

Faro Pelly River Aquatics Program

August 12-13, 2013 Field Report



Prepared for:

Yukon

Energy Mines and Resources
Assessment and Abandoned Mines

Box 2703, K-419
Whitehorse, Yukon
Y1A 2C6

Prepared by:

EDI Environmental Dynamics Inc.
2195-2nd Avenue
Whitehorse, Yukon
Y1A 3T8

EDI Contact:

Meghan Marjanovic
Meighan Kearns
867-393-4882

EDI Project No:

13-Y-0199
October, 2013



PRINCE GEORGE • VANCOUVER • NANAIMO • GRANDE PRAIRIE • WHITEHORSE

www.edynamics.com

This page is intentionally blank.



EXECUTIVE SUMMARY

Yukon Government, Assessment and Abandoned Mines retained EDI Environmental Dynamics Inc. to conduct the Faro Pelly River Aquatics Program in 2013. This program involves three sampling events, spring, summer and fall. This report presents the methods and results for the summer sampling event conducted on August 12-13, 2013.

The Faro Pelly River Aquatics Program involves 22 monitoring stations at the Faro Mine Complex and surrounding area, including stations on the Pelly River, Van Gorder Creek (also known as Vangorda Creek), Rose Creek, Faro Creek, Anvil Creek, Dixon Creek, Reservoir Creek, and several unnamed watercourses. At each station in situ water quality measurements and samples for laboratory analysis were collected. Samples were analyzed for routine parameters, nutrients, total and dissolved organic carbon, and total and dissolved metals. Quality Assurance/Quality Control samples were also collected, including two duplicate samples, one field blank and one travel blank.

Water levels at the time of the spring sampling event had diminished significantly from the high water levels experienced during the June 2013 spring sampling event. Several sites that were inaccessible due to high waters in June 2013 were now accessible (example P1, P4, R5). Turbidity levels had also diminished from the spring sampling event.

Water temperatures, measured in the field, ranged from 4.0°C to 18.7°C. Specific conductivity in the field ranged from 36 µS/cm to 2,346 µS/cm and pH ranged from 6.34 to 8.26. All samples were submitted to ALS Laboratories upon arrival in Whitehorse, YT. Laboratory analyses results were compared to both Canadian Council of Ministers of the Environment Aquatic Life Guidelines and the Faro Effluent Quality Standards. There were exceedances of several parameters, including total suspended solids, fluoride, aluminum, cadmium, copper, iron, lead, selenium, and zinc. Seven out of twenty two stations did not have any chemical exceedances (GCULV, USFR, R1, R4, R5, R6, and V17A). The NWID station had the highest number of exceedances. Exceedances are likely attributed in part to naturally-high levels of mineralization in the area, while stations downstream of the influence of the mine, may be under the effect of historical mining activity or ongoing care and maintenance activities associated with the Faro Mine Complex.



AUTHORSHIP

This report was prepared by EDI Environmental Dynamics Inc. EDI staff who contributed to this report include:

Meghan Marjanovic, B.Sc., R.P.Bio., P.Biol. Primary Author

Pat Tobler, B.Sc., R.P.Bio., P.Biol.....Senior Review

Laura Grieve, B.Sc..... GIS Specialist

Field work was conducted by Meghan Marjanovic and Brodie Smith of EDI.



TABLE OF CONTENTS

1	INTRODUCTION	1
2	METHODOLOGY	4
2.1	FIELD METHODOLOGY	4
2.2	LABORATORY ANALYSIS	4
2.3	QA/QC PROGRAM.....	6
2.4	DATA ANALYSIS	7
3	RESULTS.....	10
3.1	FIELD AND LAB ANALYSIS RESULTS	10
3.2	QA/QC RESULTS	13
4	RECOMMENDATIONS.....	14
5	REFERENCES.....	15
5.1	SPATIAL DATA.....	15

LIST OF APPENDUCES

- APPENDIX A SITE PHOTOGRAPHS**
- APPENDIX B EDI FIELD DATA SHEETS**
- APPENDIX C LABORATORY ANALYSIS SUMMARY TABLE**
- APPENDIX D QA/QC RESULTS SUMMARY**
- APPENDIX E ALS CERTIFICATE OF ANALYSIS**

LIST OF TABLES

Table 1.	Summary of 2013 Faro Pelly River Aquatics Program surface water quality station locations, August 2013.....	2
Table 2.	List of parameters selected for laboratory analysis for the Faro Pelly River Aquatics Program (table continues to next page).....	5
Table 3.	QA/QC assessment categories and results.....	7



Table 4. List of applicable CCME guidelines for Aquatic Life (table continues to next page).....7

Table 5. Applicable Faro Effluent Quality Standards for the Faro Mine Complex.....9

Table 6. Summary of CCME Guideline or Faro Effluent Standard parameter exceedances, August 2013. 11

Table 7. Summary of in situ water quality parameter, August 2013..... 12

LIST OF FIGURES

Figure 1. Faro Pelly River Aquatics Program Surface Water Monitoring Stations, August 2013.3



1 INTRODUCTION

Yukon Government, Assessment and Abandoned Mines (AAM) retained the services of EDI Environmental Dynamics Inc. (EDI) in 2013 to conduct surface water quality sampling for the 2013 Faro Pelly River Aquatics Program. This program involves three sampling events, including a spring, summer and fall sampling trip. This report presents the field report for the summer sampling event, conducted from August 12 to August 13, 2013. The fall trip is scheduled for October 2013.

EDI conducted surface water quality sampling at 22 designated stations, which included sampling locations on the Pelly River, Anvil Creek, Rose Creek, Faro Creek, Dixon Creek, an unnamed creek draining the Grum ore transfer pad, and Van Gorder Creek (Table 1; Figure 1). Please note Van Gorder Creek will be referred to by its alternate name throughout this report, 'Vangorda Creek', as that is the name used by AAM for the Faro Mine Complex and Faro Mine Remediation Project, while Van Gorder Creek remains the official geographic name (Yukon Government Tourism and Culture 2010).

Of the 22 sampling locations, 13 are classified as receiving environment stations, seven are reference stations, and two are sampled for 'other' purposes (Table 1). At each station, samples were collected and in situ water quality parameters were measured, including water temperature, specific conductivity and pH. All samples were sent to an accredited laboratory for analysis of routine, organic carbon, metal and nutrient parameters. Quality Assurance/Quality Control (QA/QC) samples were also collected during the spring field visit, including duplicate samples, a field blank and a travel blank.

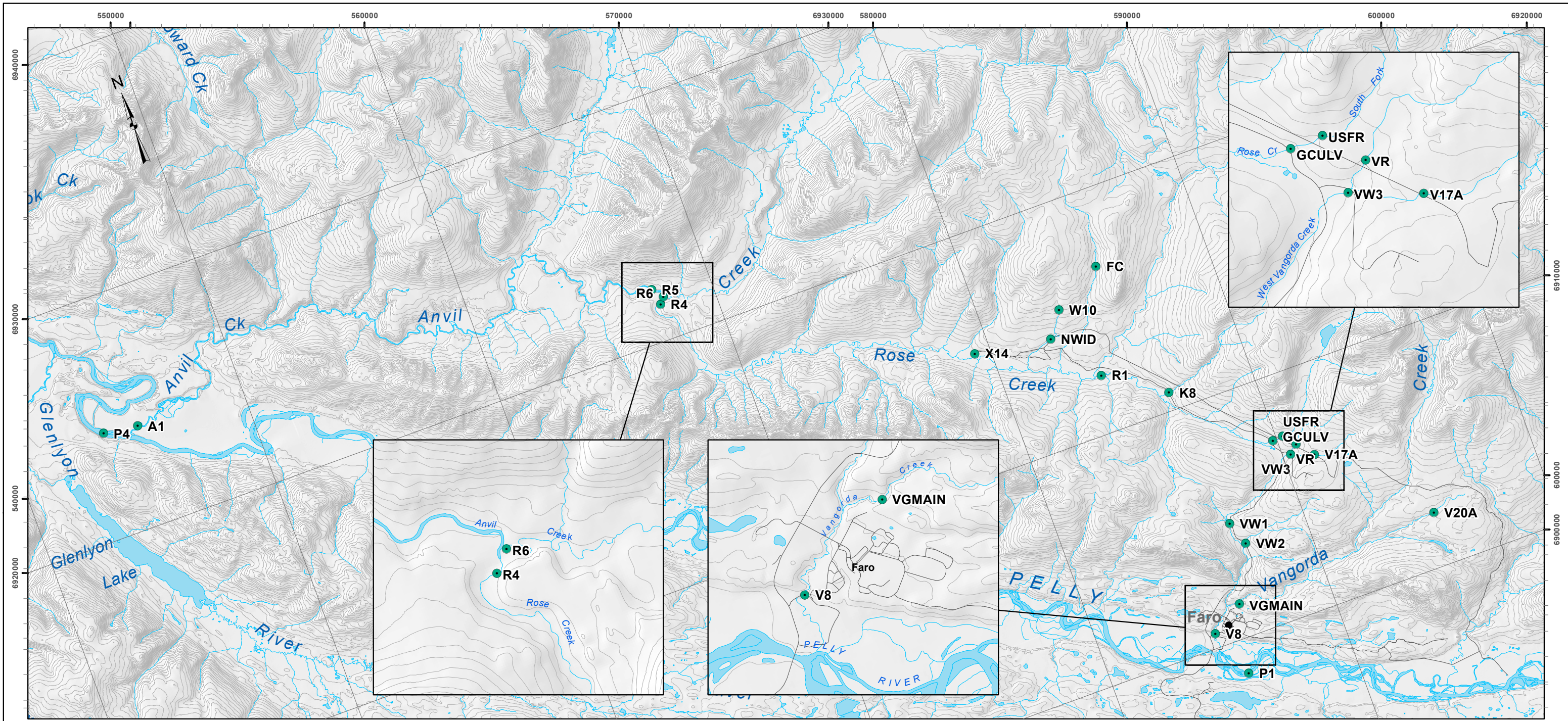
Water levels and turbidity levels had decreased from the previous sampling trip, which represented the spring sampling event. The three stations that were inaccessible during the high water in June 2013 were now accessible. All other sampling locations were consistent with the previous trip.



Table 1. Summary of 2013 Faro Pelly River Aquatics Program surface water quality station locations, August 2013.

Station Name	UTM Coordinates ⁽¹⁾		Location Description	Station Purpose
	Easting	Northing		
A1	545359	6924220	Anvil Creek near the confluence with Pelly River	Receiving
FC	585362	6916780	Faro Creek above diversion channel	Reference
GCULV	589818	6907388	South Fork Rose Creek d/s Haul Road and u/s Mine Access Road	Other
K8	586420	6910759	Reservoir Creek u/s Mine Access Road	Other
NWID	582536	6914552	Northwest interceptor ditch u/s of diversion point	Receiving
P1	585548	6898568	Pelly River u/s of Vangorda Creek ⁽²⁾	Reference
P4	543912	6924417	Pelly River d/s of Anvil Creek	Receiving
R1	584012	6912410	South Fork Rose Creek u/s pump house pond and tailings system	Reference
R4	567680	6921520	Rose Creek u/s confluence with Anvil Creek	Receiving
R5	567540	6922219	Anvil Creek u/s of Rose Creek after full mixing	Receiving
R6	567908	6921780	Anvil Creek u/s of Rose Creek	Receiving
USFR	590268	6907403	South Fork Rose Creek u/s Haul Road	Reference
V17A	591259	6906240	Creek from Grum ore transfer pad	Receiving
V20A	595137	6902240	Dixon Creek u/s of mine workings, tributary of Vangorda Creek	Reference
V8	584785	6900600	Lower Vangorda Creek at the footbridge	Receiving
VGMAIN	586163	6901427	Main Fork Vangorda Creek d/s of mine but u/s of West Vangorda Creek	Receiving
VR	590688	6906910	West Fork of Vangorda Creek u/s of Haul Road	Reference
VW1	586930	6904733	West Fork of Vangorda Creek d/s of landslide but u/s of VW2	Receiving
VW2	587281	6903723	Tributary to West Vangorda Creek which drains Grum west lobe	Receiving
VW3	590329	6906589	West Fork of Vangorda Creek d/s of AEX Creek	Receiving
W10	583280	6915590	Upper Guardhouse Creek u/s NW Dump	Reference
X14	579340	6915080	Rose Creek d/s of the diversion channel	Receiving

Notes: ⁽¹⁾ UTM coordinates in NAD 83 datum, Zone 8V. ⁽²⁾ Vangorda Creek is officially known as Van Gorder Creek, which is the geographic name; however, for the purposes of this report the name has been left as Vangorda, as that is the name used by AAM across the Faro Mine Complex.



Faro Pelly River Aquatics Program Surface Water Sampling Locations: August 2013

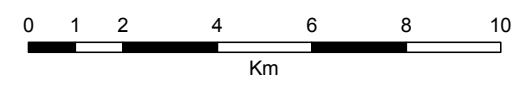
- Legend**
- Water Quality Monitoring Station
 - Robert Campbell Highway
 - Access Road

1:250,000 topographic spatial data: Canvec and National Topographic Database (NTDB); courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

Digital Elevation Model provided by Geomatics - Yukon Government via online source (Corporate Spatial Warehouse) www.geomatics.yukon.ca.

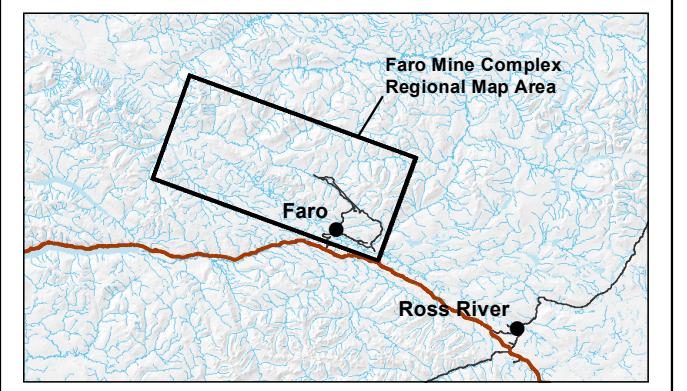
Project data displayed is site specific. Data collected by EDI Environmental Dynamics Inc. (2013) was obtained using Garmin GPS technology.

Van Gorder Creek will be referred to by its alternate name throughout this report, 'Vangorda Creek', as that is the name used by AAM for the Faro Mine Complex and Faro Mine Remediation Project, while Van Gorder Creek remains the official geographic name (Yukon Government Tourism and Culture 2010).



Map Scale = 1:160,000 (printed on 11 x 17)
Map Projection: North American Datum 1983 UTM Zone 8N

Drawn: MP	Checked: MM	Overview	Date: 13/09/2013
--------------	----------------	----------	------------------





2 METHODOLOGY

Two EDI field crew members conducted the summer surface water quality program from August 12-13, 2013 at the Faro Mine Complex and surrounding area. Several stations were accessed by helicopter, including P1, P4, A1, R4, R5, R6, and V20A. The remaining stations were accessed by vehicle with a relatively short walk on foot to the sampling location. The following sections outline details on field methodology, laboratory analysis, QA/QC program, and data analysis conducted under this program.

2.1 FIELD METHODOLOGY

Water samples were collected at each site for laboratory analysis, along with in situ field data, photo documentation, and geographic coordinate information. A YSI 556 multi-meter was used collect in situ field parameters, including water temperature, pH, and specific conductivity. Field crews calibrated the meter on a daily basis prior to field sampling. Field data was recorded on standard field datasheets including station name, sample identifier, sample date and time, water temperature, specific conductivity, pH, photo numbers and a record of site conditions including flow stage (low, regular, high), turbidity (clear, low, moderate, high), and any other observations.

Laboratory-cleaned bottles were filled using standard techniques (i.e. nitrile gloves, appropriate bottle handling) and samples were filtered and preserved on site, as directed by the lab. Samples were kept in coolers with ice packs during the field work and transport, and were stored in a refrigerator overnight. Chain of Custody forms were included in each sample cooler, and samples were delivered to ALS Laboratories upon arrival back in Whitehorse, YT to ensure lab holding times were met.

2.2 LABORATORY ANALYSIS

All surface water quality laboratory analysis was conducted by ALS. Parameters analyzed included routine, organics, nutrients, and metals. A complete list of parameters is included below in Table 2 with minimum and preferred method detection limits.

Analytical data generated by ALS was provided in an electronic data deliverable format specific to the project, as outlined in the Faro Pelly River Aquatics Program Agreement document (No. C00017770).



Table 2. List of parameters selected for laboratory analysis for the Faro Pelly River Aquatics Program (table continues to next page).

Parameters for Laboratory Analysis	Units	Minimum Detection Limit	Preferred Detection Limit
Miscellaneous Parameters			
Alkalinity	mg/L	1	1
Ammonia – N	mg/L	0.05	0.02
Chloride	mg/L	1	0.05
Dissolved solids, total (TDS)	mg/L	10	10
Nitrate – N	mg/L	0.1	0.03
Organic carbon, dissolved (DOC)	mg/L	1	0.1
Organic carbon, total (TOC)	mg/L	1	0.1
Phosphorus, total	mg/L	0.005	0.002
pH	pH Units	0.01	0.01
Sulphate	mg/L	1	0.2
Suspended solids, total (TSS)	mg/L	2	1
ICP – Metals Scan (Total and Dissolved)			
Aluminum (Al)	mg/L	0.005	0.001
Antimony (Sb)	mg/L	0.005	0.001
Arsenic (As)	mg/L	0.001	0.0005
Barium (Ba)	mg/L	0.01	0.001
Beryllium (Be)	mg/L	0.001	0.001
Bismuth (Bi)	mg/L	0.002	0.001
Boron (B)	mg/L	0.05	0.001
Cadmium (Cd)	mg/L	0.00001	0.000005
Calcium (Ca)	mg/L	0.5	0.05
Chromium (Cr)	mg/L	0.001	0.0002
Cobalt (Co)	mg/L	0.0009	0.00005
Copper (Cu)	mg/L	0.001	0.0001
Iron (Fe)	mg/L	0.05	0.005
Lead (Pb)	mg/L	0.001	0.0002
Magnesium (Mg)	mg/L	0.5	0.05
Manganese (Mn)	mg/L	0.002	0.0005
Molybdenum (Mo)	mg/L	0.001	0.001
Nickel (Ni)	mg/L	0.002	0.001
Potassium (K)	mg/L	0.5	0.05
Selenium (Se)	mg/L	0.001	0.0002
Silver (Ag)	mg/L	0.00005	0.00001
Sodium (Na)	mg/L	0.5	0.05
Strontium (Sr)	mg/L	0.002	0.001
Thallium (Tl)	mg/L	0.0003	0.00005
Tin (Sn)	mg/L	0.001	0.001



Parameters for Laboratory Analysis	Units	Minimum Detection Limit	Preferred Detection Limit
Titanium (Ti)	mg/L	0.005	0.005
Uranium (U)	mg/L	0.005	0.0001
Vanadium (V)	mg/L	0.006	0.001
Zinc (Zn)	mg/L	0.005	0.0005
Zirconium (Zr)	mg/L	0.004	0.001

2.3 QA/QC PROGRAM

Several QA/QC measures were employed during the summer 2013 sampling visit, including two duplicate samples, a field blank sample and a trip blank sample.

- Duplicate samples are essentially sample replicates collected at the same date, time and location as the regular sample. All sampling methodology is the same, as if it is a separate site. Duplicates were collected from two sites, randomly selected on the August 2013 trip. The duplicate samples were conducted to check the accuracy and precision of the laboratory analysis as well as identify environmental variability.
- The field blank sample was collected on site as well, where a set of sample bottles was filled with deionized water at some point during the sampling trip. Sampling methodology was the same as if sampling from a stream, with filtering and preserving as required. The purpose of a field blank is to identify any contamination introduced to the sample from the sampler or the supplies (e.g., filter, syringe, bottle, or preservative).
- The travel blank was a sample set provided by the laboratory to be carried by the staff to and from site during the field work. The travel blank was not opened at any time during the trip. The purpose of including a travel blank is to identify any contamination of the sample caused during transportation or storage.

Following receipt of the laboratory analysis results, a review of the QA/QC sample results was completed according to the *British Columbia Field Sampling Manual* (Clark 2003). Field and travel blank sample data was reviewed to ensure that concentrations of all potential contaminants were low to below detection limits. Duplicate samples were used to calculate relative percent difference (RPD) to express precision of a sample and its duplicate, see formula below:

$$\%RPD = \left(\frac{(x_1 - x_2)}{\frac{(x_1 + x_2)}{2}} \right) \times 100\%$$

Where duplicate results were less than 5-times the detection limit, the difference between the sample and the duplicate should be no greater than 2-times the detection limit to be considered precise. If the difference between the sample and duplicate are greater than 2-times the detection limit, the RPD value must be



reported. For analytical results greater than 5-times the detection limit, RPD values less than 20% are considered precise. RPD values greater than 50% indicate problems or errors that affect precision of the analytical result. See Table 3 for a summary of how QA/QC results are assessed.

Table 3. QA/QC assessment categories and results

Category	QA/QC Result
<DL	Adequately Precise
<2XDL	Adequately Precise
RPD<20%	Adequately Precise
RPD>20%	Imprecise or Intrinsically High Variability
RPD>50%	Error or Problem

Where, DL = detection limit and RPD = relative percent difference.

2.4 DATA ANALYSIS

For the purpose of this report, data were reviewed and parameters of concern were summarized and compared with the Canadian Council of Ministers of the Environment (CCME) guidelines for the protection of freshwater aquatic life (CCME AL; CCME 2013; Table 4), and with the Effluent Quality Standards (EQS) for the Faro Mine Complex (Table 5).

Table 4. List of applicable CCME guidelines for Aquatic Life (table continues to next page).

Water Quality Parameter	CCME AL Guideline	Comments
Aluminum	0.1 mg/L	CCME is 0.1 at pH > 6.5, if pH is lower than 6.5, guideline is set at 0.005 mg/L
Ammonia	0.75 mg/L	Guideline is temperature and pH dependent. This represents a highly conservative guideline calculated for a pH of 8.5 and a water temperature of 0°C. Guideline decreases with increasing pH and temperature.
Arsenic	0.005 mg/L	-
Cadmium	0.000033 mg/L	Guideline is hardness dependent; this value is for a hardness of 100 mg/L. A hardness dependent guideline was calculated based on the following equation: Hardness Adjusted Guideline = $10^{0.86(\log[\text{hardness}]-3.2)}/1000$
Chloride	120 mg/L	-
Chromium	0.0089 mg/L	-
Copper	0.002 mg/L	Guideline is hardness dependent; this value is for a hardness of 100 mg/L. A hardness dependent guideline was calculated based on the following equation:



Water Quality Parameter	CCME AL Guideline	Comments
Hardness Adjusted Guideline = $e^{0.8545 (\text{LN}[\text{hardness}]-1.465)}/1000$		
Fluoride	0.120 mg/L	-
Iron	0.3 mg/L	-
Lead	0.003 mg/L	Guideline is hardness dependent; this value is for a hardness of 100 mg/L. A hardness dependent guideline was calculated based on the following equation: Hardness Adjusted Guideline = $e^{1.273 (\text{LN}[\text{hardness}]-4.705)}/1000$
Molybdenum	0.0073 mg/L	-
Nickel	0.1 mg/L	Guideline is hardness dependent; this value is for a hardness of 100 mg/L. A hardness dependent guideline was calculated based on the following equation: Hardness Adjusted Guideline = $e^{0.76 (\text{LN}[\text{hardness}]+1.06)}/1000$
Nitrate	13 mg/L	-
Nitrite	0.06 mg/L	-
pH	6.5 - 9.0	-
Selenium	0.001 mg/L	-
Silver	0.0001 mg/L	-
Thallium	0.0008 mg/L	-
Uranium	0.015 mg/L	-
Zinc	0.03 mg/L	-

Where, '-' indicates no comment on this specific parameter.



Table 5. Applicable Faro EQS for the Faro Mine Complex.

Water Quality Parameter	Effluent Quality Standard
Total Suspended Solids	≤ 15 mg/L
pH	≥ 6.5 pH units
Ammonia (as N)	≤ 1.4 mg/L
Antimony	≤ 0.1 mg/L
Arsenic	≤ 0.05 mg/L
Barium	≤ 1 mg/L
Cadmium	≤ 0.02 mg/L
Copper	≤ 0.2 mg/L
Lead	≤ 0.2 mg/L
Molybdenum	≤ 0.5 mg/L
Nickel	≤ 0.5 mg/L
Selenium	≤ 0.05 mg/L
Silver	≤ 0.1 mg/L
Zinc	≤ 0.5 mg/L



3 RESULTS

3.1 FIELD AND LAB ANALYSIS RESULTS

Observed water levels were low to moderate during the August 12 to 13, 2013 sampling event with clear to low turbidity levels at most stations. Water temperatures ranged from 4.0°C to 18.7°C (Table 7). Specific conductivity ranged from 36 $\mu\text{S}/\text{cm}$ to 2,346 $\mu\text{S}/\text{cm}$ and pH ranged from pH 6.34 to pH 8.26. Field datasheets are provided in Appendix B.

Samples were delivered to ALS on August 14, 2013. Laboratory analysis results for the surface water samples were compared to both CCME Aquatic Life Guidelines (CCME 2013) and the Faro Effluent Quality Standards. The total suspended solids EQS was exceeded at three stations (VW1, A1, and NWID). The zinc (Zn) standards for CCME and EQS were both exceeded at the NWID station. Several other stations had exceedances of several CCME guidelines, including fluoride (F), aluminum (Al), cadmium (Cd), copper (Cu), iron (Fe), lead (Pb), selenium (Se), and zinc (Zn). Several of these parameters are hardness dependent (e.g. Cd, Cu, Pb) and guideline values for these parameters were adjusted based on hardness levels. A summary of stations with guideline and/or standard exceedances is provided in Table 6. All lab analysis results are detailed in Appendix C with exceedances highlighted with the Lab Certificate of Analysis provided in Appendix D.

Compared to the June 2013 results, many metal concentrations have decreased to below guidelines values. Seven stations had no chemical exceedances, including the GCULV, R1, R4, R5, R6, USFR, and V17A stations. The number of stations with exceedances in Al, Cd, Cr, Cu, Fe, Pb, and Zn has decreased from June to August 2013. Conversely, the number of stations with exceedances in F has increased, with not one station now (VW2) but six stations with F exceedances (P1, V20A, P4, V8, VW1, and VW2). Selenium concentrations at P1 and VW2 exceeded the CCME guideline in August, whereas in June it was the NWID and VW2 stations that had Se exceedances.

Both Pelly River stations (P1, P4) had exceedances for F and Cd, in addition to Se at P1 (P1 being the reference site). The NWID station continued to have the highest number of chemical exceedances of any station, often with concentrations much higher than the guideline and/or standard. Several of the reference stations had exceedances likely attributed to the mineralization in the local area (e.g. FC, P1, V20A, VR, and W10 stations). Exceedances at several of the receiving environment stations may be attributed to naturally high levels of mineralization in combination with historical mining and/or ongoing care and maintenance activities associated with the Faro Mine Complex.



Table 6. Summary of CCME Guideline or Faro EQS parameter exceedances, August 2013.

Type	Station ID	Guideline/Standard Exceedances									
		TSS	F	Al	Cd	Cr	Cu	Fe	Pb	Se	Zn
Reference Stations	USFR	-	-	-	-	-	-	-	-	-	-
	FC	-	-	X	X	-	X	-	X	-	-
	W10	-	-	-	X	-	X	-	-	-	-
	P1	-	X	-	X	-	-	-	-	X	-
	V20A	-	X	-	-	-	-	-	-	-	-
	R1	-	-	-	-	-	-	-	-	-	-
	VR	-	-	-	X	-	-	-	-	-	-
Receiving Environment Stations	A1	*	-	X	X	-	X	X	-	-	-
	R4	-	-	-	-	-	-	-	-	-	-
	R5	-	-	-	-	-	-	-	-	-	-
	R6	-	-	-	-	-	-	-	-	-	-
	V17A	-	-	-	-	-	-	-	-	-	-
	P4	-	X	-	X	-	-	-	-	-	-
	V8	-	X	X	X	-	-	X	-	-	-
	VGMAIN	-	-	-	X	-	-	-	-	-	X
	X14	-	-	-	-	-	-	X	-	-	-
	NWID	*	-	X	X	-	X	X	X	-	X*
	VW1	*	X	X	-	-	-	X	-	-	-
	VW2	-	X	-	X	-	-	-	-	X	-
VW3	-	-	-	X	-	-	-	-	-	-	
Other	GCULV	-	-	-	-	-	-	-	-	-	-
	K8	-	-	-	X	-	-	-	-	-	-

Where, '-' indicates no exceedance, 'X' indicates an exceedance of CCME guidelines, * indicates an exceedance of the Faro EQS.



Faro Pelly River Aquatics Program: August 12-13, 2013 Field Report

Table 7. Summary of in situ water quality parameter, August 2013.

Type	Site	Sample Date (yy-mmm-dd)	Time (hh:mm)	Water Temp (°C)	SPC (µS/cm)	pH	Site Conditions
Reference Stations	P1	13-Aug-12	19:30	18.7	322.0	7.00	Water level low, turbidity low
	FC	13-Aug-13	10:30	8.07	36.0	6.34	Water level moderate, clear water
	USFR	13-Aug-13	09:56	11.5	57.0	7.12	Water level moderate, clear water
	VR	13-Aug-13	09:38	5.6	63.0	6.63	Water level moderate, clear water
	V20A	13-Aug-12	19:08	11.5	375.0	7.62	Water level low, turbidity low
	R1	13-Aug-13	12:30	10.9	190.0	7.91	Water level moderate, clear water
	W10	13-Aug-13	11:35	6.57	115.0	7.50	Water level moderate, clear water
Receiving Environment Stations	A1	13-Aug-12	16:00	14.5	255.0	7.84	Water levels low to moderate, turbidity high
	R4	13-Aug-12	17:00	12.9	277.0	8.19	Water level low, clear water
	R5	13-Aug-12	16:36	12.0	266.0	8.26	Water levels low, clear water
	R6	13-Aug-12	17:00	11.2	259.0	8.15	Water levels low, clear water
	P4	13-Aug-12	15:40	18.6	326.0	7.60	Water levels low, water clear to low turbidity
	V17A	13-Aug-13	09:22	7.2	166.0	7.01	Water level moderate, clear water
	NWID	13-Aug-13	12:55	10.4	2,346.0	7.26	Water level moderate, low to moderate turbidity
	V8	13-Aug-13	16:20	11.4	856.0	8.23	Water level moderate, moderate turbidity
	VGMAIN	13-Aug-13	16:57	12.0	1,005.0	8.12	Water level low to moderate, clear water
	X14	13-Aug-13	12:00	11.0	325.0	7.71	Water level moderate, low turbidity
	VW1	13-Aug-13	15:40	10.2	317.0	7.99	Water level low to moderate, moderate turbidity
	VW2	13-Aug-13	16:04	4.0	638.0	8.17	Water levels high, clear water
VW3	13-Aug-13	15:20	9.5	153.0	7.50	Water level moderate, clear water	
Other	GCULV	13-Aug-13	15:06	14.4	60.0	7.11	Water level moderate, clear water
	K8	13-Aug-13	13:20	8.7	126.0	7.73	Water level moderate, clear water



3.2 QA/QC RESULTS

Duplicate samples were collected at stations R6 and FC. Results were analyzed as outlined in Section 2.4, according to the *British Columbia Field Sampling Manual* (Clark 2003). A table of the results is provided in Appendix D.

Results are either categorized as less than detection limit (<DL), less than twice the detection limit (<2XDL) or relative percent difference (RPD). Overall average RPD for each set of duplicate QA/QC samples was 3.0% for the R6 sample and duplicate and 5.3% for the FC sample and duplicate. The R6 sample set was considered adequately precise. The FC set was adequately precise for all parameters, except Al-Total (-25.8%), Fe (-26.3%) and Pb (-61.6%). The values greater than 20% suggest that the data is imprecise or that there is intrinsically high variability, while the value over 50% suggests an error or problem.

Travel blank and field blank results were all within acceptable levels. There were no indications of contamination (Appendix D).



4 RECOMMENDATIONS

Sampling was conducted successfully during the Faro Pelly River Aquatics Program summer 2013 sampling event. For the fall program, sampling should continue as outlined in this report for consistency.

This page is intentionally blank.



5 REFERENCES

- Canadian Council Ministers of the Environment (CCME). Canadian Environmental Quality Guidelines Summary Table. <http://st-ts.ccme.ca/>, accessed June 2013.
- Clark, M.J.R. (editor). 2003. British Columbia Field Sampling Manual. Water, Air and Climate Change Branch, Ministry of Water, Land and Air Protection, Victoria, BC, Canada. 312 pp. Accessed at http://www.env.gov.bc.ca/epd/wamr/labsys/field_man_pdfs/fld_man_03.pdf
- Yukon Government Tourism and Culture. 2010. Gazetteer of Yukon. Geographic Names Program, Heritage Resources Unit, Cultural Services Branch, May 2010. 74 pp.

5.1 SPATIAL DATA

- 1:250,000 CanVec topographic data from Government of Canada, Natural Resources Canada, Earth Sciences Sector, Centre for Topographic Information. Geogratis website <http://geogratis.cgdi.gc.ca>
- Yukon Government – Geomatics. Digital Elevation Model. Corporate Spatial Warehouse. Accessed from www.geomaticsyukon.ca

Disclaimer:

Maps presented in this document are a geographical representation of known features. Although the data collected and presented herein has been obtained with the utmost attention to quality, this document is not an official land survey and should not be considered for spatial calculation. EDI Environmental Dynamics Inc. does not accept any liability for errors, omissions or inaccuracies in the data.

This page is intentionally blank.



**APPENDIX A SITE PHOTOGRAPHS,
AUGUST 12-13, 2013**

This page is intentionally blank.



Vangorda Creek Watershed Stations



Photo 1. West Fork Vangorda Creek upstream of Haul Road (**VR**), looking downstream to Haul Road culvert.



Photo 2. Vangorda Creek tributary from Grum ore transfer pad (**V17A**), looking upstream from Haul Road culvert.



Photo 3. West Fork Vangorda Creek upstream of VW2 Tributary (**VW1**), looking upstream.



Photo 4. West Fork Vangorda Creek tributary which drains Grum west lobe (**VW2**), looking upstream from Mine Access Road culvert.



Vangorda Creek Watershed Stations (continued)



Photo 5. West Fork Vangorda Creek downstream of AEX Creek (**VW3**), looking upstream to auxiliary road culvert.



Photo 6. Main Fork Vangorda Creek downstream of mine but upstream of West Vangorda Creek confluence (**VGMAIN**), looking upstream from footbridge.



Photo 7. Lower Vangorda Creek downstream of confluence of West Vangorda Creek and Main Fork Vangorda Creek (**V8**), looking upstream from bridge.



Photo 8. Dixon Creek upstream of mine, tributary of Vangorda Creek (**V20A**), looking across to ponded area and outlet stream flowing to the left.



Rose Creek Watershed Stations



Photo 9. South Fork of Rose Creek upstream of pumphouse pond and tailings system (**R1**), looking downstream from sampling location.



Photo 10. Rose Creek upstream of confluence with Anvil Creek (**R4**), looking upstream (sampling location on left side of photo).



Photo 11. South Fork Rose Creek upstream of Haul Road (**USFR**), looking upstream from sampling location.



Photo 12. South Fork Rose Creek downstream of Haul Road but upstream of Mine Access Road (**GCULV**), looking upstream from culvert.



Rose Creek Watershed Stations, including Faro Creek,
Guardhouse Creek and the Northwest Interceptor Ditch.



Photo 13. Rose Creek downstream of diversion channel (**X14**), looking downstream from sampling location.



Photo 14. Faro Creek above diversion channel (**FC**), looking downstream from sampling location.



Photo 15. Upper Guardhouse Creek upstream of NW Dump (**W10**), looking downstream from sampling location.



Photo 16. Northwest interceptor ditch upstream of diversion point (**NWID**), looking at sampling location.



Anvil Creek Stations & Reservoir Creek Station



Photo 17. Anvil Creek upstream from confluence with Pelly River (**A1**), view from helicopter looking at sampling location on gravel bar.



Photo 18. Sampled Anvil Creek downstream of confluence with Rose Creek (**R5**). View from helicopter looking upstream at gravel bar sampling location.



Photo 19. Anvil Creek upstream of confluence with Rose Creek (**R6**), view looking downstream from sampling location towards mouth of Rose Creek.



Photo 20. Reservoir Creek upstream of Mine Access Road (**K8**), view looking upstream of culvert from sampling location.



Pelly River Stations



Photo 21. Looking downstream from **P1** sampling location on Pelly River upstream of the Vangorda Creek confluence.



Photo 22. View of the gravel bar sampling location (**P4**) on the Pelly River downstream of the Anvil Creek confluence (view looking upstream).



**APPENDIX B EDI FIELD DATA SHEETS,
AUGUST 12-13, 2013**

This page is intentionally blank.



Project No.: 13-Y-0199

Weather: light wind
mostly sunny
+28°C

Field Samplers: MM, B.S.M.

Project Name: Faro Surface Water Quality

Page 1 of 10

YSI Calibration Performed? Yes No

Date / Time: 14:30 Aug 12

Site Information		Site Information	
Site Name:	<u>RH Anvil Rose Crk</u>	Site Name:	<u>P4 Pelly ds Anvil</u>
Sample Identifier:		Sample Identifier:	<u>n/a</u>
Sample Date and Time:	<u>Aug 12/13 17:00</u>	Sample Date and Time:	<u>12 Aug / 13 15:40</u>
Replicate ID (if applicable)		Replicate ID (if applicable)	<u>n/a</u>
Field Measured Parameters		Field Measured Parameters	
Temperature:	<u>12.95</u>	Temperature:	<u>18.6</u>
Specific Conductivity (SPC):	<u>277</u>	Specific Conductivity (SPC):	<u>326</u>
pH:	<u>8.19</u>	pH:	<u>7.60</u>
Turbidity:		Turbidity:	
Site Conditions		Site Conditions	
flow level:	<u>low</u>	flow level:	
turbidity (clear, light, mod, high):	<u>clear</u>	turbidity (clear, light, mod, high):	<u>clear - low</u>
ice thickness (if applicable)		ice thickness (if applicable)	<u>n/a</u>
Notes		Notes	
(if pit incl. DO and ice thickness)		(if pit incl. DO and ice thickness)	
Photo Numbers		Photo Numbers	
Datasheet:	<u>464</u>	Datasheet:	
Downstream:	<u>466</u>	Downstream:	
Upstream:	<u>465, 467</u>	Upstream:	
Overview:		Overview:	

Site Information		Site Information	
Site Name:	<u>A-1 Anvil creek</u>	Site Name:	<u>R5 Anvil creek dr RC</u>
Sample Identifier:		Sample Identifier:	
Sample Date and Time:	<u>Aug 12/13 16:00</u>	Sample Date and Time:	<u>Aug 12/13 16:36</u>
Replicate ID (if applicable)		Replicate ID (if applicable)	
Field Measured Parameters		Field Measured Parameters	
Temperature:	<u>14.47</u>	Temperature:	<u>11.99</u>
Specific Conductivity (SPC):	<u>255</u>	Specific Conductivity (SPC):	<u>266</u>
pH:	<u>7.84</u>	pH:	<u>8.26</u>
Turbidity:		Turbidity:	
Site Conditions		Site Conditions	
flow level:	<u>low - mod</u>	flow level:	<u>low</u>
turbidity (clear, light, mod, high):	<u>high</u>	turbidity (clear, light, mod, high):	<u>clear</u>
ice thickness (if applicable)	<u>n/a</u>	ice thickness (if applicable)	
Notes		Notes	
(if pit incl. DO and ice thickness)		(if pit incl. DO and ice thickness)	
Photo Numbers		Photo Numbers	
Datasheet:	<u>439</u>	Datasheet:	<u>459</u>
Downstream:	<u>441</u>	Downstream:	<u>458</u>
Upstream:	<u>440</u>	Upstream:	<u>457</u>
Overview:	<u>442</u>	Overview:	

Field Blank ID _____

Trip Blank ID _____



Field Samplers: MM, B Sm.

Weather: 12°C light breeze mostly sunny

Form ID: 13-Y-0167
Name: Mount Nansen Water Quality
Page 2 of 6
Printed? Yes No

Date / Time: 14:30 Aug 12, 2013

Site Information		Site Information	
Name:	<u>R10 Anvil ulr Rose Ck</u>	Site Name:	<u>V20a</u>
Identifier:		Sample Identifier:	<u>12A0570</u>
Sample Date and Time:	<u>Aug 12/13 17:00</u>	Sample Date and Time:	<u>19:08</u>
Replicate ID (if applicable):	<u>Duplicate #1</u>	Replicate ID (if applicable):	
Field Measured Parameters		Field Measured Parameters	
Temperature:	<u>11.18</u>	Temperature:	<u>11.48°C</u>
Specific Conductivity (SPC):	<u>259</u>	Specific Conductivity (SPC):	<u>325</u>
pH:	<u>8.15</u>	pH:	<u>7.62</u>
Turbidity:		Turbidity:	<u>N/A</u>
Site Conditions		Site Conditions	
flow level:	<u>low</u>	flow level:	<u>low</u>
turbidity (clear, light, mod, high):	<u>clear</u>	turbidity (clear, light, mod, high):	<u>clear</u>
ice thickness (if applicable):		ice thickness (if applicable):	<u>N/A</u>
(if pit incl. DO and ice thickness)		(if pit incl. DO and ice thickness)	
Notes:		Notes:	<u>no flow at regular sam site</u>
Photo Numbers:		Photo Numbers:	
Downstream:		Downstream:	
Overview:		Overview:	

Site Information		Site Information	
Name:	<u>P1 Pelly River ulr</u>	Site Name:	<u>V60a</u>
Sample Identifier:		Sample Identifier:	
Sample Date and Time:	<u>Aug 12, 2013</u>	Sample Date and Time:	
Replicate ID (if applicable):		Replicate ID (if applicable):	
Field Measured Parameters		Field Measured Parameters	
Temperature:	<u>18.68</u>	Temperature:	
Specific Conductivity (SPC):	<u>322</u>	Specific Conductivity (SPC):	
pH:	<u>8.30</u>	pH:	
Turbidity:		Turbidity:	
Site Conditions		Site Conditions	
flow level:		flow level:	
turbidity (clear, light, mod, high):		turbidity (clear, light, mod, high):	
ice thickness (if applicable):		ice thickness (if applicable):	
(if pit incl. DO and ice thickness)		(if pit incl. DO and ice thickness)	
Notes:	<u>Main channel gravel</u>	Notes:	
Photo Numbers:		Photo Numbers:	
Downstream:		Downstream:	
Overview:		Overview:	
Datasheet:		Datasheet:	
Upstream:		Upstream:	

Field Blank ID _____



Project No.: 13-Y-0199

Weather: clear skies,
light wind,
150C

Field Samplers: MM,
BSM

Project Name: Faro Surface Water Quality

Page 3 of 6

YSI Calibration Performed? Yes No

Date / Time: 13 Aug 2013, 8:00

Site Information		Site Information	
Site Name:	V17a	Site Name:	VR
Sample Identifier:	V170	Sample Identifier:	VR
Sample Date and Time:	13 Aug 2013, 9:22	Sample Date and Time:	13 Aug 2013, 9:38
Replicate ID (if applicable)		Replicate ID (if applicable)	
Field Measured Parameters		Field Measured Parameters	
Temperature:	7.25	Temperature:	5.57
Specific Conductivity (SPC):	166	Specific Conductivity (SPC):	63
pH:	7.01	pH:	6.63
Turbidity:	N/A	Turbidity:	
Site Conditions		Site Conditions	
flow level:	moderate	flow level:	moderate
turbidity (clear, light, mod, high):	clear	turbidity (clear, light, mod, high):	clear
ice thickness (if applicable)	N/A	ice thickness (if applicable)	n/a
Notes		Notes	
(if pit incl. DO and ice thickness)		(if pit incl. DO and ice thickness)	
Photo Numbers		Photo Numbers	
Datasheet:	0488	Datasheet:	0493
Downstream:	0487	Downstream:	0491
Upstream:	0486	Upstream:	0490
Overview:	0489	Overview:	0492

Site Information		Site Information	
Site Name:	USFR	Site Name:	FC
Sample Identifier:	USFR	Sample Identifier:	FC
Sample Date and Time:	Aug 13, 2013 9:56	Sample Date and Time:	13 Aug 2013 10:20
Replicate ID (if applicable)		Replicate ID (if applicable)	Duplicate #2
Field Measured Parameters		Field Measured Parameters	
Temperature:	11.46	Temperature:	8.02
Specific Conductivity (SPC):	57	Specific Conductivity (SPC):	36
pH:	7.12	pH:	6.34
Turbidity:		Turbidity:	
Site Conditions		Site Conditions	
flow level:	moderate	flow level:	moderate
turbidity (clear, light, mod, high):	clear	turbidity (clear, light, mod, high):	clear
ice thickness (if applicable)	n/a	ice thickness (if applicable)	
Notes		Notes	
(if pit incl. DO and ice thickness)		(if pit incl. DO and ice thickness)	
Photo Numbers		Photo Numbers	
Datasheet:	0497	Datasheet:	501
Downstream:	0495	Downstream:	499
Upstream:	0493	Upstream:	498
Overview:	0498	Overview:	500

Field Blank ID _____
Trip Blank ID _____



Project No.: 13-Y-0167

Weather: 28°C sunny
light breeze

Field Samplers: MM, PSm

Project Name: Mount Nansen Water Quality

Page 4 of 10

YSI Calibration Performed? Yes / No

Date / Time: 8AM Aug 13, 2013

Site Information		Site Information	
Site Name:	<u>W10</u>	Site Name:	<u>X14</u>
Sample Identifier:		Sample Identifier:	
Sample Date and Time:	<u>13 AUG 2013 11:35</u>	Sample Date and Time:	<u>Aug 13, 2013 12:00</u>
Replicate ID (if applicable)		Replicate ID (if applicable)	
Field Measured Parameters		Field Measured Parameters	
Temperature:	<u>6.57</u>	Temperature:	<u>10.98</u>
Specific Conductivity (SPC):	<u>115</u>	Specific Conductivity (SPC):	<u>325</u>
pH:	<u>7.50</u>	pH:	<u>7.71</u>
Turbidity:	<u>N/A</u>	Turbidity:	<u>N/A</u>
Site Conditions		Site Conditions	
flow level:	<u>moderate</u>	flow level:	<u>moderate</u>
turbidity (clear, light, mod, high):	<u>clear</u>	turbidity (clear, light, mod, high):	<u>light</u>
ice thickness (if applicable)	<u>N/A</u>	ice thickness (if applicable)	<u>N/A</u>
Notes		Notes	
(if pit incl. DO and ice thickness)		(if pit incl. DO and ice thickness)	
Photo Numbers		Photo Numbers	
Datasheet:	<u>505</u>	Datasheet:	<u>508</u>
Downstream:	<u>503</u>	Downstream:	<u>507</u>
Upstream:	<u>502</u>	Upstream:	<u>506</u>
Overview:	<u>504</u>	Overview:	<u>509</u>

Site Information		Site Information	
Site Name:	<u>Z1</u>	Site Name:	<u>NW1D</u>
Sample Identifier:		Sample Identifier:	
Sample Date and Time:	<u>13 AUG 2013 12:30</u>	Sample Date and Time:	<u>13 Aug 2013 12:55</u>
Replicate ID (if applicable)	<u>N/A</u>	Replicate ID (if applicable)	<u>N/A</u>
Field Measured Parameters		Field Measured Parameters	
Temperature:	<u>10.9°C</u>	Temperature:	<u>10.45</u>
Specific Conductivity (SPC):	<u>190</u>	Specific Conductivity (SPC):	<u>2346</u>
pH:	<u>7.91</u>	pH:	<u>7.26</u>
Turbidity:	<u>N/A</u>	Turbidity:	<u>N/A</u>
Site Conditions		Site Conditions	
flow level:	<u>moderate</u>	flow level:	<u>moderate</u>
turbidity (clear, light, mod, high):	<u>clear</u>	turbidity (clear, light, mod, high):	<u>light - moderate</u>
ice thickness (if applicable)	<u>N/A</u>	ice thickness (if applicable)	<u>N/A</u>
Notes		Notes	
(if pit incl. DO and ice thickness)		(if pit incl. DO and ice thickness)	
Photo Numbers		Photo Numbers	
Datasheet:	<u>512</u>	Datasheet:	<u>524</u>
Downstream:	<u>511</u>	Downstream:	<u>504</u>
Upstream:	<u>510</u>	Upstream:	<u>523</u>
Overview:	<u>513</u>	Overview:	<u>525</u>

Field Blank ID _____
Trip Blank ID _____



Project No.: 13-Y-0199

Weather: clear skies,
30°C

Field Samplers: MM,
B5m

Project Name: Faro Surface Water Quality

Page 5 of 6

YSI Calibration Performed? Yes / No

Date / Time: 9 AM AUG 13, 2013

Site Information		Site Information	
Site Name:	<u>K8</u>	Site Name:	<u>BCULV</u>
Sample Identifier:		Sample Identifier:	
Sample Date and Time:	<u>13 AUG 2013 13:20</u>	Sample Date and Time:	<u>13 AUG 2013 15:06</u>
Replicate ID (if applicable)		Replicate ID (if applicable)	
Field Measured Parameters		Field Measured Parameters	
Temperature:	<u>8.73°C</u>	Temperature:	<u>14.42°C</u>
Specific Conductivity (SPC):	<u>126</u>	Specific Conductivity (SPC):	<u>60</u>
pH:	<u>7.73</u>	pH:	<u>7.11</u>
Turbidity:	<u>N/A</u>	Turbidity:	<u>N/A</u>
Site Conditions		Site Conditions	
flow level:	<u>moderate</u>	flow level:	<u>moderate</u>
turbidity (clear, light, mod, high):	<u>clear</u>	turbidity (clear, light, mod, high):	<u>clear</u>
ice thickness (if applicable)	<u>N/A</u>	ice thickness (if applicable)	<u>N/A</u>
Notes		Notes	
(if pit incl. DO and ice thickness)		(if pit incl. DO and ice thickness)	
Photo Numbers		Photo Numbers	
Datasheet:	<u>529</u>	Datasheet:	<u>530</u>
Downstream:	<u>529</u>	Downstream:	<u>532</u>
Upstream:	<u>527</u>	Upstream:	<u>531</u>
Overview:	<u>530</u>	Overview:	<u>534</u>

Site Information		Site Information	
Site Name:	<u>VW3</u>	Site Name:	<u>VW1</u>
Sample Identifier:		Sample Identifier:	
Sample Date and Time:	<u>Aug 13, 2013 15:20</u>	Sample Date and Time:	<u>13 AUG 2013 15:40</u>
Replicate ID (if applicable)		Replicate ID (if applicable)	
Field Measured Parameters		Field Measured Parameters	
Temperature:	<u>9.48</u>	Temperature:	<u>10.20°C</u>
Specific Conductivity (SPC):	<u>153</u>	Specific Conductivity (SPC):	<u>317</u>
pH:	<u>7.50</u>	pH:	<u>7.99</u>
Turbidity:	<u>N/A</u>	Turbidity:	<u>N/A</u>
Site Conditions		Site Conditions	
flow level:	<u>moderate</u>	flow level:	<u>low - moderate</u>
turbidity (clear, light, mod, high):	<u>clear</u>	turbidity (clear, light, mod, high):	<u>moderate</u>
ice thickness (if applicable)	<u>n/a</u>	ice thickness (if applicable)	<u>N/A</u>
Notes		Notes	
(if pit incl. DO and ice thickness)		(if pit incl. DO and ice thickness)	
Photo Numbers		Photo Numbers	
Datasheet:	<u>533</u>	Datasheet:	<u>0542</u>
Downstream:	<u>534</u>	Downstream:	<u>0541</u>
Upstream:	<u>535</u>	Upstream:	<u>0543</u>
Overview:	<u>536</u>	Overview:	<u>0544</u>

Field Blank ID _____

Trip Blank ID _____



Project No.: 13-Y-0167

Weather: 30°C Sunny
calm

Field Samplers: MM, BSm

Project Name: Mount Nansen Water Quality

Page 6 of 6

YSI Calibration Performed? Yes / No

Date / Time: 3 AM Aug 13, 2013

Site Information		Site Information	
Site Name:	VW2	Site Name:	V8
Sample Identifier:		Sample Identifier:	
Sample Date and Time:	Aug 13, 2013 16:04	Sample Date and Time:	Aug 13, 2013 16:20
Replicate ID (if applicable)		Replicate ID (if applicable)	
Field Measured Parameters		Field Measured Parameters	
Temperature:	4.03	Temperature:	11.41
Specific Conductivity (SPC):	638	Specific Conductivity (SPC):	856
pH:	8.17	pH:	8.23
Turbidity:	n/a	Turbidity:	n/a
Site Conditions		Site Conditions	
flow level:	high	flow level:	moderate
turbidity (clear, light, mod, high):	clear	turbidity (clear, light, mod, high):	moderate
ice thickness (if applicable)	N/A	ice thickness (if applicable)	N/A
Notes		Notes	
(if pit incl. DO and ice thickness)		(if pit incl. DO and ice thickness)	From uls of bridge
Photo Numbers		Photo Numbers	
Datasheet:	552	Datasheet:	557
Downstream:	549	Downstream:	556
Upstream:	548	Upstream:	555
Overview:	551-551	Overview:	554

Site Information		Site Information	
Site Name:	VGMAIN	Site Name:	
Sample Identifier:		Sample Identifier:	
Sample Date and Time:	13 AUG 2013 16:57	Sample Date and Time:	
Replicate ID (if applicable)		Replicate ID (if applicable)	
Field Measured Parameters		Field Measured Parameters	
Temperature:	12.00	Temperature:	
Specific Conductivity (SPC):	1005	Specific Conductivity (SPC):	
pH:	8.12	pH:	
Turbidity:	N/A	Turbidity:	
Site Conditions		Site Conditions	
flow level:	low - moderate	flow level:	
turbidity (clear, light, mod, high):	near	turbidity (clear, light, mod, high):	
ice thickness (if applicable)	N/A	ice thickness (if applicable)	
Notes		Notes	
(if pit incl. DO and ice thickness)		(if pit incl. DO and ice thickness)	
Photo Numbers		Photo Numbers	
Datasheet:	561	Datasheet:	
Downstream:	558	Downstream:	
Upstream:	559	Upstream:	
Overview:	560	Overview:	

Field Blank ID 1630 Aug 13, 2013
Trip Blank ID _____



**APPENDIX C LABORATORY ANALYSIS
SUMMARY TABLE,
AUGUST 12-13, 2013**

This page is intentionally blank.



Table C-1. Water Quality Parameter Guideline Exceedances; August 12-13, 2013.

Analyte	Units	CCME-WATER-FAL	Faro Effluent Quality Standards	Station ID	FC	DUPLICATE #2 -FC	K8	V8	VW1	VW2	VW3	VGMAIN	VR	V17A	V20A
				Date Sampled Time	13-AUG-13 10:30	13-AUG-13 10:30	13-AUG-13 13:20	13-AUG-13 16:20	13-AUG-13 15:40	13-AUG-13 16:04	13-AUG-13 15:20	13-AUG-13 16:57	13-AUG-13 09:38	13-AUG-13 09:22	12-AUG-13 19:08
				Detection Limit	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Temperature (in-situ)	°C	-	-	-	8.1	-	8.7	11.4	10.2	4.0	9.5	12.0	5.6	7.2	11.5
Specific Conductivity (in-situ)	µS/cm	-	-	-	36.0	-	126.0	856.0	317.0	638.0	153.0	1005.0	63.0	166.0	375.0
pH (in-situ)	-	6.5 - 9.0	6.5	-	6.34	-	7.73	8.23	7.99	8.17	7.50	8.12	6.63	7.01	7.62
Hardness (as CaCO3)	mg/L	-	-	0.5	15.4	15.2	64.1	472	174	394	72.2	606	28.8	80.5	222
pH (lab)	pH	6.5 - 9.0	6.5	0.1	7.55	7.51	8.01	8.31	8.28	8.38	7.87	8.23	7.49	7.74	7.84
Total Suspended Solids	mg/L	-	15	1.0	<1.0	2.9	<2.0	6.4	39.6	4.4	<1.0	<1.0	<1.0	<1.0	<1.0
Total Dissolved Solids	mg/L	-	-	3.0	37.8	41	86.3	699	202	446	107	854	53	117	236
Alkalinity, Total (as CaCO3)	mg/L	-	-	2.0	17.3	17.4	55.5	128	127	285	50.9	98.1	27.6	45.6	223
Ammonia, Total (as N)	mg/L	0.75	1.3	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.01	<0.0050
Chloride (Cl)	mg/L	120	-	0.5	<0.50	<0.50	<0.50	<0.50	0.88	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride (F)	mg/L	0.12	-	0.02	0.082	0.083	0.101	0.21	0.176	0.17	0.082	<0.20	0.07	0.079	0.164
Nitrate (as N)	mg/L	3.0	-	0.005	<0.0050	<0.0050	0.0351	0.14	0.0137	0.116	0.0431	0.191	<0.0050	0.0928	0.0052
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010	<0.0010	<0.0010	<0.010	0.0017	<0.0010	<0.0010	<0.010	<0.0010	0.0016	<0.0010
Phosphorous (P), Total	mg/L	-	-	0.002	0.0036	0.0058	<0.0020	0.0077	0.0312	0.0251	0.0034	<0.0020	0.0026	0.0038	0.0021
Sulfate (SO4)	mg/L	-	-	0.5	1.6	1.61	12.1	375	41.1	89.5	25.5	504	5	36.2	6.93
Dissolved Organic Carbon	mg/L	-	-	0.5	2.93	3.21	2.18	2.77	4.21	2.87	3.73	2.24	3.56	3.92	4.49
Total Organic Carbon	mg/L	-	-	0.5	2.71	2.96	2.04	2.84	4.57	2.51	3.6	2.15	3.64	4.01	4.45
Aluminum (Al)-Total	mg/L	0.1	-	0.003	0.091	0.118	0.0105	0.229	1.17	0.0957	0.0349	0.014	0.0358	0.0402	<0.0030
Antimony (Sb)-Total	mg/L	-	0.1	0.0001	<0.00010	<0.00010	<0.00010	0.00012	0.00015	0.00024	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	0.005	0.05	0.0001	0.00017	0.00016	0.00023	0.00064	0.00171	0.00049	0.00075	0.00037	0.00024	0.00123	0.00061
Barium (Ba)-Total	mg/L	-	1	0.00005	0.0207	0.0207	0.0312	0.0919	0.0843	0.118	0.0311	0.0917	0.0287	0.023	0.0952
Beryllium (Be)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd)-Total (Lab Result)	mg/L	0.00033	0.02	0.00001	0.000013	0.000013	0.00001	0.000159	0.000052	0.000127	0.000041	0.000208	0.000011	0.000014	<0.000010
Cadmium (Cd)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.00001	0.000007	0.000007	0.000023	0.000126	0.000053	0.000108	0.000025	0.000156	0.000011	0.000027	0.000066
Calcium (Ca)-Total	mg/L	-	-	0.02	4.93	4.64	21.1	123	42.2	90.3	21.1	162	9.31	21.5	58.9
Chromium (Cr)-Total	mg/L	0.0089	-	0.0001	0.00025	0.00028	0.00012	0.00064	0.00275	0.00049	0.00014	0.00015	0.00013	0.00013	0.00012
Cobalt (Co)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	0.00021	0.00073	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper (Cu)-Total (Lab Result)	mg/L	0.002	0.2	0.0005	0.00088	0.00091	0.00055	0.00109	0.00324	0.00132	0.00073	0.00096	0.00063	0.00075	<0.00050
Copper (Cu)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.0005	0.00048	0.00047	0.00162	0.00891	0.00380	0.00763	0.00179	0.01103	0.00082	0.00196	0.00467
Iron (Fe)-Total	mg/L	0.3	-	0.01	0.109	0.142	0.011	0.327	1.6	0.156	0.092	0.042	0.026	0.201	0.024
Lead (Pb)-Total (Lab Result)	mg/L	0.003	0.2	0.00005	0.00182	0.00344	0.000069	0.000359	0.00143	0.000345	0.000154	0.000145	<0.000050	0.00012	<0.000050
Lead (Pb)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.00005	0.000294	0.000289	0.001806	0.022939	0.006440	0.018227	0.002102	0.031531	0.000652	0.002414	0.008781
Lithium (Li)-Total	mg/L	-	-	0.0005	0.00106	0.00117	0.00081	0.00863	0.00359	0.00241	<0.00050	0.00978	<0.00050	<0.00050	0.00279
Magnesium (Mg)-Total	mg/L	-	-	0.005	1.02	0.95	35.2	38.2	43.3	35.5	43.7	18.3	1.76	6.05	18.4
Manganese (Mn)-Total	mg/L	-	-	0.00005	0.00415	0.00499	0.000491	0.105	0.0662	0.00283	0.00583	0.161	0.000809	0.0212	0.0124
Molybdenum (Mo)-Total	mg/L	0.0073	0.5	0.00005	0.000062	0.000063	0.000127	0.000803	0.000693	0.00266	0.000611	0.000521	0.000103	0.000074	0.000184
Nickel (Ni)-Total (Lab Result)	mg/L	0.1	0.5	0.0005	<0.00050	<0.00050	<0.00050	0.00175	0.00378	0.00147	<0.00050	0.001	<0.00050	<0.00050	<0.00050
Nickel (Ni)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.0005	0.02306	0.02283	0.06817	0.31085	0.14560	0.27098	0.07462	0.37586	0.03711	0.08105	0.17522
Phosphorous (P)-Total	mg/L	-	-	0.3	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	mg/L	-	-	0.05	0.22	0.2	0.64	1.35	1.1	1.04	0.38	1.4	0.36	0.32	0.49
Selenium (Se)-Total	mg/L	0.001	0.05	0.0001	<0.00010	<0.00010	<0.00010	0.00093	0.00025	0.00347	<0.00010	0.00038	<0.00010	<0.00010	0.00024
Silicon (Si)-Total	mg/L	-	-	0.05	7.65	7.08	5.25	4.46	6.94	4.23	4.95	3.7	5.1	5.51	5.73
Silver (Ag)-Total	mg/L	0.0001	0.1	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	0.000015	0.000014	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	-	-	0.05	1.94	1.88	1.98	3.34	3	2.37	1.67	3.24	1.58	1.76	2.38
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.0304	0.0286	0.139	0.491	0.209	0.32	0.103	0.564	0.05	0.0941	0.318
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	<0.000010	0.000065	0.000015	<0.000010	<0.000010	0.000094	<0.000010	<0.000010	<0.000010
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	0.03	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.000133	0.000132	0.00187	0.0036	0.00219	0.00633	0.00126	0.00323	0.000386	0.00112	0.000784
Vanadium (V)-Total	mg/L	-	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	0.0029	0.002	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)-Total	mg/L	0.03	0.5	0.003	0.0038	0.0039	<0.0030	0.0247	0.0116	0.0082	0.0167	0.0326	<0.0030	0.0248	0.0069
Aluminum (Al)-Dissolved	mg/L	0.1	-	0.003	0.0269	0.027	0.0058	0.0044	0.007	0.0011	0.019	0.0055	0.0234	0.0263	0.0017
Antimony (Sb)-Dissolved	mg/L	-	0.1	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00022	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic (As)-Dissolved	mg/L	0.005	0.05	0.0001	0.00011	0.0001	0.00022	0.00046	0.00087	0.00036	0.00074	0.00033	0.00021	0.00114	0.00057
Barium (Ba)-Dissolved	mg/L	-	1	0.00005	0.019	0.0192	0.0309	0.0883	0.0623	0.12	0.031	0.0938	0.0282	0.0226	0.0942
Beryllium (Be)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd)-Dissolved (Lab Result)	mg/L	0.00033	0.02	0.00001	0.000012	0.00001	<0.000010	0.000151	0.000011	0.000102	0.000028	0.000217	0.000013	0.000013	<0.000010
Cadmium (Cd)-Diss. (Hardness Adjusted Guideline)	mg/L	-	-	0.00001	0.000007	0.000007	0.000023	0.000126	0.000053	0.000108	0.000025	0.000156	0.000011	0.000027	0.000066



Table C-1. Water Quality Parameter Guideline Exceedances; August 12-13, 2013.

Analyte	Units	CCME-WATER-FAL	Faro Effluent Quality Standards	Station ID	FC	DUPLICATE #2 -FC	K8	V8	VW1	VW2	VW3	VGMAIN	VR	V17A	V20A
				Date Sampled Time	13-AUG-13 10:30 Water	13-AUG-13 10:30 Water	13-AUG-13 13:20 Water	13-AUG-13 16:20 Water	13-AUG-13 15:40 Water	13-AUG-13 16:04 Water	13-AUG-13 15:20 Water	13-AUG-13 16:57 Water	13-AUG-13 09:38 Water	13-AUG-13 09:22 Water	12-AUG-13 19:08 Water
Calcium (Ca)-Dissolved	mg/L	-	-	0.02	4.62	4.61	21.1	125	44.9	94.4	21	168	8.86	22.2	59
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	0.00012	0.00012	<0.00010	<0.00010	<0.00010	0.00015	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper (Cu)-Dissolved (Lab Result)	mg/L	0.002	0.2	0.0005	0.00062	0.00061	0.00044	0.0007	0.00077	0.00049	0.0006	0.00063	0.00056	0.0006	0.00029
<i>Copper (Cu)-Diss. (Hardness Adjusted Guideline)</i>	mg/L	-	-	0.0005	0.00048	0.00047	0.00162	0.00891	0.00380	0.00763	0.00179	0.01103	0.00082	0.00196	0.00467
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	0.028	0.028	<0.010	<0.010	0.054	<0.010	0.068	<0.010	0.013	0.158	0.019
Lead (Pb)-Dissolved (Lab Result)	mg/L	0.003	0.2	0.00005	0.00076	0.00094	<0.000050	<0.000050	0.000056	<0.000050	0.000051	<0.000050	<0.000050	<0.000050	<0.000050
<i>Lead (Pb)-Diss. (Hardness Adjusted Guideline)</i>	mg/L	-	-	0.00005	0.000294	0.000289	0.001806	0.022939	0.006440	0.018227	0.002102	0.031531	0.000652	0.002414	0.008781
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	0.00081	0.0009	0.00075	0.00813	0.00209	0.00256	<0.00050	0.0102	<0.00050	<0.00050	0.00288
Magnesium (Mg)-Dissolved	mg/L	-	-	0.005	0.93	0.91	2.81	39	15.2	38.4	4.83	45.5	1.63	6.11	18
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.00283	0.00285	0.000241	0.0968	0.0404	<0.000050	0.0053	0.161	0.000403	0.0202	0.0112
Molybdenum (Mo)-Dissolved	mg/L	0.0073	0.5	0.00005	0.000058	<0.000050	0.000107	0.000756	0.000619	0.00263	0.000101	0.000497	0.000093	0.00008	0.000168
Nickel (Ni)-Dissolved (Lab Result)	mg/L	0.1	0.5	0.0005	<0.00050	<0.00050	<0.00050	0.00125	0.00062	0.00101	<0.00050	0.00094	<0.00050	<0.00050	<0.00050
<i>Nickel (Ni)-Diss. (Hardness Adjusted Guideline)</i>	mg/L	-	-	0.0005	0.02306	0.02283	0.06817	0.31085	0.14560	0.27098	0.07462	0.37586	0.03711	0.08105	0.17522
Phosphorus (P)-Dissolved	mg/L	-	-	0.3	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	-	-	0.05	0.17	0.16	0.6	1.27	0.79	1.03	0.34	1.37	0.35	0.29	0.46
Selenium (Se)-Dissolved	mg/L	0.001	0.05	0.0001	<0.00010	<0.00010	<0.00010	0.00096	0.00024	0.00382	<0.00010	0.00041	<0.00010	<0.00010	0.00029
Silicon (Si)-Dissolved	mg/L	-	-	0.05	7.07	6.95	5.2	4.15	5.24	4.29	4.88	3.83	4.83	5.58	5.75
Silver (Ag)-Dissolved	mg/L	0.0001	0.1	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)-Dissolved	mg/L	-	-	0.05	1.87	1.9	1.96	3.31	3.01	2.46	1.63	3.31	1.53	1.71	2.34
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.0286	0.0284	0.135	0.491	0.207	0.329	0.0988	0.591	0.0478	0.0893	0.304
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	<0.000010	0.000064	<0.000010	<0.000010	<0.000010	0.000098	<0.000010	<0.000010	<0.000010
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.000118	0.00012	0.00184	0.00371	0.00211	0.00648	0.00128	0.00333	0.000354	0.00109	0.000782
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)-Dissolved	mg/L	0.03	0.5	0.003	0.0033	0.0028	<0.0010	0.0199	0.0032	0.0033	0.0156	0.0315	0.0012	0.0232	0.006

Applied Guidelines: Federal CCME Canadian Environmental Quality Guidelines - CCME - Freshwater Aquatic Life
Faro Effluent Quality Standards

Color Key:	Exceeds CCME Guideline
	Exceeds Faro Effluent Quality Standards
	Exceeds both CCME and Faro Standards
	Exceeds Hardness Dependent Calculated Guideline (CCME)



Table C-1. Water Quality Parameter Guideline Exceedances; August 12-13, 2013.

Analyte	Units	CCME-WATER-FAL	Faro Effluent Quality Standards	Station ID	USFR	GCULV	A1	P1	P4	R1	R4	R5	R6	DUPLICATE #1 - R6	NWID
				Date Sampled Time	13-AUG-13 09:56	13-AUG-13 15:06	12-AUG-13 16:00	12-AUG-13 19:30	12-AUG-13 15:40	13-AUG-13 12:30	12-AUG-13 17:00	13-AUG-13 16:36	12-AUG-13 17:00	12-AUG-13 17:05	13-AUG-13 12:55
				Detection Limit	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Temperature (in-situ)	°C	-	-	-	11.5	14.4	14.5	18.7	18.6	10.9	12.9	12.0	11.2	-	10.4
Specific Conductivity (in-situ)	µS/cm	-	-	-	375.0	60.0	255.0	322.0	326.0	190.0	277.0	266.0	259.0	-	2346.0
pH (in-situ)	-	6.5 - 9.0	6.5	-	7.62	7.11	7.84	7.00	7.60	7.91	8.19	8.26	8.15	-	7.26
Hardness (as CaCO3)	mg/L	-	-	0.5	25.3	26.9	143	178	190	94.8	147	143	148	142	1530
pH (lab)	pH	6.5 - 9.0	6.5	0.1	7.56	7.74	8.38	8.35	8.33	8.17	8.25	8.33	8.29	8.28	7.74
Total Suspended Solids	mg/L	-	15	1.0	2.8	<1.0	41.7	3.4	5.1	<1.0	<1.0	<1.0	<1.0	<1.0	35.5
Total Dissolved Solids	mg/L	-	-	3.0	43.1	45.1	172	223	226	122	185	169	163	168	2430
Alkalinity, Total (as CaCO3)	mg/L	-	-	2.0	25	27	114	115	114	86.3	109	121	130	131	160
Ammonia, Total (as N)	mg/L	0.75	1.3	0.005	<0.0050	<0.0050	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0214
Chloride (Cl)	mg/L	120	-	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<10
Fluoride (F)	mg/L	0.12	-	0.02	0.068	0.072	0.095	0.132	0.133	0.118	0.109	0.088	0.071	0.071	<0.40
Nitrate (as N)	mg/L	3.0	-	0.005	<0.0050	0.0088	0.0117	0.0065	0.0053	0.02	0.0361	0.0317	0.0311	0.0288	0.41
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.020
Phosphorous (P), Total	mg/L	-	-	0.002	0.005	0.0043	0.0587	0.0056	0.0089	0.004	<0.0020	0.0025	0.003	0.0035	0.0094
Sulfate (SO4)	mg/L	-	-	0.5	5.16	5.33	33.2	66.8	67.7	16.8	49.2	32.9	21.5	21.5	1490
Dissolved Organic Carbon	mg/L	-	-	0.5	2.86	2.6	2.71	2.94	2.85	3.08	2.58	2.49	2.33	2.66	3.28
Total Organic Carbon	mg/L	-	-	0.5	2.87	2.66	3.23	2.91	2.89	3.03	2.51	2.36	2.12	2.48	3.77
Aluminum (Al)-Total	mg/L	0.1	-	0.003	0.0665	0.0249	1.22	0.0666	0.0858	0.0138	0.0117	0.0226	0.0247	0.0235	0.754
Antimony (Sb)-Total	mg/L	-	0.1	0.0001	<0.00010	<0.00010	0.00031	0.00022	0.00022	<0.00010	0.00012	0.00012	0.00015	0.00013	<0.00050
Arsenic (As)-Total	mg/L	0.005	0.05	0.0001	0.00039	0.00042	0.00176	0.00065	0.00065	0.00047	0.00037	0.00046	0.00048	0.00047	0.00308
Barium (Ba)-Total	mg/L	-	1	0.00005	0.0295	0.0288	0.103	0.0782	0.0781	0.0467	0.0595	0.0637	0.0713	0.0685	0.0636
Beryllium (Be)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00050
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0025
Boron (B)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050
Cadmium (Cd)-Total (Lab Result)	mg/L	0.00033	0.02	0.00001	<0.000010	<0.000010	0.000098	0.000086	0.000084	<0.000010	0.000016	0.000015	0.000019	0.000018	0.0211
Cadmium (Cd)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.00001	0.000010	0.000011	0.000045	0.000054	0.000058	0.000032	0.000046	0.000045	0.000046	0.000045	0.000346
Calcium (Ca)-Total	mg/L	-	-	0.02	8.23	8.85	39.3	44.5	44.6	28.8	43	39.3	40.5	38.9	275
Chromium (Cr)-Total	mg/L	0.0089	-	0.0001	0.00019	0.00013	0.00247	0.00022	0.00031	0.00014	0.0002	0.00022	0.00017	0.00019	0.00091
Cobalt (Co)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	0.00072	<0.00010	<0.00010	<0.00010	0.00016	<0.00010	<0.00010	<0.00010	0.0181
Copper (Cu)-Total (Lab Result)	mg/L	0.002	0.2	0.0005	0.00051	<0.00050	0.00354	0.00085	0.00115	0.00084	0.00082	0.00071	0.00063	0.00059	0.0298
Copper (Cu)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.0005	0.00073	0.00077	0.00321	0.00387	0.00409	0.00226	0.00329	0.00321	0.00331	0.00319	0.02433
Iron (Fe)-Total	mg/L	0.3	-	0.01	0.208	0.137	1.79	0.116	0.166	0.261	0.2	0.182	0.145	0.136	5.42
Lead (Pb)-Total (Lab Result)	mg/L	0.003	0.2	0.00005	0.000144	<0.000050	0.00128	0.000066	0.000276	<0.000050	0.00016	0.000074	<0.000050	<0.000050	0.107
Lead (Pb)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.00005	0.000553	0.000598	0.005016	0.006629	0.007203	0.002972	0.005196	0.005016	0.005241	0.004972	0.102508
Lithium (Li)-Total	mg/L	-	-	0.0005	<0.00050	<0.00050	0.00214	0.00251	0.00176	0.00071	0.00219	0.00103	0.00083	0.00078	0.0232
Magnesium (Mg)-Total	mg/L	-	-	0.005	1.31	1.42	9.92	16.2	16.2	5.59	9.88	11.1	10.8	10.8	207
Manganese (Mn)-Total	mg/L	-	-	0.00005	0.0166	0.00657	0.0671	0.00924	0.0147	0.0261	0.252	0.111	0.0151	0.0146	2.4
Molybdenum (Mo)-Total	mg/L	0.0073	0.5	0.00005	0.000298	0.000286	0.00116	0.00129	0.0014	0.000281	0.000643	0.000972	0.0012	0.00119	0.0003
Nickel (Ni)-Total (Lab Result)	mg/L	0.1	0.5	0.0005	<0.00050	<0.00050	0.00331	0.00221	0.00233	<0.00050	0.00105	0.00074	<0.00050	<0.00050	0.09
Nickel (Ni)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.0005	0.03363	0.03523	0.12543	0.14814	0.15567	0.09178	0.12809	0.12543	0.12875	0.12476	0.75983
Phosphorus (P)-Total	mg/L	-	-	0.3	<0.050	<0.050	0.055	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	mg/L	-	-	0.05	0.34	0.35	1.77	0.83	0.89	0.93	1.14	1.11	1.12	1.1	6.24
Selenium (Se)-Total	mg/L	0.001	0.05	0.0001	<0.00010	<0.00010	0.00064	0.00109	0.00099	0.00017	0.00047	0.00057	0.00069	0.00067	0.00055
Silicon (Si)-Total	mg/L	-	-	0.05	3.18	3.29	7.75	2.99	3.03	4.16	4.57	4.31	4.46	4.21	7.05
Silver (Ag)-Total	mg/L	0.0001	0.1	0.00001	<0.000010	<0.000010	0.000034	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000124
Sodium (Na)-Total	mg/L	-	-	0.05	1.49	1.54	2.08	1.71	1.7	2.04	2.66	2.04	1.73	1.71	15.9
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.0513	0.0534	0.144	0.198	0.203	0.158	0.173	0.137	0.123	0.115	1.52
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	0.000029	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000315
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	0.0002	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00050
Titanium (Ti)-Total	mg/L	-	-	0.01	<0.010	<0.010	0.037	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.000438	0.000472	0.00172	0.00173	0.00176	0.00152	0.00138	0.00152	0.00173	0.00165	0.00289
Vanadium (V)-Total	mg/L	-	-	0.001	<0.0010	<0.0010	0.0055	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
Zinc (Zn)-Total	mg/L	0.03	0.5	0.003	<0.0030	<0.0030	0.0137	0.0054	0.0053	<0.0030	0.0099	0.005	<0.0030	<0.0030	30
Aluminum (Al)-Dissolved	mg/L	0.1	-	0.003	0.0089	0.0111	0.0053	0.0119	0.0105	0.0051	0.0038	0.0058	0.0061	0.0052	0.0156
Antimony (Sb)-Dissolved	mg/L	-	0.1	0.0001	<0.00010	<0.00010	0.00016	0.0002	0.0002	<0.00010	0.0001	0.00012	0.00013	0.00013	<0.00050
Arsenic (As)-Dissolved	mg/L	0.005	0.05	0.0001	0.00031	0.00038	0.00066	0.00055	0.00056	0.00042	0.00032	0.00039	0.00041	0.00045	<0.00050
Barium (Ba)-Dissolved	mg/L	-	1	0.00005	0.0278	0.0311	0.056	0.0767	0.0765	0.0474	0.0584	0.0656	0.0702	0.0706	0.0329
Beryllium (Be)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00050
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0025
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050
Cadmium (Cd)-Dissolved (Lab Result)	mg/L	0.00033	0.02	0.00001	<0.000010	<0.000010	<0.000010	0.00007	0.000059	<0.000010	0.000016	0.000016	0.000016	0.000013	0.0194
Cadmium (Cd)-Diss. (Hardness Adjusted Guideline)	mg/L	-	-	0.00001	0.000010	0.000011	0.000045	0.000054	0.000058	0.000032	0.000046	0.000045	0.000046	0.000045	0.000346



Table C-1. Water Quality Parameter Guideline Exceedances; August 12-13, 2013.

Analyte	Units	CCME-WATER-FAL	Faro Effluent Quality Standards	Station ID	USFR	GCULV	A1	P1	P4	R1	R4	R5	R6	DUPLICATE #1 - R6	NWID
				Date Sampled Time	13-AUG-13 09:56	13-AUG-13 15:06	12-AUG-13 16:00	12-AUG-13 19:30	12-AUG-13 15:40	13-AUG-13 12:30	12-AUG-13 17:00	13-AUG-13 16:36	12-AUG-13 17:00	12-AUG-13 17:05	13-AUG-13 12:55
				Detection Limit	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Calcium (Ca)-Dissolved	mg/L	-	-	0.02	8.09	8.55	40.9	44.8	47.7	29	43.1	40.1	40.7	39.4	275
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00011	<0.00010	<0.00010	<0.00010	<0.00050
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00013	<0.00010	<0.00010	<0.00010	0.0177
Copper (Cu)-Dissolved (Lab Result)	mg/L	0.002	0.2	0.0005	0.00039	0.00039	0.00072	0.00066	0.00069	0.00049	0.00064	0.00055	0.0005	0.00051	0.005
<i>Copper (Cu)-Diss. (Hardness Adjusted Guideline)</i>	mg/L	-	-	0.0005	0.00073	0.00077	0.00321	0.00387	0.00409	0.00226	0.00329	0.00321	0.00331	0.00319	0.02433
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	0.083	0.085	0.017	0.012	0.012	0.181	0.128	0.1	0.078	0.078	0.97
Lead (Pb)-Dissolved (Lab Result)	mg/L	0.003	0.2	0.00005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000055	<0.000050	<0.000050	<0.000050	0.00305
<i>Lead (Pb)-Diss. (Hardness Adjusted Guideline)</i>	mg/L	-	-	0.00005	0.000553	0.000598	0.005016	0.006629	0.007203	0.002972	0.005196	0.005016	0.005241	0.004972	0.102508
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	<0.00050	<0.00050	0.00111	0.00245	0.00172	0.00083	0.00198	0.00121	0.00062	0.0007	0.0226
Magnesium (Mg)-Dissolved	mg/L	-	-	0.005	1.24	1.35	9.84	16	17.2	5.47	9.64	10.3	11.2	10.7	206
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.00373	0.00232	0.0328	0.00404	0.00679	0.0241	0.228	0.104	0.0117	0.012	2.33
Molybdenum (Mo)-Dissolved	mg/L	0.0073	0.5	0.00005	0.000294	0.000288	0.000972	0.00129	0.00134	0.000275	0.000604	0.000914	0.00115	0.00112	0.00026
Nickel (Ni)-Dissolved (Lab Result)	mg/L	0.1	0.5	0.0005	<0.00050	<0.00050	0.00067	0.00202	0.00189	<0.00050	0.00095	0.0006	<0.00050	<0.00050	0.0868
<i>Nickel (Ni)-Diss. (Hardness Adjusted Guideline)</i>	mg/L	-	-	0.0005	0.03363	0.03523	0.12543	0.14814	0.15567	0.09178	0.12809	0.12543	0.12875	0.12476	0.75983
Phosphorus (P)-Dissolved	mg/L	-	-	0.3	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	-	-	0.05	0.31	0.32	1.29	0.79	0.87	0.85	1.06	1.09	1.12	1.06	5.88
Selenium (Se)-Dissolved	mg/L	0.001	0.05	0.0001	<0.00010	<0.00010	0.00061	0.00113	0.00111	0.00014	0.00049	0.00063	0.0008	0.00078	0.00058
Silicon (Si)-Dissolved	mg/L	-	-	0.05	3.01	3.15	4.57	2.86	3.06	4.15	4.54	4.36	4.5	4.23	6.27
Silver (Ag)-Dissolved	mg/L	0.0001	0.1	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000043	<0.000050
Sodium (Na)-Dissolved	mg/L	-	-	0.05	1.48	1.6	2.12	1.75	1.71	2.05	2.54	2.08	1.7	1.73	15.6
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.0492	0.0522	0.145	0.197	0.213	0.155	0.167	0.136	0.123	0.119	1.51
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000243
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00050
Titanium (Ti)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.000358	0.000435	0.00162	0.0017	0.00179	0.00146	0.0013	0.00149	0.00169	0.00171	0.00276
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050
Zinc (Zn)-Dissolved	mg/L	0.03	0.5	0.003	<0.0010	0.001	<0.0010	0.0034	0.0015	0.0016	0.0074	0.0038	<0.0010	0.0011	27.9

Applied Guidelines: Federal CCME Canadian Environmental Quality Guidelines - CCME - Fresh
Faro Effluent Quality Standards

Color Key:	Exceeds CCME Guideline
	Exceeds Faro Effluent Quality Standards
	Exceeds both CCME and Faro Standards
	Exceeds Hardness Dependent Calculated Guideline (CCME)



Table C-1. Water Quality Parameter Guideline Exceedances; August 12-13, 2013.

Analyte	Units	CCME-WATER-FAL	Faro Effluent Quality Standards	Station ID	W10	X14	TRAVEL BLANK	FIELD BLANK
				Date Sampled Time	13-AUG-13 11:35 Water	13-AUG-13 12:00 Water	13-AUG-13 00:00 Water	13-AUG-13 16:30 Water
				Detection Limit				
Temperature (in-situ)	°C	-	-	-	6.6	11.0	-	-
Specific Conductivity (in-situ)	µS/cm	-	-	-	115.0	325.0	-	-
pH (in-situ)	-	6.5 - 9.0	6.5	-	7.50	7.71	-	-
Hardness (as CaCO3)	mg/L	-	-	0.5	58.1	169	<0.50	<0.50
pH (lab)	pH	6.5 - 9.0	6.5	0.1	7.92	8.12	5.87	5.93
Total Suspended Solids	mg/L	-	15	1.0	<1.0	<1.0	<1.0	<1.0
Total Dissolved Solids	mg/L	-	-	3.0	85.2	201	<3.0	<3.0
Alkalinity, Total (as CaCO3)	mg/L	-	-	2.0	60.4	112	<1.0	<1.0
Ammonia, Total (as N)	mg/L	0.75	1.3	0.005	<0.0050	0.0188	<0.0050	<0.0050
Chloride (Cl)	mg/L	120	-	0.5	<0.50	<0.50	<0.50	<0.50
Fluoride (F)	mg/L	0.12	-	0.02	0.097	0.117	<0.020	<0.020
Nitrate (as N)	mg/L	3.0	-	0.005	<0.0050	0.0252	<0.0050	<0.0050
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorous (P), Total	mg/L	-	-	0.002	0.0021	<0.0020	<0.0020	<0.0020
Sulfate (SO4)	mg/L	-	-	0.5	3	64	<0.50	<0.50
Dissolved Organic Carbon	mg/L	-	-	0.5	3.9	2.9	-	<0.50
Total Organic Carbon	mg/L	-	-	0.5	3.63	2.79	<0.50	<0.50
Aluminum (Al)-Total	mg/L	0.1	-	0.003	0.0222	0.0177	<0.0030	<0.0030
Antimony (Sb)-Total	mg/L	-	0.1	0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	0.005	0.05	0.0001	0.00015	0.00057	<0.00010	<0.00010
Barium (Ba)-Total	mg/L	-	1	0.00005	0.0191	0.0558	<0.000050	<0.000050
Beryllium (Be)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd)-Total (Lab Result)	mg/L	0.00033	0.02	0.00001	0.000023	0.000026	<0.000010	<0.000010
<i>Cadmium (Cd)-Total (Hardness Adjusted Guideline)</i>	mg/L	-	-	<i>0.00001</i>	<i>0.000021</i>	<i>0.000052</i>	-	-
Calcium (Ca)-Total	mg/L	-	-	0.02	18.9	47.2	<0.050	<0.050
Chromium (Cr)-Total	mg/L	0.0089	-	0.0001	0.00017	0.00017	<0.00010	<0.00010
Cobalt (Co)-Total	mg/L	-	-	0.0001	<0.00010	0.00069	<0.00010	<0.00010
Copper (Cu)-Total (Lab Result)	mg/L	0.002	0.2	0.0005	0.00208	0.00068	<0.00050	<0.00050
<i>Copper (Cu)-Total (Hardness Adjusted Guideline)</i>	mg/L	-	-	<i>0.0005</i>	<i>0.00149</i>	<i>0.00370</i>	-	-
Iron (Fe)-Total	mg/L	0.3	-	0.01	0.019	0.503	<0.010	<0.010
Lead (Pb)-Total (Lab Result)	mg/L	0.003	0.2	0.00005	0.000078	0.00035	<0.000050	<0.000050
<i>Lead (Pb)-Total (Hardness Adjusted Guideline)</i>	mg/L	-	-	<i>0.00005</i>	<i>0.001594</i>	<i>0.006205</i>	-	-
Lithium (Li)-Total	mg/L	-	-	0.0005	<0.00050	0.00292	<0.00050	<0.00050
Magnesium (Mg)-Total	mg/L	-	-	0.005	2.49	11.2	<0.10	<0.10
Manganese (Mn)-Total	mg/L	-	-	0.00005	0.000319	0.912	<0.000050	<0.000050
Molybdenum (Mo)-Total	mg/L	0.0073	0.5	0.00005	0.000198	0.00061	<0.000050	<0.000050
Nickel (Ni)-Total (Lab Result)	mg/L	0.1	0.5	0.0005	<0.00050	0.00195	<0.00050	<0.00050
<i>Nickel (Ni)-Total (Hardness Adjusted Guideline)</i>	mg/L	-	-	<i>0.0005</i>	<i>0.06326</i>	<i>0.14241</i>	-	-
Phosphorus (P)-Total	mg/L	-	-	0.3	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total	mg/L	-	-	0.05	0.54	1.07	<0.10	<0.10
Selenium (Se)-Total	mg/L	0.001	0.05	0.0001	<0.00010	0.00027	<0.00010	<0.00010
Silicon (Si)-Total	mg/L	-	-	0.05	6.97	4.61	<0.050	<0.050
Silver (Ag)-Total	mg/L	0.0001	0.1	0.00001	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	-	-	0.05	2.01	3.04	<0.050	<0.050
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.0671	0.187	<0.00020	<0.00020
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.000135	0.00161	<0.000010	<0.000010
Vanadium (V)-Total	mg/L	-	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010
Zinc (Zn)-Total	mg/L	0.03	0.5	0.003	0.0038	0.0286	<0.0030	<0.0030
Aluminum (Al)-Dissolved	mg/L	0.1	-	0.003	0.0089	0.0047	-	<0.0010
Antimony (Sb)-Dissolved	mg/L	-	0.1	0.0001	<0.00010	<0.00010	-	<0.00010
Arsenic (As)-Dissolved	mg/L	0.005	0.05	0.0001	0.00014	0.0005	-	<0.00010
Barium (Ba)-Dissolved	mg/L	-	1	0.00005	0.0189	0.0564	-	0.000061
Beryllium (Be)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	-	<0.00010
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.00050	<0.00050	-	<0.00050
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	-	<0.010
Cadmium (Cd)-Dissolved (Lab Result)	mg/L	0.00033	0.02	0.00001	0.000022	0.000027	-	<0.000010
<i>Cadmium (Cd)-Diss. (Hardness Adjusted Guideline)</i>	mg/L	-	-	<i>0.00001</i>	<i>0.000021</i>	<i>0.000052</i>	-	-



Table C-1. Water Quality Parameter Guideline Exceedances; August 12-13, 2013.

Analyte	Units	CCME-WATER-FAL	Faro Effluent Quality Standards	Station ID	W10	X14	TRAVEL BLANK	FIELD BLANK
				Date Sampled Time	13-AUG-13 11:35 Water	13-AUG-13 12:00 Water	13-AUG-13 00:00 Water	13-AUG-13 16:30 Water
Calcium (Ca)-Dissolved	mg/L	-	-	0.02	19.2	48.6	-	<0.050
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	<0.00010	<0.00010	-	<0.00010
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	<0.00010	0.00067	-	<0.00010
Copper (Cu)-Dissolved (Lab Result)	mg/L	0.002	0.2	0.0005	0.00102	0.00053	-	<0.00020
<i>Copper (Cu)-Diss. (Hardness Adjusted Guideline)</i>	mg/L	-	-	0.0005	0.00149	0.00370	-	-
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	<0.010	0.356	-	<0.010
Lead (Pb)-Dissolved (Lab Result)	mg/L	0.003	0.2	0.00005	<0.000050	0.000138	-	<0.000050
<i>Lead (Pb)-Diss. (Hardness Adjusted Guideline)</i>	mg/L	-	-	0.00005	0.001594	0.006205	-	-
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	<0.00050	0.00277	-	<0.00050
Magnesium (Mg)-Dissolved	mg/L	-	-	0.005	2.48	11.4	-	<0.10
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.000099	0.899	-	<0.000050
Molybdenum (Mo)-Dissolved	mg/L	0.0073	0.5	0.00005	0.000185	0.000569	-	<0.000050
Nickel (Ni)-Dissolved (Lab Result)	mg/L	0.1	0.5	0.0005	<0.00050	0.00191	-	<0.00050
<i>Nickel (Ni)-Diss. (Hardness Adjusted Guideline)</i>	mg/L	-	-	0.0005	0.06326	0.14241	-	-
Phosphorus (P)-Dissolved	mg/L	-	-	0.3	<0.050	<0.050	-	<0.050
Potassium (K)-Dissolved	mg/L	-	-	0.05	0.5	1.05	-	<0.10
Selenium (Se)-Dissolved	mg/L	0.001	0.05	0.0001	<0.00010	0.00027	-	<0.00010
Silicon (Si)-Dissolved	mg/L	-	-	0.05	7.07	4.75	-	<0.050
Silver (Ag)-Dissolved	mg/L	0.0001	0.1	0.00001	<0.000010	<0.000010	-	<0.000010
Sodium (Na)-Dissolved	mg/L	-	-	0.05	1.93	3.02	-	0.17
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.0652	0.183	-	<0.00020
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	-	<0.000010
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	-	<0.00010
Titanium (Ti)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	-	<0.010
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.000128	0.0016	-	<0.000010
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.0010	<0.0010	-	<0.0010
Zinc (Zn)-Dissolved	mg/L	0.03	0.5	0.003	0.0015	0.0251	-	<0.0010

Applied Guidelines: Federal CCME Canadian Environmental Quality Guidelines - CCME - Fresh
Faro Effluent Quality Standards

Color Key:	Exceeds CCME Guideline
	Exceeds Faro Effluent Quality Standards
	Exceeds both CCME and Faro Standards
	Exceeds Hardness Dependent Calculated Guideline (CCME)



**APPENDIX D QA/QC RESULTS SUMMARY,
AUGUST 12-13, 2013**

Page is intentionally blank.



	R6	DUPLICATE #1 - R6	Detection Limit	QA/QC Category	Relative Percent Difference	FC	DUPLICATE #2 - FC	Detection Limit	QA/QC Category	Relative Percent Difference	FIELD	TRAVEL
Date Sampled	12-AUG-13	12-AUG-13	DL		% RPD	13-AUG-13	13-AUG-13	DL		% RPD	13-AUG-13	13-AUG-13
Time Sampled	17:00	17:05				10:30	10:30				16:30	00:00
Physical Tests												
Hardness (as CaCO3)	148.00	142.00	0.50	RPD	4.1	15.40	15.20	0.50	RPD	1.3	<0.50	<0.50
pH	8.29	8.28	0.10	RPD	0.1	7.55	7.51	0.10	RPD	0.5	5.93	5.87
Total Suspended Solids	<1.0	<1.0	1.0	<DL	<DL	1.0	2.9	1.0	<2XDL	OK	<1.0	<1.0
Total Dissolved Solids	163.0	168.0	3.0	RPD	-3.0	37.8	41.0	3.0	RPD	-8.1	<3.0	<3.0
Anions and Nutrients												
Alkalinity, Total (as CaCO3)	130.0	131.0	2.0	RPD	-0.8	17.3	17.4	2.0	RPD	-0.6	<1.0	<1.0
Ammonia, Total (as N)	<0.0050	<0.0050	0.0050	<DL	<DL	<0.0050	<0.0050	0.0050	<DL	<DL	<0.0050	<0.0050
Chloride (Cl)	<0.50	<0.50	0.50	<DL	<DL	<0.50	<0.50	0.50	<DL	<DL	<0.50	<0.50
Fluoride (F)	0.071	0.071	0.020	<2XDL	OK	0.082	0.083	0.020	<2XDL	OK	<0.020	<0.020
Nitrate (as N)	0.0311	0.0288	0.0050	RPD	7.7	<0.0050	<0.0050	0.0050	<DL	OK	<0.0050	<0.0050
Nitrite (as N)	<0.0010	0.0011	0.0010	<DL	<DL	<0.0010	<0.0010	0.0010	<DL	<DL	<0.0010	<0.0010
Phosphorus (P)-Total	0.0030	0.0035	0.0020	<2XDL	OK	0.0036	0.0058	0.0020	<2XDL	OK	<0.0020	<0.0020
Sulfate (SO4)	21.50	21.50	0.50	RPD	0.0	1.60	1.61	0.50	<2XDL	OK	<0.50	<0.50
Organic / Inorganic Carbon												
Dissolved Organic Carbon	2.33	2.66	0.50	<2XDL	OK	2.93	3.21	0.50	RPD	-9.1	<0.50	-
Total Organic Carbon	2.12	2.48	0.50	<2XDL	OK	2.71	2.96	0.50	RPD	-8.8	<0.50	<0.50
Total Metals												
Aluminum (Al)-Total	0.0247	0.0235	0.0030	RPD	5.0	0.0910	0.1180	0.0030	RPD	-25.8	<0.0030	<0.0030
Antimony (Sb)-Total	0.00015	0.00013	0.00010	<2XDL	OK	<0.00010	<0.00010	0.00010	<DL	<DL	<0.00010	<0.00010
Arsenic (As)-Total	0.00048	0.00047	0.00010	<2XDL	OK	0.00017	0.00016	0.00010	<2XDL	OK	<0.00010	<0.00010
Barium (Ba)-Total	0.071300	0.068500	0.000050	RPD	4.0	0.020700	0.020700	0.000050	RPD	0.0	<0.000050	<0.000050
Beryllium (Be)-Total	<0.00010	<0.00010	0.00010	<DL	<DL	<0.00010	<0.00010	0.00010	<DL	<DL	<0.00010	<0.00010
Bismuth (Bi)-Total	<0.00050	<0.00050	0.00050	<DL	<DL	<0.00050	<0.00050	0.00050	<DL	<DL	<0.00050	<0.00050
Boron (B)-Total	<0.010	<0.010	0.010	<DL	<DL	<0.010	<0.010	0.010	<DL	<DL	<0.010	<0.010
Cadmium (Cd)-Total	0.000019	0.000018	0.000010	<2XDL	OK	0.000013	0.000013	0.000010	<2XDL	OK	<0.000010	<0.000010
Calcium (Ca)-Total	40.500	38.900	0.020	RPD	4.0	4.930	4.640	0.020	RPD	6.1	<0.050	<0.050
Chromium (Cr)-Total	0.00017	0.00019	0.00010	<2XDL	OK	0.00025	0.00028	0.00010	<2XDL	OK	<0.00010	<0.00010
Cobalt (Co)-Total	<0.00010	<0.00010	0.00010	<DL	<DL	<0.00010	<0.00010	0.00010	<DL	<DL	<0.00010	<0.00010
Copper (Cu)-Total	0.00063	0.00059	0.00050	<2XDL	OK	0.00088	0.00091	0.00050	<2XDL	OK	<0.00050	<0.00050
Iron (Fe)-Total	0.145	0.136	0.010	RPD	6.4	0.109	0.142	0.010	RPD	-26.3	<0.010	<0.010
Lead (Pb)-Total	<0.000050	<0.000050	0.000050	<DL	<DL	0.001820	0.003440	0.000050	RPD	-61.6	<0.000050	<0.000050
Lithium (Li)-Total	0.00083	0.00078	0.00050	<2XDL	OK	0.00106	0.00117	0.00050	<2XDL	<DL	<0.00050	<0.00050
Magnesium (Mg)-Total	11.1000	10.8000	0.0050	RPD	2.7	1.0200	0.9500	0.0050	RPD	7.1	<0.10	<0.10
Manganese (Mn)-Total	0.015100	0.014600	0.000050	RPD	3.4	0.004150	0.004990	0.000050	RPD	-18.4	<0.000050	<0.000050
Molybdenum (Mo)-Total	0.001200	0.001190	0.000050	RPD	0.8	0.000062	0.000063	0.000050	<2XDL	OK	<0.000050	<0.000050
Nickel (Ni)-Total	<0.00050	<0.00050	0.00050	<DL	<DL	<0.00050	<0.00050	0.00050	<DL	<DL	<0.00050	<0.00050
Phosphorus (P)-Total	<0.050	<0.050	0.30	<DL	<DL	<0.050	<0.050	0.30	<DL	<DL	<0.050	<0.050
Potassium (K)-Total	1.120	1.100	0.050	RPD	1.8	0.220	0.200	0.050	<2XDL	OK	<0.10	<0.10
Selenium (Se)-Total	0.00069	0.00067	0.00010	RPD	2.9	<0.00010	<0.00010	0.00010	<DL	<DL	<0.00010	<0.00010
Silicon (Si)-Total	4.460	4.210	0.050	RPD	5.8	7.650	7.080	0.050	RPD	7.7	<0.050	<0.050
Silver (Ag)-Total	<0.000010	<0.000010	0.000010	<DL	<DL	<0.000010	<0.000010	0.000010	<DL	<DL	<0.000010	<0.000010
Sodium (Na)-Total	1.730	1.710	0.050	RPD	1.2	1.940	1.880	0.050	RPD	3.1	<0.050	<0.050
Strontium (Sr)-Total	0.12300	0.11500	0.00020	RPD	6.7	0.03040	0.02860	0.00020	RPD	6.1	<0.00020	<0.00020
Thallium (Tl)-Total	<0.000010	<0.000010	0.000010	<DL	<DL	<0.000010	<0.000010	0.000010	<DL	<DL	<0.000010	<0.000010
Tin (Sn)-Total	<0.00010	<0.00010	0.00010	<DL	<DL	<0.00010	<0.00010	0.00010	<DL	<DL	<0.00010	<0.00010
Titanium (Ti)-Total	<0.010	<0.010	0.010	<DL	<DL	<0.010	<0.010	0.010	<DL	<DL	<0.010	<0.010
Uranium (U)-Total	0.001730	0.001650	0.000010	RPD	4.7	0.000133	0.000132	0.000010	RPD	0.8	<0.000010	<0.000010
Vanadium (V)-Total	<0.0010	<0.0010	0.0010	<DL	<DL	<0.0010	<0.0010	0.0010	<DL	<DL	<0.0010	<0.0010
Zinc (Zn)-Total	<0.0030	<0.0030	0.0030	<DL	<DL	0.0038	0.0039	0.0030	<2XDL	OK	<0.0030	<0.0030



	R6	DUPLICATE #1 - R6	Detection Limit	QA/QC Category	Relative Percent Difference	FC	DUPLICATE #2 - FC	Detection Limit	QA/QC Category	Relative Percent Difference	FIELD	TRAVEL
Date Sampled	12-AUG-13	12-AUG-13	DL		% RPD	13-AUG-13	13-AUG-13	DL		% RPD	13-AUG-13	13-AUG-13
Time Sampled	17:00	17:05				10:30	10:30				16:30	00:00
Dissolved Metals												
Dissolved Metals Filtration Location	FIELD	FIELD				FIELD	FIELD					
Aluminum (Al)-Dissolved	0.0061	0.0052	0.0010	RPD	15.9	<0.00010	<0.00010	0.0010	<DL	<DL	<0.0010	-
Antimony (Sb)-Dissolved	0.00013	0.00013	0.00010	<2XDL	OK	0.00011	0.00010	0.00010	<2XDL	OK	<0.00010	-
Arsenic (As)-Dissolved	0.00041	0.00045	0.00010	<2XDL	OK	0.019000	0.019200	0.00010	RPD	-1.0	<0.00010	-
Barium (Ba)-Dissolved	0.070200	0.070600	0.000050	RPD	-0.6	<0.00010	<0.00010	0.000050	<DL	<DL	0.00006	-
Beryllium (Be)-Dissolved	<0.00010	<0.00010	0.00010	<DL	<DL	<0.00050	<0.00050	0.00010	<DL	<DL	<0.00010	-
Bismuth (Bi)-Dissolved	<0.00050	<0.00050	0.00050	<DL	<DL	<0.010	<0.010	0.00050	<DL	<DL	<0.00050	-
Boron (B)-Dissolved	<0.010	<0.010	0.010	<DL	<DL	0.000012	0.000010	0.010	<2XDL	<DL	<0.010	-
Cadmium (Cd)-Dissolved	0.000016	0.000013	0.000010	<2XDL	OK	4.620	4.610	0.000010	RPD	0.2	<0.000010	-
Calcium (Ca)-Dissolved	40.700	39.400	0.020	RPD	3.2	0.00012	0.00012	0.020	<2XDL	<DL	<0.050	-
Chromium (Cr)-Dissolved	<0.00010	<0.00010	0.00010	<DL	<DL	<0.00010	<0.00010	0.00010	<DL	<DL	<0.00010	-
Cobalt (Co)-Dissolved	<0.00010	<0.00010	0.00010	<DL	<DL	0.00062	0.00061	0.00010	RPD	1.6	<0.00010	-
Copper (Cu)-Dissolved	0.00050	0.00051	0.00020	<2XDL	OK	0.028	0.028	0.00020	RPD	0.0	<0.00020	-
Iron (Fe)-Dissolved	0.078	0.078	0.010	RPD	0.0	0.000760	0.000940	0.010	<2XDL	OK	<0.010	-
Lead (Pb)-Dissolved	<0.000050	<0.000050	0.000050	<DL	<DL	0.00081	0.00090	0.000050	RPD	<DL	<0.000050	-
Lithium (Li)-Dissolved	0.00062	0.00070	0.00050	<2XDL	OK	0.9300	0.9100	0.00050	RPD	2.2	<0.00050	-
Magnesium (Mg)-Dissolved	11.2000	10.7000	0.0050	RPD	4.6	0.002830	0.002850	0.0050	<2XDL	OK	<0.10	-
Manganese (Mn)-Dissolved	0.011700	0.012000	0.000050	RPD	-2.5	<0.000010	<0.000010	0.000050	<DL	<DL	<0.000050	-
Molybdenum (Mo)-Dissolved	0.001150	0.001120	0.000050	RPD	2.6	0.00006	<0.000050	0.000050	<DL	<DL	<0.000050	-
Nickel (Ni)-Dissolved	<0.00050	<0.00050	0.00050	<DL	<DL	<0.00050	<0.00050	0.00050	<DL	<DL	<0.00050	-
Phosphorus (P)-Dissolved	<0.050	<0.050	0.30	<DL	<DL	<0.050	<0.050	0.30	<DL	OK	<0.050	-
Potassium (K)-Dissolved	1.120	1.060	0.050	RPD	5.5	0.17000	0.16000	0.050	<2XDL	<DL	<0.10	-
Selenium (Se)-Dissolved	0.00080	0.00078	0.00010	RPD	2.5	<0.00010	<0.00010	0.00010	<DL	OK	<0.00010	-
Silicon (Si)-Dissolved	4.500	4.230	0.050	RPD	6.2	7.070000	6.950000	0.050	RPD	<DL	<0.050	-
Silver (Ag)-Dissolved	<0.000010	0.000043	0.000010	<DL	<DL	<0.000010	<0.000010	0.000010	<DL	OK	<0.000010	-
Sodium (Na)-Dissolved	1.700	1.730	0.050	RPD	-1.7	1.87000	1.90000	0.050	RPD	-1.6	0.170000	-
Strontium (Sr)-Dissolved	0.12300	0.11900	0.00020	RPD	3.3	0.028600	0.028400	0.00020	RPD	<DL	<0.50	-
Thallium (Tl)-Dissolved	<0.000010	<0.000010	0.000010	<DL	<DL	<0.000010	<0.000010	0.000010	<DL	<DL	<0.000010	-
Tin (Sn)-Dissolved	<0.00010	<0.00010	0.00010	<DL	<DL	<0.00010	<0.00010	0.00010	<DL	OK	<0.00010	-
Titanium (Ti)-Dissolved	<0.010	<0.010	0.010	<DL	<DL	<0.010	<0.010	0.010	<DL	<DL	<0.010	-
Uranium (U)-Dissolved	0.001690	0.001710	0.000010	RPD	-1.2	0.0001	0.0001	0.000010	RPD	-1.7	<0.000010	-
Vanadium (V)-Dissolved	<0.0010	<0.0010	0.0010	<DL	<DL	<0.0010	<0.0010	0.0010	<DL	OK	<0.0010	-
Zinc (Zn)-Dissolved	<0.0010	0.0011	0.0010	<DL	<DL	0.0033	0.0028	0.0010	<2XDL	OK	<0.0010	-



**APPENDIX E ALS CERTIFICATE OF ANALYSIS,
AUGUST 12-13, 2013**

This page is intentionally blank.



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

Date Received: 14-AUG-13
Report Date: 28-AUG-13 13:17 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1347802
Project P.O. #: NOT SUBMITTED
Job Reference: 13-Y-0199 FARO SWQ
C of C Numbers: 10-266527, 10-266549, 10-266550, 10-266556
Legal Site Desc:

Comments:

Can Dang
Senior Account Manager

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

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L1347802-1 Water 13-AUG-13 16:30 FIELD BLANK	L1347802-2 Water 13-AUG-13 16:20 V8	L1347802-3 Water 13-AUG-13 15:20 VW3	L1347802-4 Water 13-AUG-13 16:57 VGMMAIN	L1347802-5 Water 13-AUG-13 TRAVEL BLANK	
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	<2.0	830	157	972	<2.0
	Hardness (as CaCO3) (mg/L)	<0.50	472	72.2	606	<0.50
	pH (pH)	5.93	8.31	7.87	8.23	5.87
	Total Suspended Solids (mg/L)	<1.0	6.4	<1.0	<1.0	<1.0
	Total Dissolved Solids (mg/L)	<3.0	699	107	854	<3.0
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<1.0	128	50.9	98.1	<1.0
	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)	<1.0	128	50.9	98.1	<1.0
	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Chloride (Cl) (mg/L)	<0.50	<5.0 ^{DLA}	<0.50	<5.0 ^{DLA}	<0.50
	Fluoride (F) (mg/L)	<0.020	0.21	0.082	<0.20 ^{DLA}	<0.020
	Nitrate (as N) (mg/L)	<0.0050	0.140 ^{DLA}	0.0431	0.191 ^{DLA}	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.010 ^{DLA}	<0.0010	<0.010 ^{DLA}	<0.0010
	Phosphorus (P)-Total (mg/L)	<0.0020	0.0077	0.0034	<0.0020	<0.0020
Sulfate (SO4) (mg/L)	<0.50	375	25.5	504	<0.50	
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	<0.50	2.77	3.73	2.24	
	Total Organic Carbon (mg/L)	<0.50	2.84	3.60	2.15	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	<0.0030	0.229	0.0349	0.0140	<0.0030
	Antimony (Sb)-Total (mg/L)	<0.00010	0.00012	<0.00010	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	<0.00010	0.00064	0.00075	0.00037	<0.00010
	Barium (Ba)-Total (mg/L)	<0.000050	0.0919	0.0311	0.0917	<0.000050
	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	0.000159	0.000041	0.000208	<0.000010
	Calcium (Ca)-Total (mg/L)	<0.050	123	21.1	162	<0.050
	Chromium (Cr)-Total (mg/L)	<0.00010	0.00064	0.00014	0.00015	<0.00010
	Cobalt (Co)-Total (mg/L)	<0.00010	0.00021	<0.00010	<0.00010	<0.00010
	Copper (Cu)-Total (mg/L)	<0.00050	0.00109	0.00073	0.00096	<0.00050
	Iron (Fe)-Total (mg/L)	<0.010	0.327	0.092	0.042	<0.010
	Lead (Pb)-Total (mg/L)	<0.000050	0.000359	0.000154	0.000145	<0.000050
	Lithium (Li)-Total (mg/L)	<0.00050	0.00863	<0.00050	0.00978	<0.00050
	Magnesium (Mg)-Total (mg/L)	<0.10	38.2	4.97	43.3	<0.10
	Manganese (Mn)-Total (mg/L)	<0.000050	0.105	0.00583	0.161	<0.000050
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1347802-6 Water 13-AUG-13 16:36 R5	L1347802-7 Water 13-AUG-13 09:56 USFR	L1347802-8 Water 13-AUG-13 12:30 R1	L1347802-9 Water 13-AUG-13 15:40 VW1	L1347802-10 Water 13-AUG-13 16:04 VW2
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	278	58.0	191	320	609
	Hardness (as CaCO3) (mg/L)	143	25.3	94.8	174	394
	pH (pH)	8.33	7.56	8.17	8.28	8.38
	Total Suspended Solids (mg/L)	<1.0	2.8	<1.0	39.6	4.4
	Total Dissolved Solids (mg/L)	169	43.1	122	202	446
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	121	25.0	86.3	127	285
	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)	121	25.0	86.3	127	285
	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	0.88	<0.50
	Fluoride (F) (mg/L)	0.088	0.068	0.118	0.176	0.170
	Nitrate (as N) (mg/L)	0.0317	<0.0050	0.0200	0.0137	0.116
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	0.0017	<0.0010
	Phosphorus (P)-Total (mg/L)	0.0025	0.0050	0.0040	0.0312	0.0251
	Sulfate (SO4) (mg/L)	32.9	5.16	16.8	41.1	89.5
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	2.49	2.86	3.08	4.21	2.87
	Total Organic Carbon (mg/L)	2.36	2.87	3.03	4.57	2.51
Total Metals	Aluminum (Al)-Total (mg/L)	0.0226	0.0665	0.0138	1.17	0.0957
	Antimony (Sb)-Total (mg/L)	0.00012	<0.00010	<0.00010	0.00015	0.00024
	Arsenic (As)-Total (mg/L)	0.00046	0.00039	0.00047	0.00171	0.00049
	Barium (Ba)-Total (mg/L)	0.0637	0.0295	0.0467	0.0843	0.118
	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)	0.000015	<0.000010	<0.000010	0.000052	0.000127
	Calcium (Ca)-Total (mg/L)	39.3	8.23	28.8	42.2	90.3
	Chromium (Cr)-Total (mg/L)	0.00022	0.00019	0.00014	0.00275	0.00049
	Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010	<0.00010	0.00073	<0.00010
	Copper (Cu)-Total (mg/L)	0.00071	0.00051	0.00084	0.00324	0.00132
	Iron (Fe)-Total (mg/L)	0.182	0.208	0.261	1.60	0.156
	Lead (Pb)-Total (mg/L)	0.000074	0.000144	<0.000050	0.00143	0.000345
	Lithium (Li)-Total (mg/L)	0.00103	<0.00050	0.00071	0.00359	0.00241
	Magnesium (Mg)-Total (mg/L)	10.2	1.31	5.59	15.1	35.5
	Manganese (Mn)-Total (mg/L)	0.111	0.0166	0.0261	0.0662	0.00283
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1347802-11 Water 13-AUG-13 15:06 GCULV	L1347802-12 Water 13-AUG-13 09:38 VR	L1347802-13 Water 13-AUG-13 09:22 V17A	L1347802-14 Water 13-AUG-13 12:55 NW1D	L1347802-15 Water 13-AUG-13 11:35 W1O
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	61.1	64.4	168	2230	118
	Hardness (as CaCO3) (mg/L)	26.9	28.8	80.5	1530	58.1
	pH (pH)	7.74	7.49	7.74	7.74	7.92
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	35.5	<1.0
	Total Dissolved Solids (mg/L)	45.1	53.0	117	2430	85.2
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	27.0	27.6	45.6	160	60.4
	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)	27.0	27.6	45.6	160	60.4
	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050	0.0100	0.0214	<0.0050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<10 ^{DLA}	<0.50
	Fluoride (F) (mg/L)	0.072	0.070	0.079	<0.40 ^{DLA}	0.097
	Nitrate (as N) (mg/L)	0.0088	<0.0050	0.0928	0.41 ^{DLA}	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	0.0016	<0.020 ^{DLA}	<0.0010
	Phosphorus (P)-Total (mg/L)	0.0043	0.0026	0.0038	0.0094	0.0021
	Sulfate (SO4) (mg/L)	5.33	5.00	36.2	1490	3.00
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	2.60	3.56	3.92	3.28	3.90
	Total Organic Carbon (mg/L)	2.66	3.64	4.01	3.77	3.63
Total Metals	Aluminum (Al)-Total (mg/L)	0.0249	0.0358	0.0402	0.754 ^{DLA}	0.0222
	Antimony (Sb)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00050 ^{DLA}	<0.00010
	Arsenic (As)-Total (mg/L)	0.00042	0.00024	0.00123	0.00308	0.00015
	Barium (Ba)-Total (mg/L)	0.0288	0.0287	0.0230	0.0636 ^{DLA}	0.0191
	Beryllium (Be)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00050 ^{DLA}	<0.00010
	Bismuth (Bi)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.0025 ^{DLA}	<0.00050
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.050 ^{DLA}	<0.010
	Cadmium (Cd)-Total (mg/L)	<0.000010	0.000011	0.000014	0.0211	0.000023
	Calcium (Ca)-Total (mg/L)	8.85	9.31	21.5	275	18.9
	Chromium (Cr)-Total (mg/L)	0.00013	0.00013	0.00013	0.00091	0.00017
	Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010	<0.00010	0.0181	<0.00010
	Copper (Cu)-Total (mg/L)	<0.00050	0.00063	0.00075	0.0298	0.00208
	Iron (Fe)-Total (mg/L)	0.137	0.026	0.201	5.42	0.019
	Lead (Pb)-Total (mg/L)	<0.000050	<0.000050	0.000120	0.107	0.000078
	Lithium (Li)-Total (mg/L)	<0.00050	<0.00050	<0.00050	0.0232	<0.00050
	Magnesium (Mg)-Total (mg/L)	1.42	1.76	6.05	207	2.49
	Manganese (Mn)-Total (mg/L)	0.00657	0.000809	0.0212	2.40	0.000319
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	0.000055	<0.000010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1347802-16 Water 12-AUG-13 17:05 DUPLICATE #1	L1347802-17 Water 13-AUG-13 10:30 DUPLICATE #2	L1347802-18 Water 12-AUG-13 19:30 P1	L1347802-19 Water 13-AUG-13 12:00 X14	L1347802-20 Water 12-AUG-13 19:08 V20A
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	268	36.4	330	320	389
	Hardness (as CaCO3) (mg/L)	142	15.2	178	169	222
	pH (pH)	8.28	7.51	8.35	8.12	7.84
	Total Suspended Solids (mg/L)	<1.0	2.9	3.4	<1.0	<1.0
	Total Dissolved Solids (mg/L)	168	41.0	223	201	236
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	131	17.4	115	112	223
	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)	131	17.4	115	112	223
	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050	<0.0050	0.0188	<0.0050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.071	0.083	0.132	0.117	0.164
	Nitrate (as N) (mg/L)	0.0288	<0.0050	0.0065	0.0252	0.0052
	Nitrite (as N) (mg/L)	0.0011	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)	0.0035	0.0058	0.0056	<0.0020	0.0021
	Sulfate (SO4) (mg/L)	21.5	1.61	66.8	64.0	6.93
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	2.66	3.21	2.94	2.90	4.49
	Total Organic Carbon (mg/L)	2.48	2.96	2.91	2.79	4.45
Total Metals	Aluminum (Al)-Total (mg/L)	0.0235	0.118	0.0666	0.0177	<0.0030
	Antimony (Sb)-Total (mg/L)	0.00013	<0.00010	0.00022	<0.00010	<0.00010
	Arsenic (As)-Total (mg/L)	0.00047	0.00016	0.00065	0.00057	0.00061
	Barium (Ba)-Total (mg/L)	0.0685	0.0207	0.0782	0.0558	0.0952
	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)	0.000018	0.000013	0.000086	0.000026	<0.000010
	Calcium (Ca)-Total (mg/L)	38.9	4.64	44.5	47.2	58.9
	Chromium (Cr)-Total (mg/L)	0.00019	0.00028	0.00022	0.00017	0.00012
	Cobalt (Co)-Total (mg/L)	<0.00010	<0.00010	<0.00010	0.00069	<0.00010
	Copper (Cu)-Total (mg/L)	0.00059	0.00091	0.00085	0.00068	<0.00050
	Iron (Fe)-Total (mg/L)	0.136	0.142	0.116	0.503	0.024
	Lead (Pb)-Total (mg/L)	<0.000050	0.00344	0.000066	0.000350	<0.000050
	Lithium (Li)-Total (mg/L)	0.00078	0.00117	0.00251	0.00292	0.00279
	Magnesium (Mg)-Total (mg/L)	10.8	0.95	16.2	11.2	18.4
	Manganese (Mn)-Total (mg/L)	0.0146	0.00499	0.00924	0.912	0.0124
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1347802-21	L1347802-22	L1347802-23	L1347802-24	L1347802-25
	Description	Water	Water	Water	Water	Water
	Sampled Date	12-AUG-13	12-AUG-13	13-AUG-13	13-AUG-13	12-AUG-13
	Sampled Time	17:00	17:00	10:30	13:20	16:00
	Client ID	R4	R6	FC	K8	A1
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	287	270	37.4	130	267
	Hardness (as CaCO3) (mg/L)	147	148	15.4	64.1	143
	pH (pH)	8.25	8.29	7.55	8.01	8.38
	Total Suspended Solids (mg/L)	<1.0	<1.0	<1.0	<2.0 ^{DLIS}	41.7
	Total Dissolved Solids (mg/L)	185	163	37.8	86.3	172
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	109	130	17.3	55.5	114
	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)	109	130	17.3	55.5	114
	Ammonia, Total (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.109	0.071	0.082	0.101	0.095
	Nitrate (as N) (mg/L)	0.0361	0.0311	<0.0050	0.0351	0.0117
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Phosphorus (P)-Total (mg/L)	<0.0020	0.0030	0.0036	<0.0020	0.0587
Sulfate (SO4) (mg/L)	49.2	21.5	1.60	12.1	33.2	
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	2.58	2.33	2.93	2.18	2.71
	Total Organic Carbon (mg/L)	2.51	2.12	2.71	2.04	3.23
Total Metals	Aluminum (Al)-Total (mg/L)	0.0117	0.0247	0.0910	0.0105	1.22
	Antimony (Sb)-Total (mg/L)	0.00012	0.00015	<0.00010	<0.00010	0.00031
	Arsenic (As)-Total (mg/L)	0.00037	0.00048	0.00017	0.00023	0.00176
	Barium (Ba)-Total (mg/L)	0.0595	0.0713	0.0207	0.0312	0.103
	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)	0.000016	0.000019	0.000013	0.000010	0.000098
	Calcium (Ca)-Total (mg/L)	43.0	40.5	4.93	21.1	39.3
	Chromium (Cr)-Total (mg/L)	0.00020	0.00017	0.00025	0.00012	0.00247
	Cobalt (Co)-Total (mg/L)	0.00016	<0.00010	<0.00010	<0.00010	0.00072
	Copper (Cu)-Total (mg/L)	0.00082	0.00063	0.00088	0.00055	0.00354
	Iron (Fe)-Total (mg/L)	0.200	0.145	0.109	0.011	1.79
	Lead (Pb)-Total (mg/L)	0.000160	<0.000050	0.00182	0.000069	0.00128
	Lithium (Li)-Total (mg/L)	0.00219	0.00083	0.00106	0.00081	0.00214
	Magnesium (Mg)-Total (mg/L)	9.88	11.1	1.02	2.89	9.92
	Manganese (Mn)-Total (mg/L)	0.252	0.0151	0.00415	0.000491	0.0671
	Mercury (Hg)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID				
	L1347802-26 Water 12-AUG-13 15:40 P4				
Grouping	Analyte				
WATER					
Physical Tests	Conductivity (uS/cm)	343			
	Hardness (as CaCO3) (mg/L)	190			
	pH (pH)	8.33			
	Total Suspended Solids (mg/L)	5.1			
	Total Dissolved Solids (mg/L)	226			
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	114			
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0			
	Alkalinity, Total (as CaCO3) (mg/L)	114			
	Ammonia, Total (as N) (mg/L)	<0.0050			
	Chloride (Cl) (mg/L)	<0.50			
	Fluoride (F) (mg/L)	0.133			
	Nitrate (as N) (mg/L)	0.0053			
	Nitrite (as N) (mg/L)	<0.0010			
	Phosphorus (P)-Total (mg/L)	0.0089			
Sulfate (SO4) (mg/L)	67.7				
Organic / Inorganic Carbon	Dissolved Organic Carbon (mg/L)	2.85			
	Total Organic Carbon (mg/L)	2.89			
Total Metals	Aluminum (Al)-Total (mg/L)	0.0858			
	Antimony (Sb)-Total (mg/L)	0.00022			
	Arsenic (As)-Total (mg/L)	0.00065			
	Barium (Ba)-Total (mg/L)	0.0781			
	Beryllium (Be)-Total (mg/L)	<0.00010			
	Bismuth (Bi)-Total (mg/L)	<0.00050			
	Boron (B)-Total (mg/L)	<0.010			
	Cadmium (Cd)-Total (mg/L)	0.000084			
	Calcium (Ca)-Total (mg/L)	44.6			
	Chromium (Cr)-Total (mg/L)	0.00031			
	Cobalt (Co)-Total (mg/L)	<0.00010			
	Copper (Cu)-Total (mg/L)	0.00115			
	Iron (Fe)-Total (mg/L)	0.166			
	Lead (Pb)-Total (mg/L)	0.000276			
	Lithium (Li)-Total (mg/L)	0.00176			
	Magnesium (Mg)-Total (mg/L)	16.5			
	Manganese (Mn)-Total (mg/L)	0.0147			
	Mercury (Hg)-Total (mg/L)	<0.000010			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1347802-1	L1347802-2	L1347802-3	L1347802-4	L1347802-5
		Description	Water	Water	Water	Water	Water
		Sampled Date	13-AUG-13	13-AUG-13	13-AUG-13	13-AUG-13	13-AUG-13
		Sampled Time	16:30	16:20	15:20	16:57	
		Client ID	FIELD BLANK	V8	VW3	VGMAIN	TRAVEL BLANK
Grouping	Analyte						
WATER							
Total Metals	Molybdenum (Mo)-Total (mg/L)		<0.000050	0.000803	0.000611	0.000521	<0.000050
	Nickel (Ni)-Total (mg/L)		<0.00050	0.00175	<0.00050	0.00100	<0.00050
	Phosphorus (P)-Total (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)		<0.10	1.35	0.38	1.40	<0.10
	Selenium (Se)-Total (mg/L)		<0.00010	0.00093	<0.00010	0.00038	<0.00010
	Silicon (Si)-Total (mg/L)		<0.050	4.46	4.95	3.70	<0.050
	Silver (Ag)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)		<0.050	3.34	1.67	3.24	<0.050
	Strontium (Sr)-Total (mg/L)		<0.00020	0.491	0.103	0.564	<0.00020
	Sulfur (S)-Total (mg/L)		<0.50	117	8.24	159	<0.50
	Thallium (Tl)-Total (mg/L)		<0.000010	0.000065	<0.000010	0.000094	<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)		<0.000010	0.00360	0.00126	0.00323	<0.000010
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)		<0.0030	0.0247	0.0167	0.0326	<0.0030
Dissolved Metals	Dissolved Metals Filtration Location		FIELD	FIELD	FIELD	FIELD	
	Aluminum (Al)-Dissolved (mg/L)		<0.0010	0.0044	0.0190	0.0055	
	Antimony (Sb)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	
	Arsenic (As)-Dissolved (mg/L)		<0.00010	0.00046	0.00074	0.00033	
	Barium (Ba)-Dissolved (mg/L)		0.000061 ^{RRV}	0.0883	0.0310	0.0938	
	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	0.000151	0.000028	0.000217	
	Calcium (Ca)-Dissolved (mg/L)		<0.050	125	21.0	168	
	Chromium (Cr)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	
	Cobalt (Co)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	
	Copper (Cu)-Dissolved (mg/L)		<0.00020	0.00070	0.00060	0.00063	
	Iron (Fe)-Dissolved (mg/L)		<0.010	<0.010	0.068	<0.010	
	Lead (Pb)-Dissolved (mg/L)		<0.000050	<0.000050	0.000051	<0.000050	
	Lithium (Li)-Dissolved (mg/L)		<0.00050	0.00813	<0.00050	0.0102	
	Magnesium (Mg)-Dissolved (mg/L)		<0.10	39.0	4.83	45.5	
	Manganese (Mn)-Dissolved (mg/L)		<0.000050	0.0968	0.00530	0.161	
	Mercury (Hg)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	
	Molybdenum (Mo)-Dissolved (mg/L)		<0.000050	0.000756	0.000101	0.000497	
	Nickel (Ni)-Dissolved (mg/L)		<0.00050	0.00125	<0.00050	0.00094	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1347802-6	L1347802-7	L1347802-8	L1347802-9	L1347802-10
		Description	Water	Water	Water	Water	Water
		Sampled Date	13-AUG-13	13-AUG-13	13-AUG-13	13-AUG-13	13-AUG-13
		Sampled Time	16:36	09:56	12:30	15:40	16:04
		Client ID	R5	USFR	R1	VW1	VW2
Grouping	Analyte						
WATER							
Total Metals	Molybdenum (Mo)-Total (mg/L)		0.000972	0.000298	0.000281	0.000693	0.00266
	Nickel (Ni)-Total (mg/L)		0.00074	<0.00050	<0.00050	0.00378	0.00147
	Phosphorus (P)-Total (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)		1.11	0.34	0.93	1.10	1.04
	Selenium (Se)-Total (mg/L)		0.00057	<0.00010	0.00017	0.00025	0.00347
	Silicon (Si)-Total (mg/L)		4.31	3.18	4.16	6.94	4.23
	Silver (Ag)-Total (mg/L)		<0.000010	<0.000010	<0.000010	0.000015	0.000014
	Sodium (Na)-Total (mg/L)		2.04	1.49	2.04	3.00	2.37
	Strontium (Sr)-Total (mg/L)		0.137	0.0513	0.158	0.209	0.320
	Sulfur (S)-Total (mg/L)		10.6	1.79	5.56	13.4	28.7
	Thallium (Tl)-Total (mg/L)		<0.000010	<0.000010	<0.000010	0.000015	<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	0.030	<0.010
	Uranium (U)-Total (mg/L)		0.00152	0.000438	0.00152	0.00219	0.00633
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010	<0.0010	0.0029	0.0020
	Zinc (Zn)-Total (mg/L)		0.0050	<0.0030	<0.0030	0.0116	0.0082
Dissolved Metals	Dissolved Metals Filtration Location		FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)		0.0058	0.0089	0.0051	0.0070	0.0011
	Antimony (Sb)-Dissolved (mg/L)		0.00012	<0.00010	<0.00010	<0.00010	0.00022
	Arsenic (As)-Dissolved (mg/L)		0.00039	0.00031	0.00042	0.00087	0.00036
	Barium (Ba)-Dissolved (mg/L)		0.0656	0.0278	0.0474	0.0623	0.120
	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)		0.000016	<0.000010	<0.000010	0.000011	0.000102
	Calcium (Ca)-Dissolved (mg/L)		40.1	8.09	29.0	44.9	94.4
	Chromium (Cr)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	0.00015
	Cobalt (Co)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Copper (Cu)-Dissolved (mg/L)		0.00055	0.00039	0.00049	0.00077	0.00049
	Iron (Fe)-Dissolved (mg/L)		0.100	0.083	0.181	0.054	<0.010
	Lead (Pb)-Dissolved (mg/L)		<0.000050	<0.000050	<0.000050	0.000056	<0.000050
	Lithium (Li)-Dissolved (mg/L)		0.00121	<0.00050	0.00083	0.00209	0.00256
	Magnesium (Mg)-Dissolved (mg/L)		10.3	1.24	5.47	15.2	38.4
	Manganese (Mn)-Dissolved (mg/L)		0.104	0.00373	0.0241	0.0404	<0.000050
	Mercury (Hg)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)		0.000914	0.000294	0.000275	0.000619	0.00263
	Nickel (Ni)-Dissolved (mg/L)		0.00060	<0.00050	<0.00050	0.00062	0.00101

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1347802-11	L1347802-12	L1347802-13	L1347802-14	L1347802-15
		Description	Water	Water	Water	Water	Water
		Sampled Date	13-AUG-13	13-AUG-13	13-AUG-13	13-AUG-13	13-AUG-13
		Sampled Time	15:06	09:38	09:22	12:55	11:35
		Client ID	GCULV	VR	V17A	NW1D	W10
Grouping	Analyte						
WATER							
Total Metals	Molybdenum (Mo)-Total (mg/L)	0.000286	0.000103	0.000074	0.00030	0.000198	
	Nickel (Ni)-Total (mg/L)	<0.00050	<0.00050	<0.00050	0.0900	<0.00050	
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050	
	Potassium (K)-Total (mg/L)	0.35	0.36	0.32	6.24	0.54	
	Selenium (Se)-Total (mg/L)	<0.00010	<0.00010	<0.00010	0.00055	<0.00010	
	Silicon (Si)-Total (mg/L)	3.29	5.10	5.51	7.05	6.97	
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	0.000124	<0.000010	
	Sodium (Na)-Total (mg/L)	1.54	1.58	1.76	15.9	2.01	
	Strontium (Sr)-Total (mg/L)	0.0534	0.0500	0.0941	1.52	0.0671	
	Sulfur (S)-Total (mg/L)	1.89	1.79	12.3	489	1.14	
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	0.000315	<0.000010	
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00050 ^{DLA}	<0.00010	
	Titanium (Ti)-Total (mg/L)	<0.010	<0.010	<0.010	<0.050 ^{DLA}	<0.010	
	Uranium (U)-Total (mg/L)	0.000472	0.000386	0.00112	0.00289	0.000135	
	Vanadium (V)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0050 ^{DLA}	<0.0010	
	Zinc (Zn)-Total (mg/L)	<0.0030	<0.0030	0.0248	30.0	0.0038	
Dissolved Metals	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD	
	Aluminum (Al)-Dissolved (mg/L)	0.0111	0.0234	0.0263	0.0156 ^{DLA}	0.0089	
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00050 ^{DLA}	<0.00010	
	Arsenic (As)-Dissolved (mg/L)	0.00038	0.00021	0.00114	<0.00050 ^{DLA}	0.00014	
	Barium (Ba)-Dissolved (mg/L)	0.0311	0.0282	0.0226	0.0329 ^{DLA}	0.0189	
	Beryllium (Be)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00050 ^{DLA}	<0.00010	
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.0025 ^{DLA}	<0.00050	
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.050 ^{DLA}	<0.010	
	Cadmium (Cd)-Dissolved (mg/L)	<0.000010	0.000013	0.000013	0.0194	0.000022	
	Calcium (Ca)-Dissolved (mg/L)	8.55	8.86	22.2	275 ^{DLA}	19.2	
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00050 ^{DLA}	<0.00010	
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	0.0177	<0.00010	
	Copper (Cu)-Dissolved (mg/L)	0.00039	0.00056	0.00060	0.0050	0.00102	
	Iron (Fe)-Dissolved (mg/L)	0.085	0.013	0.158	0.970	<0.010	
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	0.00305	<0.000050	
	Lithium (Li)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	0.0226	<0.00050	
	Magnesium (Mg)-Dissolved (mg/L)	1.35	1.63	6.11	206	2.48	
	Manganese (Mn)-Dissolved (mg/L)	0.00232	0.000403	0.0202	2.33	0.000099	
	Mercury (Hg)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
	Molybdenum (Mo)-Dissolved (mg/L)	0.000288	0.000093	0.000080	0.00026	0.000185	
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	0.0868	<0.00050	

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1347802-16	L1347802-17	L1347802-18	L1347802-19	L1347802-20
		Description	Water	Water	Water	Water	Water
		Sampled Date	12-AUG-13	13-AUG-13	12-AUG-13	13-AUG-13	12-AUG-13
		Sampled Time	17:05	10:30	19:30	12:00	19:08
		Client ID	DUPLICATE #1	DUPLICATE #2	P1	X14	V20A
Grouping	Analyte						
WATER							
Total Metals	Molybdenum (Mo)-Total (mg/L)		0.00119	0.000063	0.00129	0.000610	0.000184
	Nickel (Ni)-Total (mg/L)		<0.00050	<0.00050	0.00221	0.00195	<0.00050
	Phosphorus (P)-Total (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)		1.10	0.20	0.83	1.07	0.49
	Selenium (Se)-Total (mg/L)		0.00067	<0.00010	0.00109	0.00027	0.00024
	Silicon (Si)-Total (mg/L)		4.21	7.08	2.99	4.61	5.73
	Silver (Ag)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)		1.71	1.88	1.71	3.04	2.38
	Strontium (Sr)-Total (mg/L)		0.115	0.0286	0.198	0.187	0.318
	Sulfur (S)-Total (mg/L)		6.99	0.59	21.2	20.7	2.49
	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)		0.00165	0.000132	0.00173	0.00161	0.000784
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total (mg/L)		<0.0030	0.0039	0.0054	0.0286	0.0069
Dissolved Metals	Dissolved Metals Filtration Location		FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)		0.0052	0.0270	0.0119	0.0047	0.0017
	Antimony (Sb)-Dissolved (mg/L)		0.00013	<0.00010	0.00020	<0.00010	<0.00010
	Arsenic (As)-Dissolved (mg/L)		0.00045	0.00010	0.00055	0.00050	0.00057
	Barium (Ba)-Dissolved (mg/L)		0.0706	0.0192	0.0767	0.0564	0.0942
	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)		0.000013	0.000010	0.000070	0.000027	<0.000010
	Calcium (Ca)-Dissolved (mg/L)		39.4	4.61	44.8	48.6	59.0
	Chromium (Cr)-Dissolved (mg/L)		<0.00010	0.00012	<0.00010	<0.00010	<0.00010
	Cobalt (Co)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	0.00067	<0.00010
	Copper (Cu)-Dissolved (mg/L)		0.00051	0.00061	0.00066	0.00053	0.00029
	Iron (Fe)-Dissolved (mg/L)		0.078	0.028	0.012	0.356	0.019
	Lead (Pb)-Dissolved (mg/L)		<0.000050	0.000940	<0.000050	0.000138	<0.000050
	Lithium (Li)-Dissolved (mg/L)		0.00070	0.00090	0.00245	0.00277	0.00288
	Magnesium (Mg)-Dissolved (mg/L)		10.7	0.91	16.0	11.4	18.0
	Manganese (Mn)-Dissolved (mg/L)		0.0120	0.00285	0.00404	0.899	0.0112
	Mercury (Hg)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)		0.00112	<0.000050	0.00129	0.000569	0.000168
	Nickel (Ni)-Dissolved (mg/L)		<0.00050	<0.00050	0.00202	0.00191	<0.00050

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1347802-21	L1347802-22	L1347802-23	L1347802-24	L1347802-25
		Description	Water	Water	Water	Water	Water
		Sampled Date	12-AUG-13	12-AUG-13	13-AUG-13	13-AUG-13	12-AUG-13
		Sampled Time	17:00	17:00	10:30	13:20	16:00
		Client ID	R4	R6	FC	K8	A1
Grouping	Analyte						
WATER							
Total Metals	Molybdenum (Mo)-Total (mg/L)		0.000643	0.00120	0.000062	0.000127	0.00116
	Nickel (Ni)-Total (mg/L)		0.00105	<0.00050	<0.00050	<0.00050	0.00331
	Phosphorus (P)-Total (mg/L)		<0.050	<0.050	<0.050	<0.050	0.055
	Potassium (K)-Total (mg/L)		1.14	1.12	0.22	0.64	1.77
	Selenium (Se)-Total (mg/L)		0.00047	0.00069	<0.00010	<0.00010	0.00064
	Silicon (Si)-Total (mg/L)		4.57	4.46	7.65	5.25	7.75
	Silver (Ag)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	0.000034
	Sodium (Na)-Total (mg/L)		2.66	1.73	1.94	1.98	2.08
	Strontium (Sr)-Total (mg/L)		0.173	0.123	0.0304	0.139	0.144
	Sulfur (S)-Total (mg/L)		16.1	7.21	0.63	4.07	10.7
	Thallium (Tl)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	0.000029
	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	0.037
	Uranium (U)-Total (mg/L)		0.00138	0.00173	0.000133	0.00187	0.00172
	Vanadium (V)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	0.0055
	Zinc (Zn)-Total (mg/L)		0.0099	<0.0030	0.0038	<0.0030	0.0137
Dissolved Metals	Dissolved Metals Filtration Location		FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)		0.0038	0.0061	0.0269	0.0058	0.0053
	Antimony (Sb)-Dissolved (mg/L)		0.00010	0.00013	<0.00010	<0.00010	0.00016
	Arsenic (As)-Dissolved (mg/L)		0.00032	0.00041	0.00011	0.00022	0.00066
	Barium (Ba)-Dissolved (mg/L)		0.0584	0.0702	0.0190	0.0309	0.0560
	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)		0.000016	0.000016	0.000012	<0.000010	<0.000010
	Calcium (Ca)-Dissolved (mg/L)		43.1	40.7	4.62	21.1	40.9
	Chromium (Cr)-Dissolved (mg/L)		0.00011	<0.00010	0.00012	<0.00010	<0.00010
	Cobalt (Co)-Dissolved (mg/L)		0.00013	<0.00010	<0.00010	<0.00010	<0.00010
	Copper (Cu)-Dissolved (mg/L)		0.00064	0.00050	0.00062	0.00044	0.00072
	Iron (Fe)-Dissolved (mg/L)		0.128	0.078	0.028	<0.010	0.017
	Lead (Pb)-Dissolved (mg/L)		0.000055	<0.000050	0.000760	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)		0.00198	0.00062	0.00081	0.00075	0.00111
	Magnesium (Mg)-Dissolved (mg/L)		9.64	11.2	0.93	2.81	9.84
	Manganese (Mn)-Dissolved (mg/L)		0.228	0.0117	0.00283	0.000241	0.0328
	Mercury (Hg)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Molybdenum (Mo)-Dissolved (mg/L)		0.000604	0.00115	0.000058	0.000107	0.000972
	Nickel (Ni)-Dissolved (mg/L)		0.00095	<0.00050	<0.00050	<0.00050	0.00067

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1347802-26				
Description	Water				
Sampled Date	12-AUG-13				
Sampled Time	15:40				
Client ID	P4				
Grouping	Analyte				
WATER					
Total Metals	Molybdenum (Mo)-Total (mg/L)	0.00140			
	Nickel (Ni)-Total (mg/L)	0.00233			
	Phosphorus (P)-Total (mg/L)	<0.050			
	Potassium (K)-Total (mg/L)	0.89			
	Selenium (Se)-Total (mg/L)	0.00099			
	Silicon (Si)-Total (mg/L)	3.03			
	Silver (Ag)-Total (mg/L)	<0.000010			
	Sodium (Na)-Total (mg/L)	1.70			
	Strontium (Sr)-Total (mg/L)	0.203			
	Sulfur (S)-Total (mg/L)	21.8			
	Thallium (Tl)-Total (mg/L)	<0.000010			
	Tin (Sn)-Total (mg/L)	0.00020			
	Titanium (Ti)-Total (mg/L)	<0.010			
	Uranium (U)-Total (mg/L)	0.00176			
	Vanadium (V)-Total (mg/L)	<0.0010			
	Zinc (Zn)-Total (mg/L)	0.0053			
Dissolved Metals	Dissolved Metals Filtration Location	FIELD			
	Aluminum (Al)-Dissolved (mg/L)	0.0105			
	Antimony (Sb)-Dissolved (mg/L)	0.00020			
	Arsenic (As)-Dissolved (mg/L)	0.00056			
	Barium (Ba)-Dissolved (mg/L)	0.0765			
	Beryllium (Be)-Dissolved (mg/L)	<0.00010			
	Bismuth (Bi)-Dissolved (mg/L)	<0.00050			
	Boron (B)-Dissolved (mg/L)	<0.010			
	Cadmium (Cd)-Dissolved (mg/L)	0.000059			
	Calcium (Ca)-Dissolved (mg/L)	47.7			
	Chromium (Cr)-Dissolved (mg/L)	<0.00010			
	Cobalt (Co)-Dissolved (mg/L)	<0.00010			
	Copper (Cu)-Dissolved (mg/L)	0.00069			
	Iron (Fe)-Dissolved (mg/L)	0.012			
	Lead (Pb)-Dissolved (mg/L)	<0.000050			
	Lithium (Li)-Dissolved (mg/L)	0.00172			
	Magnesium (Mg)-Dissolved (mg/L)	17.2			
	Manganese (Mn)-Dissolved (mg/L)	0.00679			
	Mercury (Hg)-Dissolved (mg/L)	<0.000010			
	Molybdenum (Mo)-Dissolved (mg/L)	0.00134			
	Nickel (Ni)-Dissolved (mg/L)	0.00189			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID	L1347802-1 Water 13-AUG-13 16:30 FIELD BLANK	L1347802-2 Water 13-AUG-13 16:20 V8	L1347802-3 Water 13-AUG-13 15:20 VW3	L1347802-4 Water 13-AUG-13 16:57 VGMMAIN	L1347802-5 Water 13-AUG-13 TRAVEL BLANK
Grouping	Analyte				
WATER					
Dissolved Metals	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	<0.10	1.27	0.34	1.37
	Selenium (Se)-Dissolved (mg/L)	<0.00010	0.00096	<0.00010	0.00041
	Silicon (Si)-Dissolved (mg/L)	<0.050	4.15	4.88	3.83
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	0.170	3.31	1.63	3.31
	Strontium (Sr)-Dissolved (mg/L)	<0.00020	0.491	0.0988	0.591
	Sulfur (S)-Dissolved (mg/L)	<0.50	117	8.21	161
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	0.000064	<0.000010	0.000098
	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)	<0.000010	0.00371	0.00128	0.00333
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	0.0199	0.0156	0.0315

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1347802-6 Water 13-AUG-13 16:36 R5	L1347802-7 Water 13-AUG-13 09:56 USFR	L1347802-8 Water 13-AUG-13 12:30 R1	L1347802-9 Water 13-AUG-13 15:40 VW1	L1347802-10 Water 13-AUG-13 16:04 VW2
Grouping	Analyte					
WATER						
Dissolved Metals	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	1.09	0.31	0.85	0.79	1.03
	Selenium (Se)-Dissolved (mg/L)	0.00063	<0.00010	0.00014	0.00024	0.00382
	Silicon (Si)-Dissolved (mg/L)	4.36	3.01	4.15	5.24	4.29
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	2.08	1.48	2.05	3.01	2.46
	Strontium (Sr)-Dissolved (mg/L)	0.136	0.0492	0.155	0.207	0.329
	Sulfur (S)-Dissolved (mg/L)	11.0	1.74	5.60	13.7	30.3
	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)	0.00149	0.000358	0.00146	0.00211	0.00648
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0038	<0.0010	0.0016	0.0032	0.0033

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	Description	Sampled Date	Sampled Time	Client ID	L1347802-16	L1347802-17	L1347802-18	L1347802-19	L1347802-20
					Water	Water	Water	Water	Water
		12-AUG-13	17:05		12-AUG-13	13-AUG-13	12-AUG-13	13-AUG-13	12-AUG-13
					17:05	10:30	19:30	12:00	19:08
					DUPLICATE #1	DUPLICATE #2	P1	X14	V20A
Grouping	Analyte								
WATER									
Dissolved Metals	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	1.06	0.16	0.79	1.05	0.46			
	Selenium (Se)-Dissolved (mg/L)	0.00078	<0.00010	0.00113	0.00027	0.00029			
	Silicon (Si)-Dissolved (mg/L)	4.23	6.95	2.86	4.75	5.75			
	Silver (Ag)-Dissolved (mg/L)	0.000043 ^{DTC}	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	1.73	1.90	1.75	3.02	2.34			
	Strontium (Sr)-Dissolved (mg/L)	0.119	0.0284	0.197	0.183	0.304			
	Sulfur (S)-Dissolved (mg/L)	7.05	0.60	21.6	21.1	2.44			
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<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	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Uranium (U)-Dissolved (mg/L)	0.00171	0.000120	0.00170	0.00160	0.000782			
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0011	0.0028	0.0034	0.0251	0.0060			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID	L1347802-21 Water 12-AUG-13 17:00 R4	L1347802-22 Water 12-AUG-13 17:00 R6	L1347802-23 Water 13-AUG-13 10:30 FC	L1347802-24 Water 13-AUG-13 13:20 K8	L1347802-25 Water 12-AUG-13 16:00 A1
Grouping	Analyte					
WATER						
Dissolved Metals	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	1.06	1.12	0.17	0.60	1.29
	Selenium (Se)-Dissolved (mg/L)	0.00049	0.00080	<0.00010	<0.00010	0.00061
	Silicon (Si)-Dissolved (mg/L)	4.54	4.50	7.07	5.20	4.57
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	2.54	1.70	1.87	1.96	2.12
	Strontium (Sr)-Dissolved (mg/L)	0.167	0.123	0.0286	0.135	0.145
	Sulfur (S)-Dissolved (mg/L)	16.2	7.18	0.59	4.08	11.0
	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)	0.00130	0.00169	0.000118	0.00184	0.00162
	Vanadium (V)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Dissolved (mg/L)	0.0074	<0.0010	0.0033	<0.0010	<0.0010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID Description Sampled Date Sampled Time Client ID				
	L1347802-26 Water 12-AUG-13 15:40 P4				
Grouping	Analyte				
WATER					
Dissolved Metals	Phosphorus (P)-Dissolved (mg/L)	<0.050			
	Potassium (K)-Dissolved (mg/L)	0.87			
	Selenium (Se)-Dissolved (mg/L)	0.00111			
	Silicon (Si)-Dissolved (mg/L)	3.06			
	Silver (Ag)-Dissolved (mg/L)	<0.000010			
	Sodium (Na)-Dissolved (mg/L)	1.71			
	Strontium (Sr)-Dissolved (mg/L)	0.213			
	Sulfur (S)-Dissolved (mg/L)	22.7			
	Thallium (Tl)-Dissolved (mg/L)	<0.000010			
	Tin (Sn)-Dissolved (mg/L)	<0.00010			
	Titanium (Ti)-Dissolved (mg/L)	<0.010			
	Uranium (U)-Dissolved (mg/L)	0.00179			
	Vanadium (V)-Dissolved (mg/L)	<0.0010			
	Zinc (Zn)-Dissolved (mg/L)	0.0015			

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Beryllium (Be)-Dissolved	DLA	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Duplicate	Bismuth (Bi)-Dissolved	DLA	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Duplicate	Selenium (Se)-Dissolved	DLA	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Duplicate	Silver (Ag)-Dissolved	DLA	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Duplicate	Thallium (Tl)-Dissolved	DLA	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Duplicate	Tin (Sn)-Dissolved	DLA	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Duplicate	Titanium (Ti)-Dissolved	DLA	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Duplicate	Vanadium (V)-Dissolved	DLA	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Duplicate	Arsenic (As)-Total	DLA	L1347802-10, -11, -12, -13, -14, -2, -3, -4, -6, -7, -8, -9
Duplicate	Beryllium (Be)-Total	DLA	L1347802-10, -11, -12, -13, -14, -2, -3, -4, -6, -7, -8, -9
Duplicate	Bismuth (Bi)-Total	DLA	L1347802-10, -11, -12, -13, -14, -2, -3, -4, -6, -7, -8, -9
Duplicate	Boron (B)-Total	DLA	L1347802-10, -11, -12, -13, -14, -2, -3, -4, -6, -7, -8, -9
Duplicate	Cobalt (Co)-Total	DLA	L1347802-10, -11, -12, -13, -14, -2, -3, -4, -6, -7, -8, -9
Duplicate	Copper (Cu)-Total	DLA	L1347802-10, -11, -12, -13, -14, -2, -3, -4, -6, -7, -8, -9
Duplicate	Silver (Ag)-Total	DLA	L1347802-10, -11, -12, -13, -14, -2, -3, -4, -6, -7, -8, -9
Duplicate	Tin (Sn)-Total	DLA	L1347802-10, -11, -12, -13, -14, -2, -3, -4, -6, -7, -8, -9
Duplicate	Titanium (Ti)-Total	DLA	L1347802-10, -11, -12, -13, -14, -2, -3, -4, -6, -7, -8, -9
Duplicate	Vanadium (V)-Total	DLA	L1347802-10, -11, -12, -13, -14, -2, -3, -4, -6, -7, -8, -9
Duplicate	Bismuth (Bi)-Total	DLA	L1347802-15, -16, -17, -18, -19, -20, -21, -22, -23, -24, -25, -26
Duplicate	Tin (Sn)-Total	DLA	L1347802-15, -16, -17, -18, -19, -20, -21, -22, -23, -24, -25, -26
Matrix Spike	Phosphorus (P)-Total	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Phosphorus (P)-Total	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfate (SO4)	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Total Organic Carbon	MS-B	L1347802-1, -2, -3, -4
Matrix Spike	Total Organic Carbon	MS-B	L1347802-15
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Boron (B)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	-2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9 L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1347802-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -23, -24, -25, -26, -3, -4, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit Adjusted For required dilution
DLIS	Detection Limit Adjusted: Insufficient Sample
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.
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-PCT-VA	Water	Alkalinity by Auto. 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.			
ALK-PCT-VA	Water	Alkalinity by Auto. 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.			
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,			

Reference Information

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
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-DIS-LOW-CVAFS-VA	Water	Dissolved Mercury in Water by CVAFS(Low)	EPA SW-846 3005A & EPA 245.7
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 filtration (EPA Method 3005A) and 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).			
HG-TOT-LOW-CVAFS-VA	Water	Total Mercury in Water by CVAFS(Low)	EPA 245.7
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).			
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-DIS-LOW-ICP-VA	Water	Dissolved Metals in Water by ICPOES	EPA 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
MET-T-CCMS-VA	Water	Total Metals in Water by CRC ICPMS	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-TOT-LOW-ICP-VA	Water	Total Metals in Water by ICPOES	EPA 3005A/6010B
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).			
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."			
S-DIS-ICP-VA	Water	Dissolved Sulfur in Water by ICPOES	EPA SW-846 3005A/6010B

Reference Information

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 - optical emission spectrophotometry (EPA Method 6010B).

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

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

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

Method Limitation: This method will not give total sulfur results for all samples. Sulfide or other volatile forms of sulfur that may be present in submitted samples, is often lost during the sampling, preservation and analysis process. The data reported as total and/or dissolved sulfur represents all non-volatile forms of sulfur present in a particular sample.

TDS-LOW-VA Water Low Level TDS (3.0mg/L) by Gravimetric APHA 2540 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-LOW-VA Water Total Suspended Solids by Grav. (1 mg/L) APHA 2540 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.

** 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:

10-266527 10-266549 10-266550 10-266556

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 / Analytical Request Form
 Canada Toll Free: 1 800 668 9878
 www.alsglobal.com

Report To	Report Format / Distribution	Service Request: (Rush subject to availability - Contact ALS to confirm TAT)
Company: <u>EDI</u>	Standard: Other (specify):	<input checked="" type="checkbox"/> Regular (Standard Turnaround Times - Business Days)
Contact: <u>Meghan Marjanovic</u>	Select: <u>PDF</u> Excel Digital Fax	Priority(2-4 Business Days)-50% surcharge - Contact ALS to confirm TAT
Address: <u>2195-2nd Ave</u> <u>Whitehorse, YT Y1A 3T8</u>	Email 1: <u>mmarjanovic@edynamics.com</u>	Emergency (1-2 Business Days)-100% Surcharge - Contact ALS to confirm TAT
Phone: <u>867-793-4882</u> Fax:	Email 2:	Same Day or Weekend Emergency - Contact ALS to confirm TAT

Invoice To Same as Report ? (circle) Yes or <u>No</u> (if No, provide details)	Client / Project Information	Analysis Request (Indicate Filtered or Preserved, F/P)																		
Copy of Invoice with Report? (circle) Yes or <u>No</u>	Job #: <u>17-4-0199 Faro SWCP</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Company: <u>EDI</u>	PO / AFE:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contact: <u>Shannon Jenner</u>	LSD:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Address: <u>2195-2nd Ave Whitehorse Y1A 3T8</u>	Quote #:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Phone: <u>867-793-4882</u> Fax:	ALS Contact:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Sampler: <u>MM, BSm.</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Sample #	Sample Ident (This description will appear on label)	Short Holding Time
		Rush Processing
	FIELD BLANK	Short Holding Time Rush Processing
	VB	
	VW3	
	VGMAIN	
	TRAVEL BANK	
	RS	
	WJFR	
	R1	

Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA	ANIONS-ALL-IC-WR	DOC/DKN/TPP/DWH3	TOC/CO2/TKN/TP/EBOD	TSS-VA-TDS-VA	PH-MAN-WR	EC-MAN-WR	MET-D-BOD-DG-A	MET-T-BOD-DG-VA	Number of Containers
13-Aug-13	16:30	WATER	X	X	X	X	X	X	X	X	X	5
12-Aug-12	16:20		X	X	X	X	X	X	X	X	X	5
13-Aug-13	15:20		X	X	X	X	X	X	X	X	X	5
13-Aug-13	16:57		X	X	X	X	X	X	X	X	X	5
12-Aug-13			X	X	X	X	X	X	X	X	X	5
13-Aug-13	16:36		X	X	X	X	X	X	X	X	X	5
12-Aug-13	09:56		X	X	X	X	X	X	X	X	X	5
13-Aug-13	12:30	↓	X	X	X	X	X	X	X	X	X	5



L1347802-COFC

[E- Freshwater Aquatic Life/BC CSR-Commercial/AB Tier 1-Natural/ETC) / Hazardous Details

* Please format data according to CH₂M Mill requirements *

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.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by: <u>M. Marjanovic</u>	Date: <u>Aug 14, 2013</u>	Time: <u>14:00</u>	Received by: <u>[Signature]</u>	Date: <u>14-Aug-13</u>	Time: <u>12:40</u>	Temperature: <u>0C</u>	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

GENF 18.01 Front

7.5C, 6.9C, 8.3C, 9.4C BP Aug 15 14:55 7.4

