ENVIRONMENTAL DYNAMICS INC.

2195 – 2ND Ave
Whitehorse, YT Y1A 3T8
P: (867) 393-4882 ▪ F: (867) 393-4883

March 19, 2014

EDI Job Number: 13-Y-0452

Assessment and Abandoned Mines
Yukon Government
Box 2703, K-419
Whitehorse, YT Y1A 2C6

Attention: Adrienne Turcotte, Project Officer

Re: Faro Rose Creek Surface and Groundwater Sampling Field Program – Trip 16

In response to an urgent request by Assessment and Abandoned Mines (AAM), EDI Environmental Dynamics Inc. (EDI) has been conducting on-going water quality sampling and fish telemetry surveys at the Faro Mine Site since November 2013. Table 1, attached, summarizes the field trips completed. The intent of this memo is to summarize field data obtained during the March 11, 2014 field program, referred to as Trip 16.

The objective of Trip 16 was to conduct surface water sampling at 12 monitoring sites, including QA/QC samples. Figure 1 provides the locations of all sampling sites. Table 2 summarizes field data collected at each sampling site.

Weather conditions on March 11, 2014 were mild, with temperatures near +1°C, clear skies and sunshine. All sites were sampled. Similar to the previous trip, samples were collected from NF2-A; however, there did not appear to be any flow at this site. Similar to the previous trip, the following sample locations were modified:

- NF1 samples were collected closer to the rock drain; and,
- NF2-B samples were collected approximately 7 m from the original site, towards NF2-A.

Representative photos of each site are attached. ALS laboratory analytical reports for all water chemistry samples submitted during this field trip are attached.

If you have any questions or concerns, please do not hesitate to contact Pat Tobler or myself at (867) 393-4882 or through email at mkearns@edynamics.com.

Yours truly,

EDI Environmental Dynamics Inc.

Submitted via email

Meighan Kearns, B.Sc., R.P.Bio.
Aquatic Biologist

Attachments:

- Table 1. Summary of Trips 1 to 16, Faro Mine Site.
- Table 2. Surface water sampling field data, Trip 16, March 11, 2014.
- Figure 1. Location of surface water sampling, Faro Mine Site, March 11, 2014.
- Photos 1 – 12. Representative site photos.
- ALS Laboratory Analytical Reports

Table 1. Summary of Trips 1 to 16, Faro Mine Site.

Trip No.	Dates	General Tasks
1	Nov 12 – 14, 2013	• Fish telemetry • Piezometer water depth measurements • Ground water sampling • Surface water sampling
2	Nov 25 – 28, 2013	• Fish telemetry • Surface water sampling • Aquatic toxicity (bioassay) sampling
3	Dec 10, 2013	• Fish telemetry
4	Dec 19 – 20, 2013	• Surface water sampling
5	Dec 27, 2013	• Surface water sampling
6	Jan 2, 2014	• Surface water sampling
7	Jan 7 – 8, 2014	• Fish telemetry • Surface water sampling
8	Jan 14 – 15, 2014	• Surface water sampling • Fish telemetry
9	Jan 21, 2014	• Surface water sampling
10	Jan 28 – 29, 2014	• Surface water sampling • Fish telemetry
11	Feb 5, 2014	• Surface water sampling
12	Feb 11 & 13, 2014	• Surface water sampling
13	Feb 18, 2014	• Surface water sampling
14	Feb 25, 2014	• Surface water sampling • Aquatic toxicity (bioassay) sampling
15	Mar 5, 2014	• Surface water sampling
16	Mar 11, 2014	• Surface water sampling

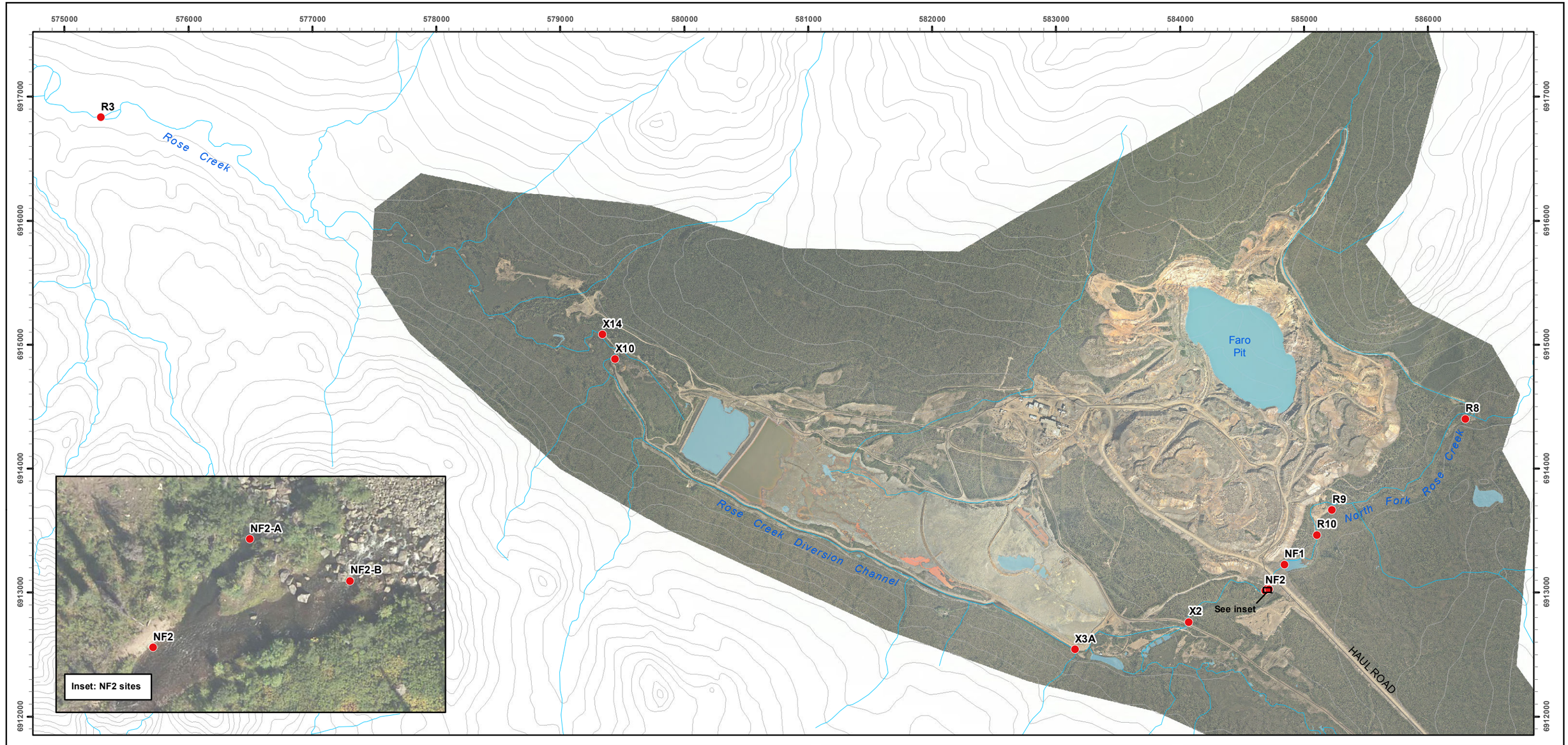
Table 2. Surface water sampling field data, March 11, 2014.

Site Name	UTM Location		Sample		QA/ QC Rep. ID	In-situ Parameters			
	Easting	Northing	Date	Time		Temp (°C)	SPC (µS/cm)	pH	Turbidity (NTU)
R3	575288	6916836	11-Mar-14	13:30	-	0.00	753.9	7.20	1.04
X14	579340	6915077	11-Mar-14	14:00	X14-r	0.40	662.7	7.25	1.87
X10	579452	6914881	11-Mar-14	14:20	-	0.00	375.8	7.36	0.70
X3A	583147	6912534	11-Mar-14	14:40	-	0.50	596.8	7.36	0.27
X2	584070	6912765	11-Mar-14	14:55	-	0.00	365.7	7.22	1.00
NF2-A	584709	6913033	11-Mar-14	15:10	-	0.10	1277	7.83	2.89
NF2-B [a]	584726	6913028	11-Mar-14	15:25	-	0.00	326.9	7.43	1.18
NF2	584690	6913012	11-Mar-14	15:40	-	0.00	311.6	7.22	2.85
NF1 [b]	584842	6913224	11-Mar-14	16:25	-	0.00	318.2	7.46	1.50
R10	585109	6913475	11-Mar-14	17:00	-	0.00	312.8	7.41	1.26
R9	585224	6913601	11-Mar-14	17:15	-	0.00	310.8	7.60	0.62
R8	586299	6914403	11-Mar-14	17:30	-	0.00	279.1	7.61	0.83

Where, UTM = Universal Transverse Mercator, NAD 83, Zone 8;
QA/QC Rep = Quality Assurance/ Quality Control Replicate;
Temp = water temperature; and,
SPC = specific conductance.

Notes: [a] Samples were collected approximately 7 m from the original site, towards NF2-A; and,
[b] Samples were collected in close proximity to original site, closer to the rock drain.

Location of surface water sampling, Faro Mine Site, March 11, 2014



Legend

- Surface Water Sample Collected
- Road (Mine Access/Haul)
- Topographic Contour (30 m Interval)

N
W E
S

0 500 1,000 1,500 2,000
metres

Map Scale = 1:30,000 (printed on 11 x 17)
Map Projection: North American Datum 1983 UTM Zone 8N

Data sources

1:50,000 topographic spatial data provided by Geomatics - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

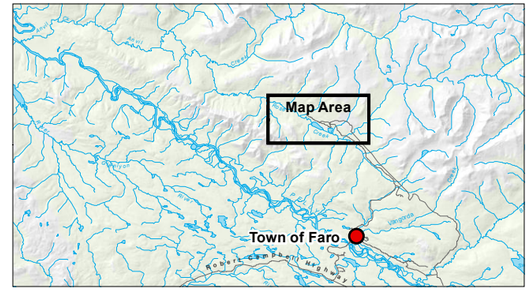
National Road Network courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Detailed toppgraphic features of the Faro, Grum and Vangorda mine sites were provided by Yukon Government - Energy, Mines and Resources - Assessment and Abandoned Mines Branch (March 2012).

Project data displayed is site specific. Data collected by EDI Environmental Dynamics Inc. was obtained using Garmin GPS technology.

This document is not an official land survey and the spatial data presented is subject to change.

Drawn:	Checked:		
LG	MK	FIGURE 1	Date: 18/03/2014



EDI

Map Prepared by
EDI Environmental Dynamics Inc.

Path: J:\Yukon\Projects\2013\13_Y_0452_AAM_NF_Sampling\Mapping\March\Fig1_WaterSampling_11Mar2014.mxd

Site Photos

Photo 1. Overview at surface water sampling site R3, March 11, 2014.

Photo 2. Overview at surface water sampling site X14, March 11, 2014.

Photo 3. Overview at surface water sampling site X10, March 11, 2014.

Photo 4. Downstream view at surface water sampling site X3A, March 11, 2014.

Photo 5. Overview at surface water sampling site X2, March 11, 2014.

Photo 6. Overview at surface water sampling site NF2-A, March 11, 2014.

Photo 7. Downstream view from surface water sampling site NF2-B, March 11, 2014.

Photo 8. Overview at surface water sampling site NF2, March 11, 2014.

Photo 9. Overview from surface water sampling site NF1, overflow in photo is a result of the auger hole, March 11, 2014.

Photo 10. Overview from surface water sampling site R10, March 11, 2014.

Photo 11. Downstream view at surface water sampling site R9, March 11, 2014.

Photo 12. Overview at surface water sampling site R8, March 11, 2014.

ENVIRONMENTAL DYNAMICS INC.
ATTN: Meighan Kearns
2195 - 2nd Avenue
Whitehorse YT Y1A 3T8

Date Received: 12-MAR-14
Report Date: 17-MAR-14 16:46 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1431528

Project P.O. #: NOT SUBMITTED
Job Reference: 13-Y-0452/14-Y-0270
C of C Numbers: 1, 2
Legal Site Desc:

Can Dang
Senior Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1431528-1	L1431528-2	L1431528-3	L1431528-4	L1431528-5
	Description	Grab	Grab	Grab	Grab	Grab
	Sampled Date	11-MAR-14	11-MAR-14	11-MAR-14	11-MAR-14	11-MAR-14
	Sampled Time	13:30	14:00	14:20	14:40	14:55
	Client ID	R3	X14	X10	X3A	X2
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	700	901	358	529	355
	Hardness (as CaCO3) (mg/L)	349	503	166	289	166
	pH (pH)	7.57	7.51	7.69	7.58	7.39
	Total Suspended Solids (mg/L)	<1.0	3.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	469	686	206	328	213
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	180	212	159	235	163
	Ammonia, Total (as N) (mg/L)	0.0464	0.123 DLA	<0.0050	0.0140	0.0090
	Chloride (Cl) (mg/L)	<0.50	<2.5 DLA	<0.50	0.58	<0.50
	Fluoride (F) (mg/L)	0.129	0.20	0.184	0.288	0.205
	Nitrate (as N) (mg/L)	0.259	0.240 DLA	0.313	0.519	0.328
	Nitrite (as N) (mg/L)	0.0012	<0.0050	<0.0010	0.0016	0.0011
	Phosphorus (P)-Total (mg/L)	<0.0020	<0.0020	<0.0020	0.0022	<0.0020
	Sulfate (SO4) (mg/L)	223	356	44.2	70.1	47.1
	Anion Sum (meq/L)	8.26	11.7	4.12	6.21	4.26
	Cation Sum (meq/L)	7.38	10.8	3.52	6.11	3.56
	Cation - Anion Balance (%)	-5.6	-4.0	-7.9	-0.8	-9.0
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.25	1.63	1.65	2.87	1.55
	Total Organic Carbon (mg/L)	1.46	1.70	1.49	2.88	1.56
Total Metals	Aluminum (Al)-Total (mg/L)	0.0058	0.0165	0.0055	0.0075	0.0180
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	0.00011	<0.00010
	Arsenic (As)-Total (mg/L)	0.00022	0.00044	0.00025	0.00042	0.00044
	Barium (Ba)-Total (mg/L)	0.0869	0.0720	0.0791	0.120	0.0743
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000113	0.000281	0.000305	0.000536	0.000637
	Calcium (Ca)-Total (mg/L)	110	148	49.9	78.9	48.3
	Chromium (Cr)-Total (mg/L)	0.00012	0.00013	<0.00010	0.00013	<0.00010
	Cobalt (Co)-Total (mg/L)	0.00158	0.00484	0.00091	0.00367	0.00449
	Copper (Cu)-Total (mg/L)	<0.00050	<0.00050	<0.00050	0.00080	<0.00050
	Iron (Fe)-Total (mg/L)	0.107	0.900	0.106	0.111	0.304
	Lead (Pb)-Total (mg/L)	0.000141	0.000172	0.000579	0.000168	0.000460
	Lithium (Li)-Total (mg/L)	0.00622	0.00976	0.00733	0.0112	0.00887
	Magnesium (Mg)-Total (mg/L)	22.9	32.6	12.7	19.5	12.6
	Manganese (Mn)-Total (mg/L)	2.19	6.48	0.0976	0.428	0.316
	Molybdenum (Mo)-Total (mg/L)	0.000489	0.000835	0.000673	0.00155	0.000887

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1431528-6	L1431528-7	L1431528-8	L1431528-9	L1431528-10
	Description	Grab	Grab	Grab	Grab	Grab
	Sampled Date	11-MAR-14	11-MAR-14	11-MAR-14	11-MAR-14	11-MAR-14
	Sampled Time	15:10	15:25	15:40	16:25	17:00
	Client ID	NF2-A	NF2-B	NF2	NF1	R10
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	1050	314	332	302	301
	Hardness (as CaCO3) (mg/L)	670	151	159	148	146
	pH (pH)	8.00	7.69	7.39	7.53	7.77
	Total Suspended Solids (mg/L)	2.0	<1.0	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	755	175	190	169	166
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	541	139	141	139	137
	Ammonia, Total (as N) (mg/L)	0.0308	<0.0050	0.0092	0.0077	0.0053
	Chloride (Cl) (mg/L)	<5.0 DLA	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.69	0.187	0.210	0.184	0.182
	Nitrate (as N) (mg/L)	1.86	0.328	0.391	0.350	0.305
	Nitrite (as N) (mg/L)	<0.010 DLA	<0.0010	0.0011	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)	0.0103	0.0040	0.0041	0.0042	0.0047
	Sulfate (SO4) (mg/L)	154	29.0	39.7	25.0	24.1
	Anion Sum (meq/L)	14.2	3.42	3.68	3.33	3.28
	Cation Sum (meq/L)	14.3	3.21	3.40	3.13	3.09
	Cation - Anion Balance (%)	0.5	-3.1	-3.9	-3.1	-3.0
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	5.82	1.34	1.43	1.31	1.20
	Total Organic Carbon (mg/L)	5.91	1.42	1.53	1.36	1.35
Total Metals	Aluminum (Al)-Total (mg/L)	0.0342	0.0124	0.0185	0.0063	0.0093
	Antimony (Sb)-Total (mg/L)	0.00027	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00131	0.00045	0.00048	0.00048	0.00051
	Barium (Ba)-Total (mg/L)	0.237	0.0765	0.0779	0.0750	0.0774
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000981	0.000175	0.000682	0.000016	0.000012
	Calcium (Ca)-Total (mg/L)	167	44.8	47.1	43.3	43.8
	Chromium (Cr)-Total (mg/L)	0.00056	<0.00010	0.00014	<0.00010	0.00011
	Cobalt (Co)-Total (mg/L)	0.00770	0.00124	0.00489	0.00019	<0.00010
	Copper (Cu)-Total (mg/L)	0.00205	<0.00050	<0.00050	<0.00050	<0.00050
	Iron (Fe)-Total (mg/L)	0.208	0.155	0.279	0.121	0.121
	Lead (Pb)-Total (mg/L)	0.00113	0.000388	0.000471	0.000114	0.000069
	Lithium (Li)-Total (mg/L)	0.0328	0.00828	0.00892	0.00806	0.00802
	Magnesium (Mg)-Total (mg/L)	42.7	10.2	12.0	9.34	9.29
	Manganese (Mn)-Total (mg/L)	0.433	0.0819	0.291	0.0376	0.0239
	Molybdenum (Mo)-Total (mg/L)	0.00365	0.000857	0.000922	0.000882	0.000882

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1431528-11 Grab 11-MAR-14 17:15 R9	L1431528-12 Grab 11-MAR-14 17:30 R8	L1431528-13 Grab 11-MAR-14 18:35 FIELD BLANK	L1431528-14 Grab 12-MAR-14 12:45 TRAVEL BLANK	L1431528-15 Grab 11-MAR-14 14:00 X-14-R
WATER						
Physical Tests	Conductivity (uS/cm)	296	272	<2.0	<2.0	924
	Hardness (as CaCO3) (mg/L)	146	130	<0.50	<0.50	505
	pH (pH)	7.87	7.79	5.94	5.67	7.50
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<1.0	1.4
	Total Dissolved Solids (mg/L)	167	146	<1.0	<1.0	703
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	139	137	<2.0	<2.0	211
	Ammonia, Total (as N) (mg/L)	0.0050	0.0057	<0.0050	<0.010 RRV	0.138
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<2.5 DLA
	Fluoride (F) (mg/L)	0.182	0.179	<0.020	<0.020	0.21
	Nitrate (as N) (mg/L)	0.308	0.188	<0.0050	<0.0050	0.248
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050 DLA
	Phosphorus (P)-Total (mg/L)	0.0047	0.0053	<0.0020	<0.0020	<0.0020
	Sulfate (SO4) (mg/L)	23.7	10.4	<0.50	<0.50	373
	Anion Sum (meq/L)	3.30	2.97	<0.10	<0.10	12.0
	Cation Sum (meq/L)	3.08	2.76	<0.10	<0.10	10.8
	Cation - Anion Balance (%)	-3.3	-3.7	0.0	0.0	-5.1
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	1.28	1.24	<0.50		1.35
	Total Organic Carbon (mg/L)	1.42	1.38	<0.50	<0.50	1.46
Total Metals	Aluminum (Al)-Total (mg/L)	0.0107	0.0064	<0.0030	<0.0030	0.0204
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00052	0.00057	<0.00010	<0.00010	0.00045
	Barium (Ba)-Total (mg/L)	0.0742	0.0758	<0.000050	<0.000050	0.0711
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	0.000272
	Calcium (Ca)-Total (mg/L)	44.2	39.5	<0.020	<0.020	153
	Chromium (Cr)-Total (mg/L)	0.00011	<0.00010	<0.00010	<0.00010	0.00011
	Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	0.00478
	Copper (Cu)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Iron (Fe)-Total (mg/L)	0.117	0.132	<0.010	<0.010	0.914
	Lead (Pb)-Total (mg/L)	0.000151	<0.000050	<0.000050	<0.000050	0.000227
	Lithium (Li)-Total (mg/L)	0.00801	0.00750	<0.00050	<0.00050	0.00965
	Magnesium (Mg)-Total (mg/L)	9.05	7.35	<0.0050	<0.0050	32.8
	Manganese (Mn)-Total (mg/L)	0.0210	0.0199	<0.000050	<0.000050	6.63
	Molybdenum (Mo)-Total (mg/L)	0.000918	0.000905	<0.000050	<0.000050	0.000784

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1431528-1	L1431528-2	L1431528-3	L1431528-4	L1431528-5
	Description	Grab	Grab	Grab	Grab	Grab
	Sampled Date	11-MAR-14	11-MAR-14	11-MAR-14	11-MAR-14	11-MAR-14
	Sampled Time	13:30	14:00	14:20	14:40	14:55
	Client ID	R3	X14	X10	X3A	X2
Grouping	**Analyte**					
WATER						
Total Metals	Nickel (Ni)-Total (mg/L)	0.00472	0.0123	0.00476	0.00735	0.00714
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	1.86	2.43	1.26	2.44	1.22
	Selenium (Se)-Total (mg/L)	0.00041	0.00042	0.00043	0.00065	0.00042
	Silicon (Si)-Total (mg/L)	5.90	6.62	5.90	8.78	6.06
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	6.30	9.40	3.28	5.47	3.67
	Strontium (Sr)-Total (mg/L)	0.344	0.440	0.223	0.368	0.211
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.00281	0.00374	0.00288	0.00463	0.00280
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	0.151	0.391	0.635	0.940	1.08
	Zirconium (Zr)-Total (mg/L)	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	<0.0010	0.0011	0.0017	0.0013	0.0029
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	0.00010	<0.00010
	Arsenic (As)-Dissolved (mg/L)	0.00013	0.00031	0.00014	0.00032	0.00018
	Barium (Ba)-Dissolved (mg/L)	0.0878	0.0683	0.0803	0.127	0.0750
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.000117	0.000268	0.000288	0.000545	0.000639
	Calcium (Ca)-Dissolved (mg/L)	102	149	46.3	81.5	46.4
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Cobalt (Co)-Dissolved (mg/L)	0.00155	0.00464	0.00085	0.00378	0.00439
	Copper (Cu)-Dissolved (mg/L)	0.00034	0.00027	0.00031	0.00058	0.00025
	Iron (Fe)-Dissolved (mg/L)	<0.010	0.732	0.012	<0.010	0.079
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.00610	0.00958	0.00703	0.0119	0.00913
	Magnesium (Mg)-Dissolved (mg/L)	23.0	31.5	12.4	20.6	12.2
	Manganese (Mn)-Dissolved (mg/L)	2.20	6.31	0.0942	0.448	0.301
	Molybdenum (Mo)-Dissolved (mg/L)	0.000444	0.000731	0.000599	0.00123	0.000783
	Nickel (Ni)-Dissolved (mg/L)	0.00470	0.0119	0.00461	0.00740	0.00691
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	1.88	2.36	1.25	2.48	1.18

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1431528-6 Grab 11-MAR-14 15:10 NF2-A	L1431528-7 Grab 11-MAR-14 15:25 NF2-B	L1431528-8 Grab 11-MAR-14 15:40 NF2	L1431528-9 Grab 11-MAR-14 16:25 NF1	L1431528-10 Grab 11-MAR-14 17:00 R10
WATER						
Total Metals	Nickel (Ni)-Total (mg/L)	0.0134	0.00211	0.00730	<0.00050	<0.00050
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	5.04	1.14	1.20	1.11	1.10
	Selenium (Se)-Total (mg/L)	0.00182	0.00043	0.00044	0.00046	0.00045
	Silicon (Si)-Total (mg/L)	21.9	6.15	6.14	5.94	5.98
	Silver (Ag)-Total (mg/L)	0.000024	<0.000010	0.000013	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	16.2	3.49	3.61	3.40	3.30
	Strontium (Sr)-Total (mg/L)	0.768	0.199	0.207	0.196	0.193
	Thallium (Tl)-Total (mg/L)	0.000022	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Total (mg/L)	0.00014	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.0108	0.00286	0.00292	0.00280	0.00278
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	1.49	0.284	1.14	0.0115	0.0051
	Zirconium (Zr)-Total (mg/L)	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0016	0.0022	0.0042	0.0017	0.0015
	Antimony (Sb)-Dissolved (mg/L)	0.00026	<0.00010	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Dissolved (mg/L)	0.00110	0.00025	0.00032	0.00035	0.00038
	Barium (Ba)-Dissolved (mg/L)	0.254	0.0752	0.0787	0.0753	0.0759
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.00109	0.000175	0.000697	0.000015	0.000012
	Calcium (Ca)-Dissolved (mg/L)	188	44.5	44.5	43.7	43.2
	Chromium (Cr)-Dissolved (mg/L)	0.00013	<0.00010	<0.00010	<0.00010	<0.00010
	Cobalt (Co)-Dissolved (mg/L)	0.00845	0.00121	0.00465	0.00018	<0.00010
	Copper (Cu)-Dissolved (mg/L)	0.00144	0.00024	0.00026	0.00024	0.00022
	Iron (Fe)-Dissolved (mg/L)	<0.010	0.040	0.126	0.028	0.022
	Lead (Pb)-Dissolved (mg/L)	0.000119	<0.000050	0.000057	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.0341	0.00845	0.00891	0.00841	0.00834
	Magnesium (Mg)-Dissolved (mg/L)	48.7	9.71	11.5	9.44	9.22
	Manganese (Mn)-Dissolved (mg/L)	0.492	0.0785	0.278	0.0368	0.0216
	Molybdenum (Mo)-Dissolved (mg/L)	0.00350	0.000814	0.000806	0.000863	0.000851
	Nickel (Ni)-Dissolved (mg/L)	0.0148	0.00204	0.00699	<0.00050	<0.00050
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Dissolved (mg/L)	5.44	1.11	1.14	1.11	1.08

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1431528-11	L1431528-12	L1431528-13	L1431528-14	L1431528-15
	Description	Grab	Grab	Grab	Grab	Grab
	Sampled Date	11-MAR-14	11-MAR-14	11-MAR-14	12-MAR-14	11-MAR-14
	Sampled Time	17:15	17:30	18:35	12:45	14:00
	Client ID	R9	R8	FIELD BLANK	TRAVEL BLANK	X-14-R
Grouping	**Analyte**					
WATER						
Total Metals	Nickel (Ni)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	0.0121
	Phosphorus (P)-Total (mg/L)	<0.30	<0.30	<0.30	<0.30	<0.30
	Potassium (K)-Total (mg/L)	1.08	1.00	<0.050	<0.050	2.41
	Selenium (Se)-Total (mg/L)	0.00048	0.00042	<0.00010	<0.00010	0.00043
	Silicon (Si)-Total (mg/L)	5.89	5.94	<0.050	<0.050	6.41
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	3.26	3.18	<0.050	<0.050	9.51
	Strontium (Sr)-Total (mg/L)	0.193	0.180	<0.00020	<0.00020	0.445
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Total (mg/L)	0.00279	0.00255	<0.000010	<0.000010	0.00377
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030	<0.0030	<0.0030	0.388
	Zirconium (Zr)-Total (mg/L)	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD		FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0012	<0.0010	<0.0010		0.0010
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010		<0.00010
	Arsenic (As)-Dissolved (mg/L)	0.00036	0.00040	<0.00010		0.00029
	Barium (Ba)-Dissolved (mg/L)	0.0756	0.0749	<0.000050		0.0696
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010		<0.00010
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		<0.00050
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010		<0.010
	Cadmium (Cd)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010		0.000268
	Calcium (Ca)-Dissolved (mg/L)	43.4	39.7	<0.020		149
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010		<0.00010
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010		0.00465
	Copper (Cu)-Dissolved (mg/L)	0.00021	<0.00020	<0.00020		0.00028
	Iron (Fe)-Dissolved (mg/L)	0.020	0.031	<0.010		0.732
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050		<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.00811	0.00788	<0.00050		0.00958
	Magnesium (Mg)-Dissolved (mg/L)	9.05	7.53	<0.0050		32.0
	Manganese (Mn)-Dissolved (mg/L)	0.0188	0.0187	<0.000050		6.44
	Molybdenum (Mo)-Dissolved (mg/L)	0.000839	0.000831	<0.000050		0.000728
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050		0.0119
	Phosphorus (P)-Dissolved (mg/L)	<0.30	<0.30	<0.30		<0.30
	Potassium (K)-Dissolved (mg/L)	1.08	1.02	<0.050		2.39

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1431528-1	L1431528-2	L1431528-3	L1431528-4	L1431528-5
	Description	Grab	Grab	Grab	Grab	Grab
	Sampled Date	11-MAR-14	11-MAR-14	11-MAR-14	11-MAR-14	11-MAR-14
	Sampled Time	13:30	14:00	14:20	14:40	14:55
	Client ID	R3	X14	X10	X3A	X2
Grouping	**Analyte**					
WATER						
Dissolved Metals	Selenium (Se)-Dissolved (mg/L)	0.00049	0.00050	0.00049	0.00085	0.00049
	Silicon (Si)-Dissolved (mg/L)	5.88	6.36	5.76	8.53	6.11
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	6.37	9.01	3.25	5.43	3.56
	Strontium (Sr)-Dissolved (mg/L)	0.318	0.438	0.202	0.363	0.207
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.00269	0.00375	0.00260	0.00464	0.00271
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.157	0.392	0.654	1.01	1.11
	Zirconium (Zr)-Dissolved (mg/L)	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1431528-6 Grab 11-MAR-14 15:10 NF2-A	L1431528-7 Grab 11-MAR-14 15:25 NF2-B	L1431528-8 Grab 11-MAR-14 15:40 NF2	L1431528-9 Grab 11-MAR-14 16:25 NF1	L1431528-10 Grab 11-MAR-14 17:00 R10
WATER						
Dissolved Metals	Selenium (Se)-Dissolved (mg/L)	0.00212	0.00050	0.00053	0.00052	0.00052
	Silicon (Si)-Dissolved (mg/L)	24.2	6.14	6.09	6.02	5.79
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	16.6	3.40	3.32	3.28	3.25
	Strontium (Sr)-Dissolved (mg/L)	0.843	0.195	0.197	0.194	0.189
	Thallium (Tl)-Dissolved (mg/L)	0.000023	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Dissolved (mg/L)	0.00020	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.0119	0.00272	0.00276	0.00279	0.00275
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	1.73	0.294	1.15	0.0118	0.0055
	Zirconium (Zr)-Dissolved (mg/L)	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1431528-11	L1431528-12	L1431528-13	L1431528-14	L1431528-15
	Description	Grab	Grab	Grab	Grab	Grab
	Sampled Date	11-MAR-14	11-MAR-14	11-MAR-14	12-MAR-14	11-MAR-14
	Sampled Time	17:15	17:30	18:35	12:45	14:00
	Client ID	R9	R8	FIELD BLANK	TRAVEL BLANK	X-14-R
Grouping	**Analyte**					
WATER						
Dissolved Metals	Selenium (Se)-Dissolved (mg/L)	0.00050	0.00048	<0.00010		0.00051
	Silicon (Si)-Dissolved (mg/L)	5.85	5.96	<0.050		6.26
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010		<0.000010
	Sodium (Na)-Dissolved (mg/L)	3.27	3.16	<0.050		9.20
	Strontium (Sr)-Dissolved (mg/L)	0.190	0.175	<0.00020		0.446
	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)	<0.010	<0.010	<0.010		<0.010
	Uranium (U)-Dissolved (mg/L)	0.00276	0.00248	<0.000010		0.00367
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010		<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	0.0011	<0.0010		0.395
	Zirconium (Zr)-Dissolved (mg/L)	<0.00080	<0.00080	<0.00080		<0.00080

* 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	Calcium (Ca)-Dissolved	MS-B	L1431528-1, -10, -11, -12, -13, -15, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1431528-1, -10, -11, -12, -13, -15, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1431528-1, -10, -11, -12, -13, -15, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1431528-1, -10, -11, -12, -13, -15, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1431528-1, -10, -11, -12, -13, -15, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1431528-1, -10, -11, -12, -13, -15, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1431528-1, -10, -11, -12, -13, -15, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1431528-1, -10, -11, -12, -13, -15, -2, -3, -4, -5, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
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.

ANIONS-CL-IC-WR Water Chloride by Ion Chromatography EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.

ANIONS-F-IC-WR Water Fluoride by Ion Chromatography EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.

ANIONS-NO2-IC-WR Water Nitrite Nitrogen by Ion Chromatography EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. Nitrate is detected by UV absorbance.

ANIONS-NO3-IC-WR Water Nitrate Nitrogen by Ion Chromatography EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003. Nitrate is detected by UV absorbance.

ANIONS-SO4-IC-WR Water Sulphate by Ion Chromatography EPA 300.1

This analysis is carried out using procedures adapted from EPA Method 300.1, "Determination of Inorganic Anions by Ion Chromatography", Revision 1.0, April 1999 and from "Determination of Inorganic Anions in Environmental Waters Using a Hydroxide-Selective Column", Application Note 154 v.19, Dionex 2003.

CARBONS-DOC-VA Water Dissolved organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-TOC-VA Water Total organic carbon by combustion APHA 5310 TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

EC-MAN-WR Water Conductivity by Meter APHA 2510 (B)

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

HARDNESS-CALC-VA Water Hardness APHA 2340B

Reference Information

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.

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 3030 B&E / EPA SW-846 6020A

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 hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

MET-T-CCMS-VA Water Total Metals in Water by CRC ICPMS APHA 3030 B&E / EPA SW-846 6020A

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 hotblock, or filtration (APHA 3030B&E). Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

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

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.

P-T-COL-VA Water Total P in Water by Colour APHA 4500-P Phosphorous

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.

PH-MAN-WR Water pH by Meter APHA 4500-H (B)

"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."

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".

TSS-LOW-WR Water Total Suspended Solids by Grav. (1 mg/L) APHA 2540 D

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids are determined by filtering a sample through a glass fibre filter and drying the filter at 104 degrees celsius.

ZR-D-MS-VA Water Dissolved Zr in Water by ICPMS EPA SW-846 3005A/6020A

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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

ZR-T-MS-VA Water Total Zr in Water by ICPMS EPA SW-846 3005A/6020A

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, or filtration (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

** 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
WR	ALS ENVIRONMENTAL - WHITEHORSE, YUKON, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

1 2

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.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1431528-COFC

COC Number: 14 -

Page 1 of 1

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:	Meighan Kearns	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
Phone:	867-393-4882	Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
		Email 1 or Fax: mkearns@edynamics.com	Specify Date Required for E2,E or P:
		Email 2: adrienne.turcotte@gov.yk.ca	

Invoice To		Invoice Distribution	
	Same as Report To ☐ Yes ☑ No	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	
	Copy of Invoice with Report ☑ Yes ☐ No	Email 1 or Fax: sjenner@edynamics.com	
Company:	EDI	Email 2:	
Contact:	S Jenner		

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q38556	Approver ID:	Cost Center:
Job #:	13-Y-0452 / 14-Y-0270	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):		ALS Contact:	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-COL-VA,P-T-COL-VA,IONBALANCE-VA	ANIONS-ALL-IC-WR, TDS-CALC-VA	EC-MAN-WR,PH-MAN-WR	TSS-LOW-WR	CARBONS-TOC-VA,NH3-F-VA	CARBONS-DOC-VA	MET-T-CCMS-VA,ZR-T-MS-VA	MET-D-CCMS-VA,ZR-D-MS-VA	HARDNESS-CALC-VA	Number of Containers
	R3	11-MAR-14	13:30	GRAB	P	P	P	P	P	P	P	P	P	5
	X14	"	1400											
	X10	"	1420											
	X34	"	1440											
	X2	"	1455											
	NF2-A	"	1510											
	NF2-B	"	15:25											
	NF2	"	15:40											

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	Use CH2M_EQUIS for EDD.
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	4.4				

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Laura Grieve	Date: 12-MAR-14	Time:	Received by:	Date: 12-Mar-14	Time: 12:45	Received by:	Date:	Time:

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0328e v09 Front/04 January 2014

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.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1431528-COFC

COC Number: 14 -

Page 1 of 1

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:	Meighan Kearns	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 Select Distribution:	☐ EMAIL ☐ MAIL ☐ FAX	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
Phone:	867-393-4882	Email 1 or Fax	mkearns@edynamics.com	Specify Date Required for E2,E or P:
		Email 2	adrienne.turcotte@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		

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q38556	Approver ID:	Cost Center:
Job #:	13-Y-0452 /14-Y-0270	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		ALS Contact:	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-COL-VA,P-T-COL-VA,IONBALANCE-V	ANIONS-ALL-IC-WR, TDS-CALC-VA	EC-MAN-WR,PH-MAN-WR	TSS-LOW-WR	CARBONS-TOC-VA,NH3-F-VA	CARBONS-DOC-VA	MET-T-CCMS-VA,ZR-T-MS-VA	MET-D-CCMS-VA,ZR-D-MS-VA	HARDNESS-CALC-VA	Number of Containers
	NF1	11-MAR-14	1625	GRAB	P	P	P	P	P	P	P	P	P	5
	R10	"	1700	"	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
	R9	"	1715	"										
	R8	"	1730	"										
	FIELD BLANK	"	1835	"										
	TRAVEL BLANK	N/A	N/A	GRAB	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

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	Use CH2M_EQUIS for EDD.
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		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
Laura Grive	12-MAR-14							

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.