v09 Front/04 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.

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1856464-COFC

COC Number: 14 -

Page 2 of 3

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	EDI	Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Lyndsay Doetzel	Quality Control (QC) Report with Report	☐ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	2195 - 2nd Avenue Whitehorse, YT Y1A 3T8	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
		Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	867-393-4882	Email 1 or Fax	ldoetzel@edynamics.com	Specify Date Required for E2,E or P:
		Email 2	Emilie.Hamm@gov.yk.ca	
		Email 3	erik.pit@gov.yk.ca	

Invoice To	Same as Report To ☑ Yes ☑ No	Invoice Distribution	
	Copy of Invoice with Report ☑ Yes ☐ No	Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Company:	EDI	Email 1 or Fax	sjenner@edynamics.com
Contact:	S Jenner	Email 2	ldoetzel@edynamics.com
Project Information		**Oil and Gas Required Fields (client use)**	
ALS Quote #:	Q55559	Approver ID:	Cost Center:
Job #:	MOUNT NANSEN 16-Y-0089	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): [redacted] **ALS Contact:** Craig Flaherty **Sampler:**

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

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	ALK-PCT-VA,EC-PCT-VA,PH-PCT-VA	ANIONS-ALL-IC-WR,TSS-MAN-WR	CN-WAD-CFA-VA,CN-T-CFA-VA	CN-CNO-WT	CN-SCN-VA	NH3-F-VA	MET-T-BCMDG-VA	MET-D-BCMDG-VA	IONBALANC-VA,TDS-CALC-VA					Number of Containers
							P	P	P	P	P	F/P						
[redacted]	WQ - TP	07-Nov-16	17:55	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ - DC - U - T	07-Nov-16	16:00	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ - VC - UMN	08-Nov-16	10:25	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ - VC - R+150	07-Nov-16	13:55	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ - SEEP	07-Nov-16	17:30	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ - Field BLANK	09-Nov-16	09:45	Water	R	R	R	R	R	R	R	R	R					9
[redacted]		-Nov-16		Water	R	R	R	R	R	R	R	R	R					9

Short Holding Time

Rush Processing

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No	
Are samples for human drinking water use? ☐ Yes ☐ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen		SIF Observations	Yes ☐	No ☐
Ice packs	Yes ☐	No ☐	Custody seal intact	Yes ☐	No ☐
Cooling Initiated	☐			

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C	
5.0	11.5	[redacted]	[redacted]	5.0	4

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: JM	Date: Nov 9	Time: 13:40	Received by: [redacted]	Date: [redacted]	Time: [redacted]	Received by: [redacted]	Date: [redacted]	Time: 16:10

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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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.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1856464-COFC

COC Number: 14 -

Page 3 of 3

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	EDI	Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Lyndsay Doetzel	Quality Control (QC) Report with Report	☐ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	2195 - 2nd Avenue Whitehorse, YT Y1A 3T8	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
		Select Distribution:	☐ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	867-393-4882	Email 1 or Fax	ldoetzel@edynamics.com	Specify Date Required for E2, E or P:
		Email 2	Emilie.Hamm@gov.yk.ca	
		Email 3	erik.pit@gov.yk.ca	

Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution		Analysis Request
	Copy of Invoice with Report ☑ Yes ☐ No	Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
Company:	EDI	Email 1 or Fax	sjenner@edynamics.com	
Contact:	S Jenner	Email 2	ldoetzel@edynamics.com	
Project Information		[redacted] Oil and Gas Required Fields (client use)		
ALS Quote #:	Q55556	Approver ID:	Cost Center:	
Job #:	MOUNT NANSEN 16-Y-0089	GL Account:	Routing Code:	
PO / AFE:		Activity Code:		
LSD:		Location:		
[redacted] ALS Lab Work Order # (lab use only)		ALS Contact: Craig Flaherty	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	FULL-TOT-DW-WR	Number of Containers
[redacted]	WQ-PW	09 - Nov-16	09:45	Water	R	3

Short Holding Time

Rush Processing

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)	[redacted] SAMPLE CONDITION AS RECEIVED (lab use only)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No		Frozen ☐ SIF Observations ☐ Yes ☐ No Ice packs ☐ Yes ☐ No ☐ Custody seal intact ☐ Yes ☐ No Cooling Initiated ☐
Are samples for human drinking water use? ☑ Yes ☐ No		INITIAL COOLER TEMPERATURES °C: [redacted] FINAL COOLER TEMPERATURES °C: [redacted]

SHIPMENT RELEASE (client use)			[redacted] INITIAL SHIPMENT RECEPTION (lab use only)			[redacted] FINAL SHIPMENT RECEPTION (lab use only)		
Released by: SM	Date: Nov 9	Time: 13:40	Received by: [redacted]	Date: 9-Nov-16	Time: 13:40	Received by: [redacted]	Date: 11/10	Time: 12:10

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326a v09 Front/04 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**.