

September 06, 2016

EDI Project No: 16Y0089

Assessment and Abandoned Mines Branch (AAM) K-419
Department of Energy, Mines and Resources, Yukon Government
Room 2C Royal Center, 4114-4th Avenue
PO 2703, Whitehorse, YT, Y1A 2C6

Attention: Emilie Hamm, A/Project Manager

RE: Mount Nansen Water Resources Investigations – Monthly Report: August 2016 - DRAFT

Trip dates:	August 1 - 3, 2016
EDI field staff:	Joel MacFabe and Devon O'Connor
Weather during trip:	Conditions ranged from clear skies to periods of rain. Air temperature ranged from 15 and 24°C.

This monthly report includes a summary of site conditions and data collected during EDI's August 2016 trip to Mount Nansen as part of the 2016/17 Water Resources Investigation. This report includes site conditions, meteorology, hydrology, water quality, program recommendations, and additional trip information (Table 1).

Table 1. Summary of information provided in this monthly report.

Report Section	Description
Site Conditions	<ul style="list-style-type: none"> • Summary of weather and general site conditions
Meteorology	<ul style="list-style-type: none"> • Statement on meteorological station status and identification of any data gaps or QA/QC issues
Hydrology	<ul style="list-style-type: none"> • Discussion of hydrology data for this month • Statement of QA/QC for the data collected this month
Water Quality	<ul style="list-style-type: none"> • Summary of water quality results for this month • Statement on QA/QC sample results for this month
Program Recommendations	<ul style="list-style-type: none"> • Program recommendations for meteorological, hydrology and water quality programs
Additional Trip Information	<ul style="list-style-type: none"> • Project safety concerns • Wildlife sightings • Budget and schedule considerations



Report Section	Description
List of Attachments	<ol style="list-style-type: none">1. Maps of Hydrometric Stations and Water Quality Sites2. Site and Station Photos (August 2016)3. Hydrology Summary Data Tables (August 2016)4. Water Quality Summary Data Tables (August 2016)5. Laboratory Certificates of Analysis (COA) & Yukon Environmental Health Services Bacteriological Results (August 2016).

SITE CONDITIONS

The August 2016 trip was reflective of mid-summer conditions. Water levels were higher at most sites and stations than during the July 2016 trip. The weather on August 1 was sunny with temperatures up to 20°C. August 2 was partly cloudy to overcast skies and temperatures up to 23°C. Periods of moderate rain occurred throughout the day on August 3 and temperatures reached 12°C. All watercourses were flowing, except for small seepage sites at WQ-DESS-03, WQ-LW-SEEP-01 and WQ-NW-SEEP-02. Placer mining construction works continue to operate along Pony Creek upstream of H-PC-DSP/WQ-PC-U.

METEOROLOGY

Meteorological data was collected at the ATM-ROAD station throughout August 2016. EDI conducted a QA/QC review of the August 2016 data and all sensors appear to be functioning properly. Meteorological data will be summarized and analyzed at the end of the open-water season, in the October 2016 Monthly Report.

HYDROLOGY

All hydrometric stations provided suitable conditions for discharge measurements during the August 2016 trip. A total of 12 discharges measurements were collected at the Mount Nansen site. Water levels were higher than during the July 2016 visit, with the exception of H-DC-M WP, H-DC-R and H-SEEP where August flowrates were lower than during the July 2016 visit. For the month of August, continuous logger records are available for the following seven stations: H-DC-B, H-DC-R, H-VC-U, H-BC, H-VC-DBC, H-VC-UMN and H-VC-R+290. A preliminary review of the continuous hydrometric and barometric data files indicates that all sensors are functioning properly.

Surface water conditions and hydrometric monitoring tasks completed at each station in August 2016 are summarized in Attachment 3. Quality control and quality assurance for the hydrometric data was conducted on both the instantaneous and continuous datasets.

Field Results

- Discharge measurements were collected with a Sontek Flowtracker acoustic Doppler velocimeter (ADV) using the velocity-area mid-section method at the four Victoria Creek stations: H-VC-U, H-VC-DBC, H-VC-UMN, and H-VC-R+290. August discharge values in



Victoria Creek ranged from 0.503 to 0.699 m³/s. The August discharges represent higher flow conditions than the July 4 – 6 trip.

- Flows increased in the downstream direction along Victoria Creek as the contributing watershed area increased. A description of the discharge patterns along Victoria Creek will be completed at the end of the open water season when the complete dataset is compiled.
- Discharge measurements were collected at the five stations along Dome Creek. Salt dilution gauging was used to measure the discharge at four stations: H-DC-B, H-DC-M WP, H-DC-R and H-DC-D1b and volumetric methods were used at H-DC-DX+105. August discharge values along Dome Creek ranged from 0.002 to 0.019 m³/s.
- The discharge at the Pony Creek station, H-PC-DSP, was measured using salt dilution gauging techniques. The August discharge (0.006 m³/s) was greater than the July discharge.
- A discharge measurement was collected at the Back Creek station, H-BC, using salt dilution gauging methods with a discharge value of 0.041 m³/s, which represents a higher discharge than the July discharge.
- The H-SEEP volumetric discharge measurement on August 2, 2016 (0.002 m³/s) was the same as the flow rate observed at the pump in the seepage pond shack (0.002 m³/s).
- At H-DC-M WP, a negligible amount of water was flowing under the V-notch weir plate. The sandbags along the right downstream side continue to stop water from flowing around the weir, as intended. A salt tracer discharge measurement was completed.
- Placer mining operations along Pony Creek were underway during the August 2016 visit. Large earthworks using heavy equipment were observed. Placer activity continues to produce non-representative hydrological conditions along Pony Creek.

WATER QUALITY

Water quality samples and in-situ data were collected at all planned sites with flowing water during the August 2016 trip. A total of 19 sites were sampled and the three remaining seepage sites had no evidence of flow (Attachment 4). The LC50 sample was collected at the WQ-SEEP site this trip. The drinking water sample, including a bacteriological sample, was collected from the pumphouse well (WQ-PW) on August 3. All samples were submitted for analysis through ALS Laboratories under chain of custody documentation, except for the bacteriological sample which was submitted to Yukon Government – Health and Social Services for analysis.

Site conditions were noted and a record of the samples collected were compiled (Attachment 4). In-situ and laboratory results summary tables as well as the lab certificates of analysis are attached (Attachment 4 and Attachment 5). Parameters that exceeded the Canadian Council of Ministers of the Environment Freshwater Aquatic Life (CCME-AL) guidelines and/or the Mount Nansen Effluent Quality Standards (EQS) criteria are highlighted in Attachment 4 and discussed below.



Many results reflect typical summer conditions at Mount Nansen when there is a decrease in surface runoff and water levels following the end of the spring melt – resulting in lower concentrations of many parameters of concern compared to April and May sampling results.

Water Quality Results Summary

- The WQ-SEEP samples exceeded CCME-AL guidelines for ammonia, total and dissolved arsenic and iron. Total iron and manganese exceeded Mount Nansen EQS.
- Tailings Pond (WQ-TP) samples exceeded CCME-AL guidelines for fluoride, for total and dissolved arsenic, cadmium, copper, as well as for total lead, silver and zinc.
- On Dome Creek, CCME-AL guidelines were exceeded for the following parameters and sites: fluoride (WQ-DC-DX+105, WQ-DC-D1B), total aluminum (WQ-DC-DX, WQ-DC-D1B, WQ-DC-B, WQ-DC-U), total and dissolved arsenic (all sites), total and dissolved cadmium (WQ-DC-DX+105, WQ-DC-D1B), total copper (WQ-DC-D1B, WQ-DC-B, WQ-DC-U), total iron (all sites), dissolved iron (WQ-DC-DX, WQ-DC-D1B, WQ-DC-R), total lead WQ-DC-D1B), total and dissolved zinc (WQ-DC-DX+105 and WQ-DC-D1B). Total iron exceeded Mount Nansen EQS for WQ-DC-DX, WQ-DC-D1B, WQ-DC-B, WQ-DC-U and WQ-DC-R. Total manganese exceeded Mount Nansen EQS for WQ-DC-DX+105, WQ-DC-D1B, WQ-DC-B and WQ-DC-U. Total zinc exceeded Mount Nansen EQS for WQ-DC-DX+105. Total suspended solids also exceeded Mount Nansen EQS for WQ-DC-D1B and WQ-DC-B.
- On Victoria Creek CCME-AL guidelines were exceeded for the following parameters and sites: total aluminum and total iron (WQ-VC-R, WQ-VC-DBC, WQ-VC-UMN), total arsenic, copper and lead for WQ-VC-R. Total iron exceeded also Mount Nansen EQS for WQ-VC-R.
- Back Creek (WQ-BC) samples exceeded CCME-AL guidelines for total aluminum, arsenic, cadmium, copper, iron, lead, and zinc. Total iron, manganese, and suspended solids also exceeded Mount Nansen EQS.
- The upstream (WQ-PC-U) and downstream (WQ-PC-D) Pony Creek sites had samples that exceeded CCME-AL guidelines for total ammonia, fluoride, total aluminum, arsenic, cadmium, copper, iron, lead, mercury, silver and zinc. Dissolved arsenic also exceeded CCME-AL guidelines at both sites. Total suspended solids, total iron and total manganese also exceeded Mount Nansen EQS at both sites. Placer mining activity was ongoing on Pony Creek upstream of the two water quality sites, thus samples are not considered representative of typical results for the creek.
- The upwelling seep above CH-P-13-01 exceeded CCME-AL guidelines total and dissolved aluminum, cadmium and zinc. Total zinc also exceeded Mount Nansen EQS.
- Dome East Slope Seep site WQ-DESS-01 sample exceeded CCME-AL guidelines for pH, total and dissolved aluminum, cadmium and zinc. Mount Nansen EQS were exceeded for total zinc. Site WQ-DESS-02 sample only exceeded CCME-AL guideline for total aluminum.



- The LC50 sample collected from the WQ-SEEP had a 96-hour LC50 result of 100% trout survival. Laboratory added in comments that all fish appeared healthy with no signs of stress at 96 hours.
- The bacteriological sample collected at WQ-PW on August 3, 2016 was absent of total coliforms and E. coli. All other sampling results for WQ-PW did not exceed CCME-AL guidelines and Mount Nansen EQS.

QA/QC Samples

Travel Blank Sample – did not have any parameters above detection limit. No contamination from storage or transport is suspected.

Field Blank Sample – did not have any parameters above detection limits. No contamination from field sampling methodology is suspected.

Replicate Sample(s) – the average RPD of the replicate sample WQ-DC-DX+105-r was 5% with an average difference of 8% for total and 3% for dissolved metals. Total titanium had RPD>20%.

The average RPD of the replicate sample WQ-VC-UMN-r was 3% with an average difference of 5% for total and 3% for dissolved metals. Total aluminum and dissolved sodium had RPD>20%.

PROGRAM RECOMMENDATIONS

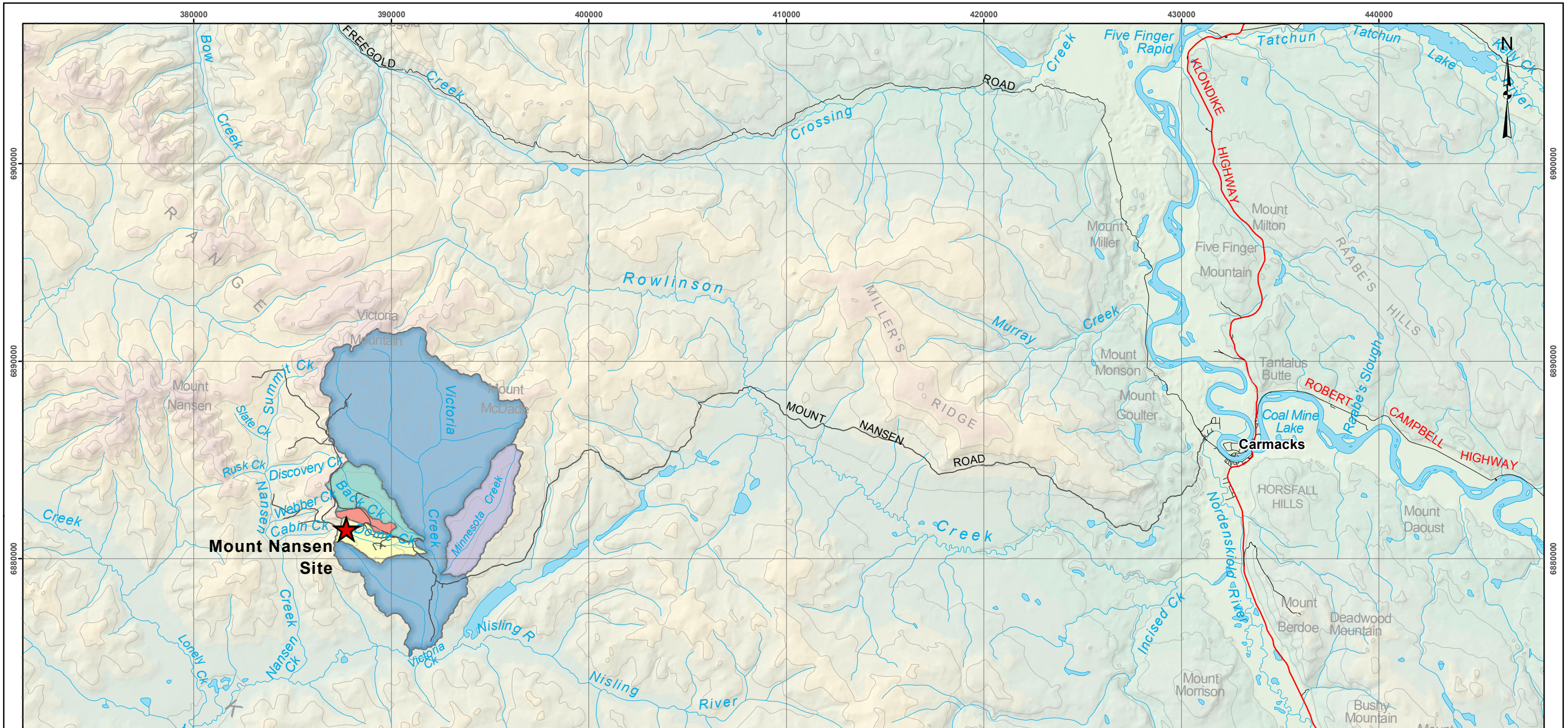
- Conduct velocity-area and salt tracer discharge measurements at all hydrometric stations during the open water season, where possible, to continue to validate the salt tracer method.

ADDITIONAL TRIP INFORMATION

Any changes to project scope (i.e. additional sites sampled):	None. All sampling and monitoring was conducted within scope. The next trip is scheduled for September 6 – 8, 2016. The next trip will be the seventh of the 2016/2017 Water Resources Investigation.
Any alterations to sample schedule/budget:	None
Additional Comments:	None
Wildlife Sightings:	None
Site concerns (safety):	None



**ATTACHMENT 1: MAPS OF HYDROMETRIC
STATIONS AND WATER
QUALITY SITES**



Regional Overview Map of Mount Nansen Site

Legend

Local Drainage Area

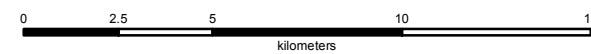
- Back Creek
- Dome Creek
- Minnesota Creek
- Pony Creek
- Victoria Creek

- Topographic Contour
- Secondary Road
- Highway

Data sources
 1:250,000 Topographic Spatial Data courtesy of Her Majesty the Queen in Right of Canada, Department of Natural Resources. All Rights Reserved.

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

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



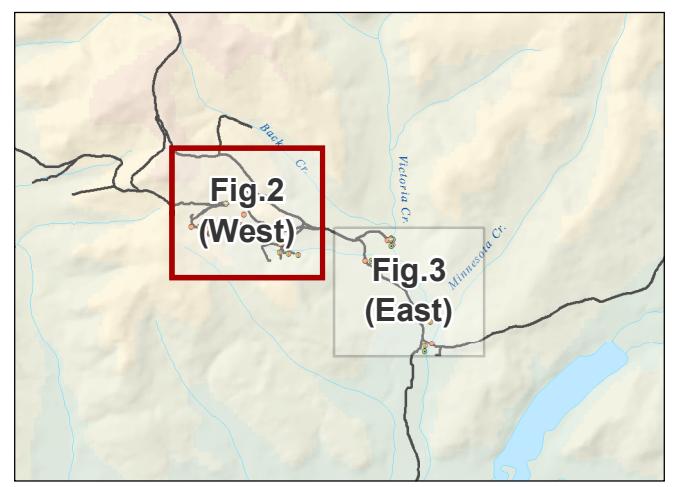
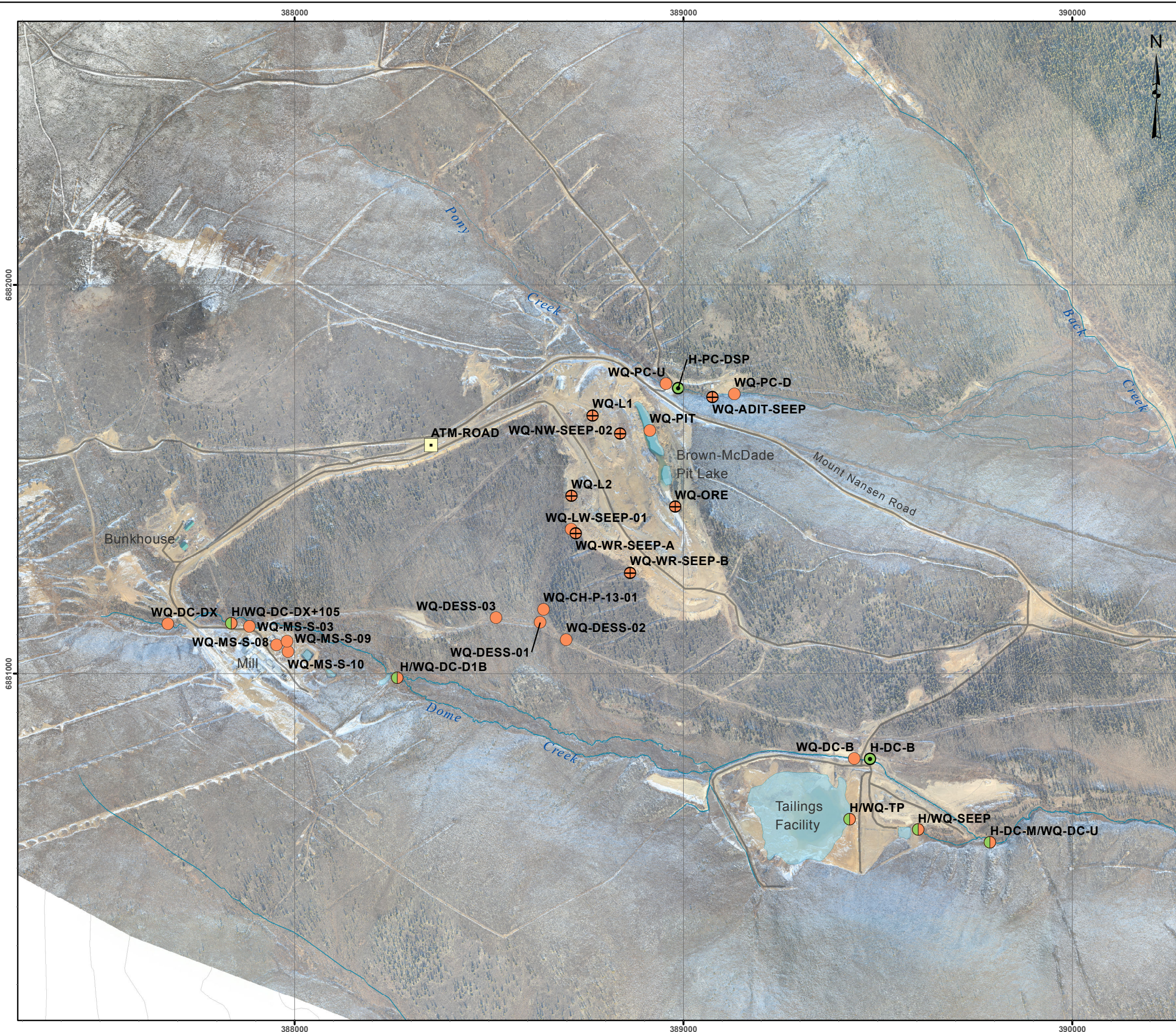
Map Scale: 1:200,000 (printed on 11 x 17)
 Map Projection: NAD 1983 UTM Zone 8N

Drawn: LG	Checked: MM / JB	Date: 14/07/2016	FIGURE 1
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Yukon





Legend

- Atmospheric Station (label e.g. ATM-ROAD)
- Hydrometric Station and Water Quality Site (label e.g. H/WQ-VC-UMN)
- Hydrometric Station (label e.g. H-VC-R)
- Water Quality Site (label e.g. WQ-PC-U)
- + Temporary Water Quality Site (label e.g. WQ-MS-S-03)
- Unpaved Road/Access

Mount Nansen Site (West): Hydrometric Stations and Water Quality Sites

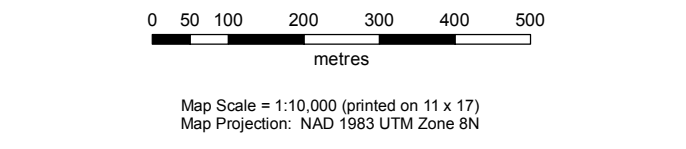
Notes:

1:50,000 and 1:250,000 Topographic Spatial Data provided by Geomatics - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

Watercourse, drainage areas and Mount Nansen Road layers digitized / modified by EDI (2011) using orthophotos provided by Yukon Government, Energy, Mines and Resources (2011).

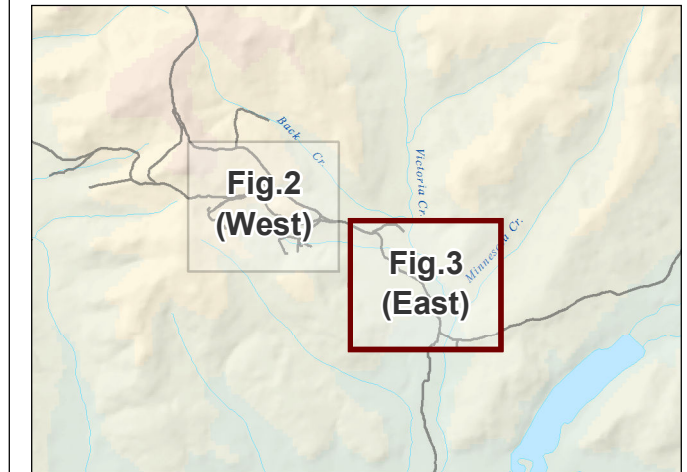
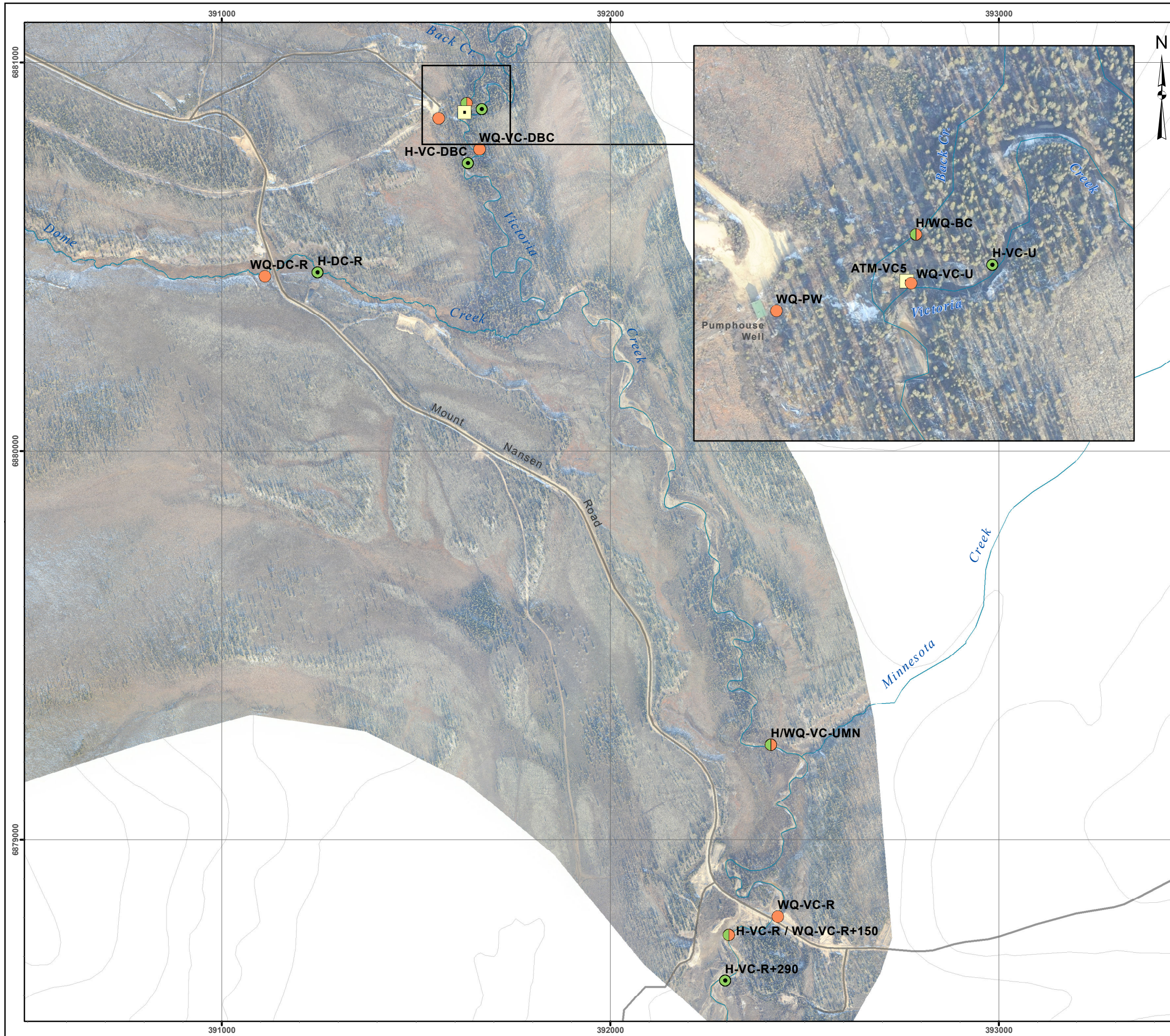
Imagery provided by Yukon Government - Energy, Mines and Resources - Abandoned Mines Branch.

Project data displayed is site specific. Data collected by EDI Environmental Dynamics Inc. (2015) was obtained using Garmin GPS technology.



Drawn: MP	Checked: MM/SD	Date: 04/08/2016	FIGURE 2
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Legend

- Atmospheric Station (label e.g. ATM-ROAD)
- Hydrometric Station and Water Quality Site (label e.g. H/WQ-VC-UMN)
- Hydrometric Station (label e.g. H-VC-R)
- Water Quality Site (label e.g. WQ-PC-U)
- ⊕ Temporary Water Quality Site (label e.g. WQ-MS-S-03)
- Unpaved Road/Access

Mount Nansen Site (East): Hydrometric Stations and Water Quality Sites

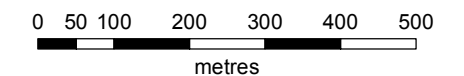
Notes:

1:50,000 and 1:250,000 Topographic Spatial Data provided by Geomatics - Yukon Government via online source (Corporate Spatial Warehouse) www.geomaticsyukon.ca.

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Map Scale = 1:10,000 (printed on 11 x 17)
Map Projection: NAD 1983 UTM Zone 8N

Drawn: MP	Checked: MM/SD	Date: 14/07/2016	FIGURE 3
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**ATTACHMENT 2: SITE AND STATION
 PHOTOS**

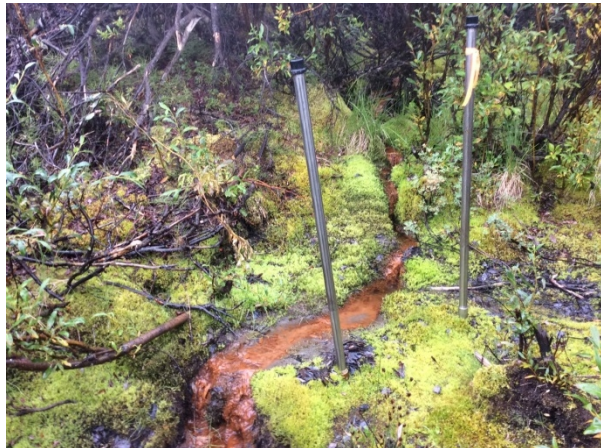


Photo 1. WQ-DC-DX – looking upstream.



Photo 2. H-DC-DX+105 – looking downstream at metal trough installed for volumetric measurements.



Photo 3. WQ-DC-DX+105 – looking upstream.



Photo 4. H/WQ-DC-D1b – looking upstream.



Photo 5. WQ-CH-P-13-01 – looking upstream.

Refer to H-DC-B photos (Photos 7
and 8)

Photo 6. WQ-DC-B – no photo available



Photo 7. H-DC-B – looking downstream.



Photo 8. H-DC-B – looking upstream.



Photo 9. WQ-TP – overview of tailings pond.



Photo 10. H-TP –overview of tailings pond showing wetted lower staff gauge.



Photo 11. H/WQ-SEEP – looking downstream.



Photo 12. H-DC-M WP – looking downstream of V-notch weir plate.



Photo 13. H-DC-M WP – looking upstream at weir pond.

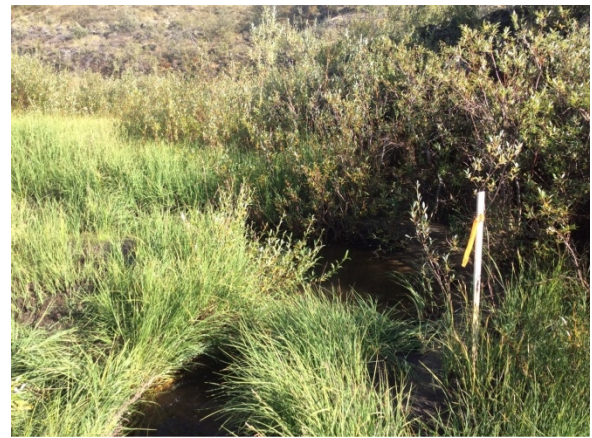


Photo 14. WQ-DC-U – looking downstream.



Photo 15. WQ-DC-R – looking downstream.



Photo 16. H-DC-R – looking upstream.



Photo 17. WQ-PC-U – looking upstream.



Photo 18. H-PC-DSP – looking upstream.



Photo 19. WQ-ADIT-SEEP – overview of dry site; no sample collected.



Photo 20. WQ-PC-D – looking upstream.



Photo 21. WQ-NW-SEEP-02 – overview of site.
Pipe outlet dry.



Photo 22. H/WQ-BC – looking upstream.



Photo 23. H-VC-U – looking downstream.



Photo 24. WQ-VC-U – looking upstream.



Photo 25. WQ-VC-U – looking downstream at confluence of Victoria Creek and Back Creek.



Photo 26. WQ-VC-DBC – looking downstream.



Photo 27. H-VC-DBC – looking upstream.



Photo 28. H/WQ-VC-UMN – looking downstream.



Photo 29. WQ-VC-R – overview looking upstream.



Photo 30. H-VC-R+290 – looking downstream.



Photo 31. WQ-DESS-01 – overview of sample site.



Photo 32. WQ-DESS-02 – overview of sample site.



Photo 33. WQ-DESS-03 – overview, site dry.



Photo 34. WQ-PW – overview of sample site.



ATTACHMENT 3: **AUGUST
HYDROLOGY DATA
TABLES**

Measurement ID	Hydrometric Identifier (HID)	Measurement Date	Measurement Time	Discharge Measurement Method	Discharge (m ³ /s)	Discharge Data Flag	Surveyed Water Elevation (m)	Survey Data Flag	Comments
1468	ATM-VC5	02/08/2016	12:20	N	-	-	-	-	Barologger downloaded successfully and functioning properly.
1469	H-PC-DSP	02/08/2016	16:18	SS	0.006	-	-	-	Evidence of recent flood conditions with sediment and debris trapped in bank vegetation approximately 0.05 to 0.10 m above bankfull conditions. Salt tracer completed for discharge measurement.
1470	H-DC-DX+105	03/08/2016	9:30	V	0.002	-	-	-	Small amount of flow was not captured during volumetric discharge method. Visually estimated non-captured portion to be less than 0.0001 m ³ /s.
1471	H-DC-D1b	03/08/2016	10:24	SS	0.005	-	-	-	Salt tracer completed for discharge measurement. Water goes to ground approximately 2 m downstream of small waterfall.
1472	H-DC-B	02/08/2016	18:42	SS	0.008	-	1.926	-	Logger downloaded and functioning properly.
1473	H-DC-M WP	01/08/2016	18:45	SS	0.010	-	-	-	All water contained within weir pond. Trace amount of flow between metal weir plate and wooden support structure.
1474	H-DC-R	01/08/2016	15:32	SS	0.019	-	0.489	-	Salt tracer completed for discharge measurement.
1475	H-VC-U	02/08/2016	14:08	ADV-MID	0.503	-	2.116	-	Logger downloaded and functioning properly.
1476	H-VC-DBC	02/08/2016	10:48	ADV-MID	0.539	-	1.861	-	Light turbidity in channel due to placer mining works upstream. Logger downloaded and functioning properly. Well is stable.
1477	H-BC	02/08/2016	13:51	SS	0.041	-	1.766	-	Salt tracer discharge measurement completed. Highly turbid water due to upstream placer mining activity. Logger downloaded successfully and functioning properly.
1478	H-VC-UMN	02/08/2016	8:38	ADV-MID	0.606	-	1.672	-	Logger downloaded and functioning properly. Minor amount of accumulated silt inside stilling well was flushed out using logger rod.
1479	H-VC-R+290	01/08/2016	13:18	ADV-MID	0.699	-	2.47	-	Logger downloaded and functioning properly.
1480	H-SEEP	02/08/2016	17:20	V	0.002	-	-	-	Volumetric measurement collected at pipe outlet. Flow rate at pump at 17:20 142.358 L/min (0.002 m ³ /s).
1481	H-TP	02/08/2016	18:00	N	-	-	-	-	Low water level in tailings pond. Lowest staff gauge is wetted to 0.706 m.

Discharge Measurement Method Legend

Measurement Method ID	Measurement Method	Measurement Description
ADV-MID	Mid Section Method - Acoustic Doppler Velocimeter	Cross-sectional velocity using an ADV, mid-section method.
SS	Brine Salt Slug Tracer	Salt dilution gauging using a brine salt slug.
V	Volumetric	Volumetric measurement obtained by filling a graduated container at a culvert, pipe outlet or weir.
W	Weir	Measurement obtained by a rated structure (v-notch weir).
N	None	No measurement could be obtained.
SD	Dry Salt Slug Tracer	Salt dilution gauging using a dry salt slug.
HWM	High Water Mark - Indirect Method	Indirect method using high water mark in the slope-area calculation for estimating high discharges.
ADCP	Acoustic Doppler Current Profiler	Cross-sectional velocity using an ADCP, mid-section method.
SC	Constant Rate Salt Tracer	Salt dilution gauging using the constant rate method.
CM-MID	Mid Section Method - Current Meter	Cross-sectional velocity using a velocimeter (Swoffer or Pygmy AA)

Hydrometric Stations

Hydrometric ID	Hydrometric Stations
ATM-VC5	Atmospheric Barologger (5) at Victoria Creek
H-BC	Back Creek
H-DC-B	Diversion Channel at Bridge
H-DC-D1B	Dome Creek at D1b
H-DC-DX	Dome Creek at DX
H-DC-DX+105	Dome Creek at DX+105
H-DC-M-WP	Middle Dome Creek at Weir Pond
H-DC-R	Dome Creek at Road
H-PC-DSP	Pony Creek Downstream of Pit
H-SEEP	Seepage Pond Outflow
H-TP	Tailings Pond
H-VC-DBC	Victoria Creek Downstream of Back Creek
H-VC-R	Victoria Creek at Road
H-VC-R+290	Victoria Creek at Road + 290
H-VC-U	Upper Victoria Creek
H-VC-UMN	Victoria Creek Upstream of Minnesota Creek

Discharge Data Flag Legend

Discharge Data Flag	Discharge Data Flag Description
E	Estimated value
B	Backwater effects (ice related)
F	Instrument malfunction
M	Manual measurement
A	Automated measurement (logged)
ML	Missing length data
MD	Missing depth data
MW	Missing width data
O	Outside of measurement reporting range
S	Suspect data
X	Poor channel conditions for discharge measurement
MI	Missing Data
SH-L	Data logger Shift
SH-SG	Staff Gauge Shift
UR	Under review

Survey Data Flag Legend

Survey Flag	Survey Flag Description
S	Suspect data
MI	Missing data
UR	Under review
F	Instrument Malfunction
O	Outside measurement Accuracy (+/-0.003 m)
N	No survey conducted



ATTACHMENT 4: **AUGUST WATER
QUALITY DATA
TABLES**

Water Quality Site	Sample Collected? (Y/N)	Measurement Date	Comments
WQ-SEEP	Yes	02/08/2016	Site appears normal for time of year.
WQ-TP	Yes	02/08/2016	Water level is low.
WQ-DC-DX	Yes	03/08/2016	Site conditions are normal.
WQ-DC-DX+105	Yes	03/08/2016	High amounts of algae growth in stream bed.
WQ-DC-D1b	Yes	03/08/2016	Flow is moderate to high. Suspended particles in water due to erosion and recent heavy rains.
WQ-DC-B	Yes	01/08/2016	Low water level with lightly turbid water.
WQ-DC-U	Yes	01/08/2016	Moderate water level with lightly turbid water.
WQ-DC-R	Yes	01/08/2016	Regular sampling site has very small detectable flow, reddish tinge to water, large quantity of settled sediment.
WQ-VC-U	Yes	02/08/2016	Conditions are normal. Sample collected at regular location.
WQ-VC-R	Yes	01/08/2016	Turbidity higher than usual due to upstream placer activity.
WQ-VC-DBC	Yes	02/08/2016	Site appears normal for time of year. Sampled at regular location.
WQ-VC-UMN	Yes	02/08/2016	Sampled at regular left downstream bank site upstream of well.
WQ-BC	Yes	03/08/2016	Turbidity is high due to upstream placer mining site.
WQ-ADIT-SEEP	No	02/08/2016	Site dry. No sample collected.
WQ-PC-U	Yes	02/08/2016	High turbidity due to upstream placer activity. High sediment load has filled in downstream pool before culvert. Signs of recent flooding in area around creek. Sediment in grasses and small woody debris stacked in small vegetation.
WQ-PC-D	Yes	02/08/2016	High turbidity from upstream placer mining. Sampled from regular location.
WQ-CH-P-13-01	Yes	03/08/2016	Good flow from site. Samples collected from regular location.
WQ-DESS-01	Yes	03/08/2016	Site conditions normal for time of year.
WQ-DESS-02	Yes	03/08/2016	Strong flow.
WQ-DESS-03	No	03/08/2016	Site dry. Sample not collected.



Water Quality Site	Sample Collected? (Y/N)	Measurement Date	Comments
WQ-LW-SEEP-01	No	03/08/2016	Site dry. Sample not collected.
WQ-NW-SEEP-02	No	03/08/2016	Site dry. Sample not collected. Collection bag was placed on outlet pipe for over 40 hours prior to sampling visit.
WQ-PW	Yes	03/08/2016	Drinking water sample collected. BacT sample collected. Site appears normal.

Summary of Water Quality Results for the August 1 - 3, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1808128-1 WQ-SEEP 02/08/2016 17:10	L1808128-5 WQ-TP 02/08/2016 18:00	L1808128-20 WQ-DC-DX 03/08/2016 08:28	L1808128-19 WQ-DC-DX+105 03/08/2016 08:45	L1808128-16 WQ-DC-DX+105-R 03/08/2016 08:50	QA/QC WQ-DC-DX+105 Replicate Analysis	L1808128-14 WQ-DC-DX 03/08/2016 10:10	L1808128-4 WQ-DC-B 02/08/2016 18:25	L1808128-12 WQ-DC-U 01/08/2016 18:05	L1808128-11 WQ-DC-R 01/08/2016 16:40
Temperature (in-situ)	°C	-	-	-	11.1	18.3	3.8	0.3	-	-	5.3	11.8	14.7	11.7
Specific Conductivity (in-situ)	µS/cm	-	-	-	1498	1221	537.1	1445	-	-	1445	1178	1134	885
pH (in-situ)	pH	6.5 - 9.0	6.0 - 8.5	-	6.77	8.18	6.7	6.88	-	-	7.81	7.98	7.98	7.42
Dissolved Oxygen (in-situ)	mg/L	-	-	-	3.41	6.45	8.7	8.7	-	-	11.15	9	4.87	4.87
Turbidity (In-situ)	NTU	-	-	-	37.1	3.59	18.08	2.14	-	-	91.9	17.69	6.58	6.58
Colour, True	CU	15	-	5	-	-	-	-	-	-	-	-	-	-
Conductivity	µS/cm	-	-	2	1460	1220	521	1130	1150	2%	1440	1180	1120	869
Hardness (as CaCO3)	mg/L	-	-	0.5	832	712	289	703	704	0%	930	747	680	503
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	-	7.18	8.06	7.47	7.4	7.36	1%	7.99	7.93	8.04	7.67
Total Suspended Solids	mg/L	-	50	3	26	<3.0	4	<3.0	<3.0	<DL	269	59.3	26.7	4
Total Dissolved Solids	mg/L	-	-	1	1100	940	341	817	1110	0%	877	607	832	607
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	257	72.7	91.8	266	273	3%	255	186	184	146
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<DL	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<DL	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	257	72.7	91.8	266	273	3%	255	186	184	146
Ammonia, Total (as N)	mg/L	0.75	-	0.005	4.4	0.0071	0.0066	0.0285	0.0255	7%	0.23	0.172	0.533	0.0484
Chloride (Cl)	mg/L	120	-	0.5	1.5	<1.0	<1.0	<1.0	<1.0	<DL	<2.5	<1.0	<1.0	<0.50
Fluoride (F)	mg/L	0.12	-	0.02	0.086	0.214	0.066	0.187	0.185	1%	0.14	0.093	0.096	0.099
Nitrate (as N)	mg/L	13	-	0.005	0.414	<0.010	<0.0050	0.044	0.042	5%	0.077	0.063	0.335	0.449
Nitrite (as N)	mg/L	0.06	-	0.001	0.0123	<0.0020	<0.0010	<0.0020	<0.0020	<DL	<0.0050	<0.0020	0.0166	0.0116
Sulfate (SO4)	mg/L	-	-	0.5	600	610	174	399	400	0%	639	505	472	334
Anion Sum	meq/L	-	-	-	17.7	14.2	5.45	13.8	14.2	<DL	18.4	14.2	13.5	9.89
Cation Sum	meq/L	-	-	-	18.6	15.2	6.12	14.4	14.4	<DL	19.1	15.4	14.3	10.6
Cation - Anion Balance	%	-	-	-	2.4	3.6	5.7	2.8	2.8	<DL	1.7	3.8	2.7	3.3
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	0.0099	<0.0050	<0.0050	<0.0050	<0.0050	<DL	<0.0050	<0.0050	<0.0050	<0.0050
Cyanide, Total	mg/L	-	0.3	0.005	0.0235	<0.0050	<0.0050	<0.0050	<0.0050	<DL	<0.0050	<0.0050	<0.0050	<0.0050
Cyanate	mg/L	-	-	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<DL	<0.20	<0.20	<0.20	<0.20
Thiocyanate (SCN)	mg/L	-	-	0.5	5.37	<0.50	<0.50	<0.50	<0.50	<DL	<0.50	<0.50	<0.50	<0.50
Aluminum (Al)-Total	mg/L	0.1	-	0.003	0.0269	0.0294	0.804	0.0107	0.0033	106%	3.69	0.99	0.411	0.0517
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.00045	0.0372	0.00133	0.00953	0.0092	4%	0.00803	0.00246	0.00149	0.00127
Arsenic (As)-Total	mg/L	0.005	-	0.0001	0.0634	0.0992	0.0242	0.0343	0.0304	12%	0.0785	0.0209	0.0209	0.0141
Barium (Ba)-Total	mg/L	-	1.0	0.00005	0.0669	0.0109	0.0554	0.0138	0.0134	3%	0.104	0.0825	0.0662	0.0486
Beryllium (Be)-Total	mg/L	-	-	0.00002	<0.00020	<0.00020	0.00057	<0.00020	<0.00020	<DL	0.000141	0.000054	0.000028	0.000122
Bismuth (Bi)-Total	mg/L	-	-	0.0005	0.00011	<0.00050	<0.00050	<0.00050	<0.00050	<DL	0.000057	<0.00050	<0.00050	<0.00050
Boron (B)-Total	mg/L	-	-	0.01	0.051	0.066	<0.010	<0.010	<0.010	<DL	0.038	0.019	0.024	0.018
Cadmium (Cd)-Total (Lab Result)	mg/L	0.00009	0.02	0.00001	0.000277	0.000723	0.0000613	0.0019	0.00186	2%	0.00147	0.00016	0.000101	0.0000438
Cadmium (Cd)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.00001	0.0004	0.0004	0.0004	0.0004	0.0004	-	0.0004	0.0004	0.0004	0.0004
Calcium (Ca)-Total	mg/L	-	-	0.05	242	217	84.2	184	185	1%	210	163	161	121
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	0.00054	0.00012	0.0013	<0.00010	<0.00010	<DL	0.00617	0.00203	0.00089	0.0003
Cobalt (Co)-Total	mg/L	-	-	0.0001	0.00753	0.00034	0.00071	0.00073	0.00076	4%	0.00255	0.00083	0.00163	0.0009
Copper (Cu)-Total (Lab Result)	mg/L	0.002	0.2	0.0005	0.00363	0.0241	0.00366	<0.00050	<0.00050	<DL	0.0125	0.00481	0.00297	0.00799
Copper (Cu)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.0005	0.004	0.004	0.004	0.004	0.004	-	0.004	0.004	0.004	0.004
Iron (Fe)-Total	mg/L	0.3	1	0.01	9.81	0.221	3.56	0.324	0.318	2%	9.54	4.02	2.47	1.28
Lead (Pb)-Total (Lab Result)	mg/L	0.001	0.1	0.00005	0.000094	0.000987	0.00195	0.000085	0.000067	<2xDL	0.0111	0.00172	0.000678	0.00031
Lead (Pb)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.00005	0.007	0.007	0.007	0.007	0.007	-	0.007	0.007	0.007	0.007
Lithium (Li)-Total	mg/L	-	-	0.0005	<0.0010	0.0086	<0.0010	0.0079	0.009	13%	0.0099	0.0045	0.0031	0.0021
Magnesium (Mg)-Total	mg/L	-	-	0.1	55.1	43	21.6	59.7	59.7	0%	96	75.5	61.8	45.1
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	5.04	0.0683	0.283	1.12	1.13	1%	1.12	0.598	1.27	0.448
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	<0.000050	0.000098	0.000007	<0.000050	<0.000050	<DL	0.000092	0.000109	<0.000050	<0.000050
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	0.000893	0.00128	0.00059	0.000316	0.000316	3%	0.000427	0.000421	0.000466	0.000356
Nickel (Ni)-Total (Lab Result)	mg/L	0.025	0.3	0.0005	0.00262	0.00055	0.0008	0.00119	0.00118	<2xDL	0.000454	0.00195	0.00155	0.00099
Nickel (Ni)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.0005	0.15	0.15	0.15	0.15	0.15	-	0.15	0.15	0.15	0.15
Phosphorus (P)-Total	mg/L	-	-	0.05	0.063	<0.050	<0.050	<0.050	<0.050	<DL	0.209	0.053	<0.050	<0.050
Potassium (K)-Total	mg/L	-	-	0.1	7.24	15.7	4.56	3.57	3.57	1%	4.4	3.39	3.56	2.61
Selenium (Se)-Total	mg/L	0.001	-	0.0001	0.000226	0.000064	0.000083	<0.000050	<0.000050	<DL	0.000241	0.00013	0.000122	0.000103
Silicon (Si)-Total	mg/L	-	-	0.05	7.52	2.9	6.23	6.91	7.73	1%	11.9	7.73	6.09	6.09
Silver (Ag)-Total	mg/L	0.00025	0.1	0.00001	0.000029	0.00026	0.000048	<0.000010	<0.000010	<DL	0.000208	0.000044	0.000017	<0.000010
Sodium (Na)-Total	mg/L	-	-	0.05	34.8	14	4	5.05	5.05	0%	6.99	7.36	11.8	9.73
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.702	0.543	0.242	0.408	0.422	3%	0.555	0.533	0.423	0.423
Sulfur (S)-Total	mg/L	-	-	0.5	224	228	64.1	137	138	1%	210	179	165	119
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	0.000021	0.000021	0.00003	0.000104	0.000104	0%	0.000103	0.000022	0.00001	<0.000010
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<DL	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	-	-	0.0003	0.00121	0.00032	0.0364	<0.00030	<0.00030	<DL	0.17	0.0448	0.018	0.0105
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.00181	0.000917	0.000193	0.00419	0.00435	4%	0.004	0.00244	0.0018	0.00122
Vanadium (V)-Total	mg/L	-	-	0.0005	0.00219	<0.00050	0.0034	<0.00050	<0.00050	<DL	0.0154	0.00562	0.00288	0.00069
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	0.0174	0.0443	0.0094	0.617	0.604	2%	0.617	0.0203	0.0105	0.0059
Zirconium (Zr)-Total	mg/L	-	-	0.0003	0.00063	<0.00030	<0.00030	<0.00030	<0.00030	<DL	0.00038	<0.00030	<0.00030	<0.00030

Summary of Water Quality Results for the August 1 - 3, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1808128-1 WQ-SEEP 02/08/2016 17:10	L1808128-5 WQ-TP 02/08/2016 18:00	L1808128-20 WQ-DC-DX 03/08/2016 08:28	L1808128-19 WQ-DC-DX+105 03/08/2016 08:45	L1808128-16 WQ-DC-DX+105-R 03/08/2016 08:50	QA/QC WQ-DC-DX+105 Replicate Analysis	L1808128-14 WQ-DC-D18 03/08/2016 10:10	L1808128-4 WQ-DC-B 02/08/2016 18:25	L1808128-12 WQ-DC-U 01/08/2016 18:05	L1808128-11 WQ-DC-R 01/08/2016 16:40
Aluminum (Al)-Dissolved	mg/L	0.1	-	0.001	0.008	0.0124	0.008	0.0012	<0.0010	<DL	0.0066	0.0155	0.0299	0.0149
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	0.00036	0.0352	0.0085	0.00935	0.0091	3%	0.00634	0.00205	0.00138	0.00116
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	0.0271	0.0762	0.00941	0.00868	0.00785	10%	0.0165	0.0053	0.0118	0.00696
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0437	0.0104	0.0448	0.0138	0.0136	1%	0.0498	0.0659	0.0591	0.0492
Beryllium (Be)-Dissolved	mg/L	-	-	0.00002	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<DL	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth (Bi)-Dissolved	mg/L	-	-	0.00005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<DL	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Dissolved	mg/L	-	-	0.01	0.046	0.061	<0.010	<0.010	<0.010	<DL	0.038	0.018	0.022	0.017
Cadmium (Cd)-Dissolved (Lab Result)	mg/L	0.00009	-	0.00001	0.000097	0.00055	0.00002	0.000642	0.00063	2%	0.0000875	0.000101	0.000189	0.0000335
Cadmium (Cd)-Diss. (Hardness Adjusted Guideline)	mg/L	-	-	0.00001	0.0004	0.0004	0.0004	0.0004	0.0004	-	0.0004	0.0004	0.0004	0.0004
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	240	214	80.9	185	184	1%	211	168	165	123
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	0.00032	<0.00010	<0.00010	<0.00010	<0.00010	<DL	<0.00010	<0.00010	0.00015	0.00022
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	0.00503	0.0003	0.0005	0.00072	0.00073	1%	0.00042	0.00038	0.00134	0.00088
Copper (Cu)-Dissolved (Lab Result)	mg/L	0.002	-	0.0002	0.00177	0.0182	0.00119	<0.00020	<0.00020	<DL	0.00064	0.00065	0.00148	0.00132
Copper (Cu)-Diss. (Hardness Adjusted Guideline)	mg/L	-	-	0.002	0.004	0.004	0.004	0.004	0.004	-	0.004	0.004	0.004	0.004
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	6.1	<0.010	0.898	0.098	0.099	1%	0.448	0.129	0.229	0.415
Lead (Pb)-Dissolved (Lab Result)	mg/L	0.001	-	0.00005	<0.000050	0.000511	0.000078	<0.000050	<0.000050	<DL	<0.000050	<0.000050	0.00032	<0.000050
Lead (Pb)-Diss. (Hardness Adjusted Guideline)	mg/L	-	-	0.00005	0.007	0.007	0.007	0.007	0.007	-	0.007	0.007	0.007	0.007
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	<0.0010	0.0081	<0.0010	0.0076	0.0084	10%	0.0077	0.0039	0.0027	0.002
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	56.5	42.9	21	58.6	59.6	2%	97.7	79.3	65	47.3
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	3.39	0.0424	0.404	1.12	1.1	2%	0.947	0.571	1.22	0.437
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<DL	<0.000050	<0.000050	<0.000050	<0.000050
Molybdenum (Mo)-Dissolved	mg/L	0.0073	-	0.00005	0.000816	0.00124	0.000057	0.000304	0.000289	5%	0.000286	0.00035	0.00045	0.000327
Nickel (Ni)-Dissolved (Lab Result)	mg/L	0.025	-	0.0005	0.00159	<0.00050	<0.00050	0.00119	0.00116	<2xDL	<0.00050	0.00069	0.00084	0.00078
Nickel (Ni)-Diss. (Hardness Adjusted Guideline)	mg/L	-	-	0.0005	0.15	0.15	0.15	0.15	0.15	-	0.15	0.15	0.15	0.15
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<DL	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	-	-	0.1	7.36	15.9	4.51	3.47	3.49	1%	4.14	3.39	3.57	2.56
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	0.000152	<0.000050	0.000054	<0.000050	<0.000050	<DL	0.000051	0.000083	0.000086	0.00008
Silicon (Si)-Dissolved	mg/L	-	-	0.05	7.28	2.83	5.13	6.81	6.81	0%	6.06	6.27	6.2	6.2
Silver (Ag)-Dissolved	mg/L	0.00025	-	0.00001	<0.000010	0.000057	<0.000010	<0.000010	<0.000010	<DL	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)-Dissolved	mg/L	-	-	0.05	23.4	13.4	3.85	5.04	4.95	2%	6.75	7.34	11.7	9.86
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.642	0.529	0.244	0.401	0.407	1%	0.556	0.529	0.527	0.41
Sulfur (S)-Dissolved	mg/L	-	-	0.5	210	218	61.1	131	132	2%	207	176	161	116
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	0.000218	<0.000010	0.000093	0.000093	0%	0.000013	<0.000010	<0.000010	<0.000010
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<DL	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Dissolved	mg/L	-	-	0.0003	0.00051	<0.00030	<0.00030	<0.00030	<0.00030	<DL	<0.00030	<0.00030	0.00034	0.0004
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.000162	0.000866	0.000132	0.00406	0.00219	3%	0.00319	0.00219	0.00171	0.00117
Vanadium (V)-Dissolved	mg/L	-	-	0.001	0.001	<0.00050	<0.00050	<0.00050	<0.00050	<DL	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	0.0099	0.0256	0.0027	0.606	0.598	1%	0.0946	0.0033	0.0023	0.0033
Zirconium (Zr)-Dissolved	mg/L	-	-	0.0003	0.00051	<0.00030	<0.00030	<0.00030	<0.00030	<DL	<0.00030	<0.00030	<0.00030	<0.00030

Applied Guidelines: Federal CCME Canadian Environmental Quality Guidelines (January 2015), CCME: Freshwater

Aquatic Life / Mount Nansen Effluent Discharge Standards

COLOUR KEY:

Exceeds CCME Guideline

Exceeds MN Effluent Discharge Standards

Exceeds both CCME and MN Standards

Exceeds Hardness Dependent Calculated Guideline (CCME)

Data flag for Detection Limit Adjustment -> Please refer to the lab COA report and lab excel report for more info

QA/QC Codes: RPD - Relative Percent Difference, <DL - below detection limit, and <2XDL - less than two times the detection limit.

Notes:

QA/QC Comments:

The Travel Blank sample did not have any parameters above detection limit. No contamination from storage or transport is suspected.

The Field Blank did not have any parameters above detection limits. No contamination from field sampling methodology is suspected.

QA/QC Replicate Analysis -

The average RPD of the replicate sample WQ-DC-DX+105-r was 5% with an average difference of 8% for total and 3% for dissolved metals.

Total titanium had RPD>20%.

The average RPD of the replicate sample WQ-VC-UMN-r was 3% with an average difference of 5% for total and 3% for dissolved metals.

Total aluminum and dissolved sodium had RPD>20%.

Summary of Water Quality Results for the August 1 - 3, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1808128-9 WQ-VC-U 02/08/2016 12:30	L1808128-10 WQ-VC-R 01/08/2016 14:45	L1808128-6 WQ-VC-DBC 02/08/2016 11:15	L1808128-8 WQ-VC-UMN 02/08/2016 08:31	L1808128-7 WQ-VC-UMN-R 02/08/2016 09:00	QA/QC WQ-VC-UMN Replicate Analysis	L1808128-22 WQ-VC-WC 03/08/2016 15:15	L1808128-2 WQ-VC-U 02/08/2016 16:00	L1808128-21 WQ-VC-P 03/08/2016 12:54	L1808128-13 WQ-CH-P 03/08/2016 11:35
Temperature (in-situ)	°C	-	-	-	7.6	10.7	6.7	5.5	-	-	15	10.6	12.5	1.4
Specific Conductivity (in-situ)	µS/cm	-	-	-	159.5	296.4	180.7	207.7	-	-	385.3	525	524.6	1355
pH (in-situ)	pH	6.5 - 9.0	6.0 - 8.5	-	7.54	7.73	7.6	7.74	-	-	8.29	7.66	8.02	6.55
Dissolved Oxygen (in-situ)	mg/L	-	-	-	9.55	9.41	9.75	10.29	-	-	9.19	9.1	9.05	11.78
Turbidity (In-situ)	NTU	-	-	-	0.46	18.48	5.94	4.54	-	-	78.8	364	249	0.16
Colour, True	CU	15	-	5	-	-	-	-	-	-	-	-	-	-
Conductivity	µS/cm	-	-	2	159	195	182	206	205	0%	382	543	621	1340
Hardness (as CaCO3)	mg/L	-	-	0.1	93.8	92	93	108	108	5%	199	283	325	852
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	-	7.73	7.8	7.75	7.79	7.79	0%	8.06	7.59	7.82	6.57
Total Suspended Solids	mg/L	-	50	3	<3.0	22.7	4.7	7.3	6.7	<2xDL	76	242	165	<3.0
Total Dissolved Solids	mg/L	-	-	1	85.4	107	98.8	116	116	1%	238	357	415	1070
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	70.1	70.6	73.2	75.4	75.3	0%	91.2	72.4	73.3	11.2
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	70.6	73.2	75.4	75.3	75.3	0%	91.2	72.4	73.3	11.2
Ammonia, Total (as N)	mg/L	0.75	-	0.005	<0.0050	0.0117	0.0106	0.0087	0.0081	<2xDL	0.152	1.05	1.2	<0.0050
Chloride (Cl)	mg/L	120	-	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<DL	<0.50	0.73	0.81	<1.0
Fluoride (F)	mg/L	0.12	-	0.02	0.056	0.062	0.062	0.062	0.062	<2xDL	0.104	0.132	0.15	0.05
Nitrate (as N)	mg/L	13	-	0.005	0.0377	0.0628	0.0549	0.0649	0.0631	3%	0.0996	0.0353	0.0422	0.045
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<DL	0.0073	0.003	0.004	<0.0020
Sulfate (SO4)	mg/L	-	-	0.5	12.7	28.5	19.6	29.7	29.7	0%	105	200	241	761
Anion Sum	meq/L	-	-	-	1.67	2.01	1.88	2.13	2.13	<DL	4.02	5.63	6.51	16.1
Cation Sum	meq/L	-	-	-	1.71	2.02	1.97	2.22	2.31	<DL	4.23	6.08	6.95	17.4
Cation - Anion Balance	%	-	-	-	1.3	0.2	1.3	2	2	<DL	2.7	3.8	3.3	3.9
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<DL	<0.0050	<0.0050	<0.0050	<0.0050
Cyanide, Total	mg/L	-	0.3	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<DL	<0.0050	<0.0050	<0.0050	<0.0050
Cyanate	mg/L	-	-	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<DL	<0.20	0.87	<0.20	<0.20
Thiocyanate (SCN)	mg/L	-	-	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<DL	<0.50	<0.50	<0.50	<0.50
Aluminum (Al)-Total	mg/L	0.1	-	0.003	0.0366	0.0986	0.16	0.173	0.141	20%	2.22	7.99	4.43	0.161
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	<0.00010	0.00049	0.00026	0.0003	0.00029	<2xDL	0.00184	0.00684	0.00463	0.00014
Arsenic (As)-Total	mg/L	0.005	-	0.0001	0.0004	0.00198	0.00216	0.00205	0.00205	5%	0.0207	0.105	0.0595	0.00067
Barium (Ba)-Total	mg/L	-	1.0	0.00005	0.0622	0.0738	0.0647	0.0652	0.0658	1%	0.0921	0.224	0.179	0.0107
Beryllium (Be)-Total	mg/L	-	-	0.00002	<0.000020	0.000045	<0.000020	<0.000020	<0.000020	<DL	0.000102	0.000399	0.000337	0.000031
Bismuth (Bi)-Total	mg/L	-	-	0.0005	0.00007	<0.000050	<0.000050	<0.000050	<0.000050	<DL	0.000192	0.000897	0.000416	<0.000050
Boron (B)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<DL	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd)-Total (Lab Result)	mg/L	0.00009	0.02	0.00001	0.0000121	0.000147	0.0000428	0.0000493	0.0000466	<2xDL	0.000335	0.00128	0.000968	0.00041
Cadmium (Cd)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.00001	0.0001	0.0002	0.0001	0.0002	0.0002	-	0.0003	0.0004	0.0004	0.0004
Calcium (Ca)-Total	mg/L	-	-	0.05	20.8	24.8	24.1	29	29	1%	57.4	83.6	96.6	214
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	0.00014	0.00122	0.00029	0.00028	0.00032	<2xDL	0.00202	0.00484	0.00254	0.00013
Cobalt (Co)-Total	mg/L	-	-	0.0001	<0.00010	0.00061	0.00016	0.00017	0.00031	<2xDL	0.00123	0.00351	0.00225	<0.00010
Copper (Cu)-Total (Lab Result)	mg/L	0.002	0.2	0.0005	0.00153	0.00367	0.00188	0.00187	0.00182	<2xDL	0.00677	0.0182	0.0101	0.00109
Copper (Cu)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.0005	0.002	0.002	0.002	0.002	0.002	-	0.004	0.004	0.004	0.004
Iron (Fe)-Total	mg/L	0.3	1	0.01	0.086	1.52	0.316	0.326	0.289	12%	3.39	12.6	6.71	0.037
Lead (Pb)-Total (Lab Result)	mg/L	0.001	0.1	0.00005	<0.000050	0.00525	0.00109	0.00108	0.00103	5%	0.0132	0.0513	0.0302	0.000057
Lead (Pb)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.00005	0.002	0.003	0.003	0.003	0.004	-	0.007	0.007	0.007	0.007
Lithium (Li)-Total	mg/L	-	-	0.0005	<0.0010	0.0015	<0.0010	0.0011	<0.0010	<DL	0.0025	0.0048	0.0039	0.0019
Magnesium (Mg)-Total	mg/L	-	-	0.1	7.22	8.36	7.93	9.17	9.31	2%	13	17.9	18.9	76.3
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	0.0246	0.115	0.0813	0.0752	0.0784	4%	0.583	1.28	1.24	0.162
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<DL	0.000137	0.000477	0.000428	<0.000050
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	0.000354	0.000583	0.000467	0.000486	0.000454	7%	0.00126	0.000995	0.00104	<0.000050
Nickel (Ni)-Total (Lab Result)	mg/L	0.025	0.3	0.0005	<0.00050	0.00115	<0.00050	<0.00050	<0.00050	<DL	0.0018	0.00389	0.00231	0.00642
Nickel (Ni)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.0005	0.080667861	0.091038755	0.089707943	0.097748126	0.101333771	-	0.15	0.15	0.15	0.15
Phosphorus (P)-Total	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<DL	0.059	0.155	0.15	<0.050
Potassium (K)-Total	mg/L	-	-	0.1	0.64	1.09	0.78	0.84	0.82	2%	1.76	4.9	2.95	0.44
Selenium (Se)-Total	mg/L	0.001	-	0.0001	<0.000050	0.000081	0.000062	0.000057	0.000061	<2xDL	0.000123	0.000153	0.000132	<0.000050
Silicon (Si)-Total	mg/L	-	-	0.05	6.14	8.18	6.58	6.6	6.6	1%	10.6	28.9	15.2	8.15
Silver (Ag)-Total	mg/L	0.00025	0.1	0.00001	<0.000010	0.000088	0.000016	0.000017	0.000014	<2xDL	0.000207	0.000946	0.00057	<0.000010
Sodium (Na)-Total	mg/L	-	-	0.05	2.23	2.66	2.4	2.72	2.8	3%	4.22	5.96	6.21	5.28
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.24	0.234	0.247	0.259	0.264	2%	0.331	0.38	0.439	0.479
Sulfur (S)-Total	mg/L	-	-	0.5	4.69	10	7.15	10.9	11	1%	34.3	71	80.5	279
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	<0.000010	0.000025	<0.000010	<0.000010	<0.000010	<DL	0.000046	0.000136	0.000077	<0.000010
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<DL	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	-	-	0.0003	0.00071	0.0034	0.00516	0.0045	0.0045	14%	0.0576	0.0926	0.0503	0.00037
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.000363	0.000785	0.000591	0.0006	0.00062	3%	0.00203	0.00172	0.00201	0.00013
Vanadium (V)-Total	mg/L	-	-	0.0005	<0.00050	0.00288	0.00088	0.00082	0.00079	<2xDL	0.00614	0.0205	0.0118	<0.00050
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	<0.0030	0.0129	0.0046	0.0047	0.0046	<2xDL	0.0313	0.141	0.0835	3.09
Zirconium (Zr)-Total	mg/L	-	-	0.0003	<0.00030	0.00038	<0.00030	<0.00030	<0.00030	<DL	0.00039	0.00069	0.00097	<0.00030

Summary of Water Quality Results for the August 1 - 3, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1808128-9 WQ-VC-U 02/08/2016 12:30	L1808128-10 WQ-VC-R 01/08/2016 14:45	L1808128-6 WQ-VC-DBC 02/08/2016 11:15	L1808128-8 WQ-VC-UMN 02/08/2016 08:31	L1808128-7 WQ-VC-UMN-R 02/08/2016 09:00	QA/QC WQ-VC-UMN Replicate Analysis	L1808128-22 WQ-BC 03/08/2016 15:15	L1808128-2 WQ-PC-U 02/08/2016 16:00	L1808128-21 WQ-PC-O 03/08/2016 12:54	L1808128-13 WQ-CH-P-13-01 03/08/2016 11:35
Aluminum (Al)-Dissolved	mg/L	0.1	-	0.001	0.0244	0.0302	0.0209	0.0191	0.0195	2%	0.0251	0.007	0.0099	0.152
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	<0.00010	0.00022	0.00016	0.0002	0.00021	<2xDL	0.00095	0.0023	0.00245	0.00011
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	0.00033	0.00112	0.00065	0.00093	0.00095	2%	0.00467	0.0213	0.0187	0.00047
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0615	0.0583	0.0603	0.061	0.0608	0%	0.0653	0.089	0.0971	0.0104
Beryllium (Be)-Dissolved	mg/L	-	-	0.00002	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<DL	<0.000020	<0.000020	<0.000020	0.000032
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<DL	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<DL	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd)-Dissolved (Lab Result)	mg/L	0.00009	-	0.00001	0.000133	0.000256	0.000177	0.000201	0.000214	<2xDL	0.000629	0.00102	0.00163	0.00027
Cadmium (Cd)-Diss. (Hardness Adjusted Guideline)	mg/L	-	-	0.00001	0.0001	0.0002	0.0001	0.0002	0.0002	-	0.0003	0.0004	0.0004	0.0004
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	20.5	24.5	24	26.6	28.6	7%	58.2	85.3	99.1	213
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	0.00012	0.00013	0.00011	0.00011	0.00011	<2xDL	0.00012	<0.00010	<0.00010	0.00011
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	<0.00010	0.00013	<0.00010	<0.00010	<0.00010	<DL	0.00034	0.00057	0.00061	<0.00010
Copper (Cu)-Dissolved (Lab Result)	mg/L	0.002	-	0.0002	0.00132	0.00164	0.00133	0.00141	0.00134	5%	0.00182	0.00121	0.00196	0.00096
Copper (Cu)-Diss. (Hardness Adjusted Guideline)	mg/L	-	-	0.002	0.002	0.002238906	0.002202142	0.002425258	0.002525511	-	0.004	0.004	0.004	0.004
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	0.054	0.088	0.059	0.058	0.059	2%	0.033	0.018	0.012	0.031
Lead (Pb)-Dissolved (Lab Result)	mg/L	0.001	-	0.00005	<0.000050	0.00017	<0.000050	0.000061	0.000054	<2xDL	0.000137	0.000121	0.000147	<0.000050
Lead (Pb)-Diss. (Hardness Adjusted Guideline)	mg/L	-	-	0.00005	0.002394848	0.002932639	0.002861188	0.003303591	0.003509077	-	0.007	0.007	0.007	0.007
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<DL	0.0016	0.0021	0.0023	0.0017
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	7	7.93	7.79	8.82	8.94	1%	13	17.1	18.8	77.7
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.0215	0.0772	0.0706	0.0659	0.0659	1%	0.538	1.11	1.14	0.147
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<DL	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Dissolved	mg/L	0.0073	-	0.00005	0.000345	0.00053	0.000456	0.000449	0.000446	1%	0.00122	0.000754	0.000917	<0.000050
Nickel (Ni)-Dissolved (Lab Result)	mg/L	0.025	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<DL	<0.00050	<0.00050	0.00077	0.00591
Nickel (Ni)-Diss. (Hardness Adjusted Guideline)	mg/L	-	-	0.0005	0.080667861	0.093038755	0.089707943	0.09748126	0.101333771	-	0.15	0.15	0.15	0.15
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<DL	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	-	-	0.1	0.6	0.73	0.71	0.74	0.75	1%	1.3	2.4	2.27	0.45
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	<0.000050	0.000053	<0.000050	0.000058	0.000054	<2xDL	0.000081	0.000069	0.000093	0.000055
Silicon (Si)-Dissolved	mg/L	-	-	0.05	6.08	6.28	6.33	6.21	6.23	0%	6.41	6.53	6.17	8.23
Silver (Ag)-Dissolved	mg/L	0.00025	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<DL	0.000011	<0.000010	<0.000010	<0.000010
Sodium (Na)-Dissolved	mg/L	-	-	0.05	2.18	2.65	2.34	3.22	2.64	20%	4.39	5.54	6.31	5.17
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.238	0.234	0.243	0.253	0.252	0%	0.345	0.37	0.431	0.467
Sulfur (S)-Dissolved	mg/L	-	-	0.5	4.48	9.69	7.03	10.6	10.5	1%	35.1	70.7	83.3	269
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<DL	0.000011	<0.000010	0.000012	<0.000010
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<DL	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Dissolved	mg/L	-	-	0.0003	<0.00030	0.00032	<0.00030	<0.00030	<0.00030	<DL	0.00036	<0.00030	<0.00030	<0.00030
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.000344	0.000691	0.000562	0.000573	0.000572	0%	0.00197	0.0014	0.00179	<0.000010
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<DL	0.00081	0.00057	0.00061	<0.00050
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	0.0013	0.0012	<0.0010	0.0017	0.0017	<2xDL	0.0015	0.0042	0.0151	3.08
Zirconium (Zr)-Dissolved	mg/L	-	-	0.0003	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<DL	<0.00030	<0.00030	<0.00030	<0.00030

Applied Guidelines: Federal CCME Canadian Environmental Quality Guidelines (January 2015), CCME: Freshwater Aquatic Life / Mount Nansen Effluent Discharge Standards

COLOUR KEY:
Exceeds CCME Guideline
Exceeds MN Effluent Discharge Standards
Exceeds both CCME and MN Standards
Exceeds Hardness Dependent Calculated Guideline (CCME)
Data flag for Detection Limit Adjustment -> Please refer to the lab COA report and lab excel report for more info
QA/QC Codes: RPD - Relative Percent Difference, <DL - below detection limit, and <2XDL - less than two times the detection limit.

Summary of Water Quality Results for the August 1 - 3, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1808128-18 WQ-DESS-01 03/08/2016 11:15	L1808128-17 WQ-DESS-02 03/08/2016 11:50	L1808090-1 WQ-PW 03/08/2016 15:00	L1808128-15 FIELD BLANK 03/08/2016 09:00	L1808128-3 TRAVEL BLANK 03/08/2016 00:00
Temperature (in-situ)	°C	-	-	-	2.5	1.4	0.5		
Specific Conductivity (in-situ)	µS/cm	-	-	-	980	1857	363.3		
pH (in-situ)	pH	6.5 - 9.0	6.0 - 8.5	-	7.23	7.42	7.7		
Dissolved Oxygen (in-situ)	mg/L	-	-	-	11.28	12.41	1.25		
Turbidity (In-situ)	NTU	-	-	-	5.37	1.71	0.14		
Colour, True	CU	15	-	5	-	-	<5.0		
Conductivity	µS/cm	-	-	2	973	1800	354	<2.0	<2.0
Hardness (as CaCO3)	mg/L	-	-	0.5	574	1180	182	<0.50	<0.50
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	6.47	7.82	7.93	5.12	5.05
Total Suspended Solids	mg/L	-	50	3	14.7	9.3	-	<3.0	<3.0
Total Dissolved Solids	mg/L	-	-	1	732	1540	197	<1.0	<1.0
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	8.2	135	-	<1.0	<1.0
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	-	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	-	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	-	-	-	8.2	135	162	<1.0	<1.0
Ammonia, Total (as N)	mg/L	0.75	-	0.005	0.0111	<0.0050	<0.0050	0.0285	
Chloride (Cl)	mg/L	120	-	0.5	<1.0	<2.5	<0.50	<0.50	<0.50
Fluoride (F)	mg/L	0.12	-	0.02	0.04	<0.10	0.112	<0.020	<0.020
Nitrate (as N)	mg/L	13	-	0.005	0.016	5.28	0.124	<0.0050	<0.0050
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0020	<0.0050	<0.0010	<0.0010	<0.0010
Sulfate (SO4)	mg/L	-	-	0.5	523	992	32.7	<0.30	<0.30
Anion Sum	meq/L	-	-	-	11.1	23.7	3.93	<0.10	<0.10
Cation Sum	meq/L	-	-	-	11.7	24	3.87	<0.10	<0.10
Cation - Anion Balance	%	-	-	-	2.9	0.6	-0.8	0	0
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cyanide, Total	mg/L	-	0.3	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cyanate	mg/L	-	-	0.2	0.22	<0.20	-	<0.20	<0.20
Thiocyanate (SCN)	mg/L	-	-	0.5	<0.50	<0.50	-	<0.50	<0.50
Aluminum (Al)-Total	mg/L	0.1	-	0.003	0.162	0.134	<0.010	<0.0030	<0.0030
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.00019	0.00027	<0.00050	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	0.005	-	0.0001	0.0009	0.00412	0.00041	<0.00010	<0.00010
Barium (Ba)-Total	mg/L	-	1.0	0.00005	0.0201	0.0248	0.084	<0.00050	<0.00050
Beryllium (Be)-Total	mg/L	-	-	0.00002	0.000031	<0.000040	-	<0.000020	<0.000020
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.000050	<0.00010	-	<0.000050	<0.000050
Boron (B)-Total	mg/L	-	-	0.01	<0.010	<0.020	<0.10	<0.010	<0.010
Cadmium (Cd)-Total (Lab Result)	mg/L	0.00009	0.02	0.00001	0.00389	0.000087	<0.00020	<0.000050	<0.000050
Cadmium (Cd)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.00001	0.0004	0.0004	0.0003	0.0004	0.0004
Calcium (Ca)-Total	mg/L	-	-	0.05	142	366	41.9	<0.050	<0.050
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	0.00024	<0.00020	<0.0020	<0.00010	<0.00010
Cobalt (Co)-Total	mg/L	-	-	0.0001	0.00019	<0.00020	-	<0.00010	<0.00010
Copper (Cu)-Total (Lab Result)	mg/L	0.002	0.2	0.0005	0.00229	0.0019	<0.0010	<0.00050	0.00078
Copper (Cu)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.0005	0.004	0.004	0.004	0.004	0.004
Iron (Fe)-Total	mg/L	0.3	1	0.01	0.159	0.143	<0.030	<0.010	<0.010
Lead (Pb)-Total (Lab Result)	mg/L	0.001	0.1	0.00005	0.000105	0.00065	0.00059	<0.000050	<0.000050
Lead (Pb)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.00005	0.007	0.007	0.007	0.007	0.007
Lithium (Li)-Total	mg/L	-	-	0.0005	0.0013	<0.0020	18.9	<0.0010	<0.0010
Magnesium (Mg)-Total	mg/L	-	-	0.1	46.6	62	<0.020	<0.10	<0.10
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	0.0462	0.0188	<0.00020	<0.00010	<0.00010
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	<0.000050	<0.000050	-	<0.000050	<0.000050
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	0.000057	0.00015	-	<0.000050	<0.000050
Nickel (Ni)-Total (Lab Result)	mg/L	0.025	0.3	0.0005	0.0041	<0.0010	-	<0.00050	<0.00050
Nickel (Ni)-Total (Hardness Adjusted Guideline)	mg/L	-	-	0.0005	0.15	0.15	0.15	0.15	0.15
Phosphorus (P)-Total	mg/L	-	-	0.05	<0.050	<0.050	-	<0.050	<0.050
Potassium (K)-Total	mg/L	-	-	0.1	0.29	0.64	0.93	<0.10	<0.10
Selenium (Se)-Total	mg/L	0.001	-	0.0001	0.000067	0.00026	<0.0010	<0.000050	<0.000050
Silicon (Si)-Total	mg/L	-	-	0.05	7.92	6.3	-	<0.050	<0.050
Silver (Ag)-Total	mg/L	0.00025	0.1	0.00001	0.000014	<0.000020	-	<0.000010	<0.000010
Sodium (Na)-Total	mg/L	-	-	0.05	4.01	7.9	4.6	<0.050	<0.050
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.317	0.698	-	<0.00020	<0.00020
Sulfur (S)-Total	mg/L	-	-	0.5	168	327	-	<0.50	<0.50
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	<0.000010	<0.000020	-	<0.000010	<0.000010
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00020	-	<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	-	-	0.0003	0.00217	0.00339	-	<0.00030	<0.00030
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.000014	0.00168	0.0018	<0.000010	<0.000010
Vanadium (V)-Total	mg/L	-	-	0.0005	0.00055	<0.0010	-	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	3.79	<0.0060	<0.050	<0.0030	<0.0030
Zirconium (Zr)-Total	mg/L	-	-	0.0003	<0.00030	<0.00060	-	<0.00030	<0.00030

Summary of Water Quality Results for the August 1 - 3, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1808128-18 WQ-DESS-01 03/08/2016 11:15	L1808128-17 WQ-DESS-02 03/08/2016 11:50	L1808090-1 WQ-PW 03/08/2016 15:00	L1808128-15 FIELD BLANK 03/08/2016 09:00	L1808128-3 TRAVEL BLANK 03/08/2016 00:00
Aluminum (Al)-Dissolved	mg/L	0.1	-	0.001	0.105	0.0133		<0.0010	
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	0.00018	0.00023		<0.00010	
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	0.00066	0.00247		<0.00010	
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0198	0.0243		<0.000050	
Beryllium (Be)-Dissolved	mg/L	-	-	0.00002	<0.000020	<0.000040		<0.000020	
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.000050	<0.00010		<0.000050	
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	<0.020		<0.010	
Cadmium (Cd)-Dissolved (Lab Result)	mg/L	0.00009	-	0.00001	0.0004	0.00066		<0.000050	
Cadmium (Cd)-Diss. (Hardness Adjusted Guideline)	mg/L	-	-	0.00001	0.0004	0.0004	0.0003	0.0004	0.0004
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	148	372		<0.050	
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	0.00014	<0.00020		<0.00010	
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	0.00018	<0.00020		<0.00010	
Copper (Cu)-Dissolved (Lab Result)	mg/L	0.002	-	0.0002	0.00152	0.00047		<0.00020	
Copper (Cu)-Diss. (Hardness Adjusted Guideline)	mg/L	-	-	0.002	0.004	0.004	0.004	0.004	0.004
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	0.092	<0.010		<0.010	
Lead (Pb)-Dissolved (Lab Result)	mg/L	0.001	-	0.00005	<0.000050	<0.00010		<0.000050	
Lead (Pb)-Diss. (Hardness Adjusted Guideline)	mg/L	-	-	0.00005	0.007	0.007	0.007	0.007	0.007
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	0.0011	<0.0020		<0.0010	
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	49.5	61.6		<0.10	
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.0467	0.00363		0.00013	
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.000050	<0.000050		<0.000050	
Molybdenum (Mo)-Dissolved	mg/L	0.0073	-	0.00005	<0.000050	0.00015		<0.000050	
Nickel (Ni)-Dissolved (Lab Result)	mg/L	0.025	-	0.0005	0.00394	<0.0010		<0.00050	
Nickel (Ni)-Diss. (Hardness Adjusted Guideline)	mg/L	-	-	0.0005	0.15	0.15	0.15	0.15	0.15
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050		<0.050	
Potassium (K)-Dissolved	mg/L	-	-	0.1	0.31	0.65		<0.10	
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	0.000052	0.00026		<0.000050	
Silicon (Si)-Dissolved	mg/L	-	-	0.05	8.31	6.21		<0.050	
Silver (Ag)-Dissolved	mg/L	0.00025	-	0.00001	<0.000010	<0.000020		<0.000010	
Sodium (Na)-Dissolved	mg/L	-	-	0.05	4.07	7.92		<0.050	
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.332	0.695		<0.00020	
Sulfur (S)-Dissolved	mg/L	-	-	0.5	174	321		<0.50	
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	<0.000020		<0.000010	
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00020		<0.00010	
Titanium (Ti)-Dissolved	mg/L	-	-	0.0003	0.0007	<0.00060		<0.00030	
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.000011	0.00168		<0.000010	
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.00050	<0.0010		<0.00050	
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	1.86	0.0023		<0.0010	
Zirconium (Zr)-Dissolved	mg/L	-	-	0.0003	<0.00030	<0.00060		<0.00030	

Applied Guidelines: Federal CCME Canadian Environmental Quality Guidelines (January 2015), CCME: Freshwater Aquatic Life / Mount Nansen Effluent Discharge Standards

COLOUR KEY:
Exceeds CCME Guideline
Exceeds MN Effluent Discharge Standards
Exceeds both CCME and MN Standards
Exceeds Hardness Dependent Calculated Guideline (CCME)
Data flag for Detection Limit Adjustment -> Please refer to the lab COA report and lab excel report for more info
QA/QC Codes: RPD - Relative Percent Difference, <DL - below detection limit, and <2XDL - less than two times the detection limit.

ATTACHMENT 5:

**LABORATORY
CERTIFICATES OF
ANALYSIS AND
YUKON
ENVIRONMENTAL
HEALTH SERVICES
BACTERIOLOGICAL
RESULTS**



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

Date Received: 03-AUG-16
Report Date: 16-AUG-16 18:13 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1808128
Project P.O. #: NOT SUBMITTED
Job Reference: MOUNT NANSEN 16-Y-0089
C of C Numbers: 1, 2, 3, 4
Legal Site Desc:

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	L1808128-1	L1808128-2	L1808128-3	L1808128-4	L1808128-5
		Description	Water	Water	Water	Water	Water
		Sampled Date	02-AUG-16	02-AUG-16	03-AUG-16	02-AUG-16	02-AUG-16
		Sampled Time	17:10	16:00		18:25	18:00
		Client ID	WQ-SEEP	WQ-PC-U	TRAVEL BLANK	WQ-DC-B	WQ-TP
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		1460	543	<2.0	1180	1220
	Hardness (as CaCO3) (mg/L)		832	283	<0.50	747	712
	pH (pH)		7.18	7.59	5.05	7.93	8.06
	Total Suspended Solids (mg/L)		26.0	242	<3.0	59.3	<3.0
	Total Dissolved Solids (mg/L)		1100	357	<1.0	877	940
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		257	72.4	<1.0	186	72.7
	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)		257	72.4	<1.0	186	72.7
	Ammonia, Total (as N) (mg/L)		4.40	1.05	0.0285 ^{RRV}	0.172	0.0071
	Chloride (Cl) (mg/L)		1.5	0.73	<0.50	<1.0 ^{DLDS}	<1.0 ^{DLDS}
	Fluoride (F) (mg/L)		0.086	0.132	<0.020	0.093	0.214
	Nitrate (as N) (mg/L)		0.414	0.0353	<0.0050	0.063	<0.010
	Nitrite (as N) (mg/L)		0.0123	0.0030	<0.0010	<0.0020 ^{DLDS}	<0.0020 ^{DLDS}
	Sulfate (SO4) (mg/L)		600	200	<0.30	505	610
	Anion Sum (meq/L)		17.7	5.63	<0.10	14.2	14.2
	Cation Sum (meq/L)		18.6	6.08	<0.10	15.4	15.2
	Cation - Anion Balance (%)		2.4	3.8	0.0	3.8	3.6
	Cyanides	Cyanide, Weak Acid Diss (mg/L)		0.0099	<0.0050	<0.0050	<0.0050
Cyanide, Total (mg/L)			0.0235	<0.0050	<0.0050	<0.0050	<0.0050
Cyanate (mg/L)			<0.20	0.87	<0.20	<0.20	<0.20
Thiocyanate (SCN) (mg/L)			5.37	<0.50	<0.50	<0.50	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)		0.0269	7.99	<0.0030	0.990	0.0294
	Antimony (Sb)-Total (mg/L)		0.00045	0.00684	<0.00010	0.00246	0.0372
	Arsenic (As)-Total (mg/L)		0.0634	0.105	<0.00010	0.0196	0.0992
	Barium (Ba)-Total (mg/L)		0.0669	0.224	<0.000050	0.0825	0.0109
	Beryllium (Be)-Total (mg/L)		<0.000020	0.000399	<0.000020	0.000054	<0.000020
	Bismuth (Bi)-Total (mg/L)		<0.000050	0.000897	<0.000050	<0.000050	0.000110
	Boron (B)-Total (mg/L)		0.051	<0.010	<0.010	0.019	0.066
	Cadmium (Cd)-Total (mg/L)		0.000277	0.00128	<0.0000050	0.000160	0.000723
	Calcium (Ca)-Total (mg/L)		242	83.6	<0.050	163	217
	Chromium (Cr)-Total (mg/L)		0.00054	0.00484	<0.00010	0.00203	0.00012
	Cobalt (Co)-Total (mg/L)		0.00753	0.00351	<0.00010	0.00083	0.00034
	Copper (Cu)-Total (mg/L)		0.00363	0.0182	0.00078	0.00481	0.0241
	Iron (Fe)-Total (mg/L)		9.81	12.6	<0.010	4.02	0.221
	Lead (Pb)-Total (mg/L)		0.000094	0.0513	<0.000050	0.00172	0.00987
	Lithium (Li)-Total (mg/L)		<0.0010	0.0048	<0.0010	0.0045	0.0086

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1808128-6	L1808128-7	L1808128-8	L1808128-9	L1808128-10
		Description	Water	Water	Water	Water	Water
		Sampled Date	02-AUG-16	02-AUG-16	02-AUG-16	02-AUG-16	01-AUG-16
		Sampled Time	11:15	09:00	08:31	12:30	14:45
		Client ID	WQ-VC-DBC	WQ-VC-UMN-R	WQ-VC-UMN	WQ-VC-U	WQ-VC-R
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		182	205	206	159	195
	Hardness (as CaCO3) (mg/L)		92.0	108	103	80.0	93.8
	pH (pH)		7.75	7.79	7.79	7.73	7.80
	Total Suspended Solids (mg/L)		4.7	6.7	7.3	<3.0	22.7
	Total Dissolved Solids (mg/L)		98.8	116	115	85.4	107
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		73.2	75.3	75.4	70.1	70.6
	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)		73.2	75.3	75.4	70.1	70.6
	Ammonia, Total (as N) (mg/L)		0.0106	0.0081	0.0087	<0.0050	0.0117
	Chloride (Cl) (mg/L)		<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)		0.062	0.062	0.062	0.056	0.065
	Nitrate (as N) (mg/L)		0.0549	0.0631	0.0649	0.0377	0.0628
	Nitrite (as N) (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sulfate (SO4) (mg/L)		19.6	29.7	29.7	12.7	28.5
	Anion Sum (meq/L)		1.88	2.13	2.13	1.67	2.01
	Cation Sum (meq/L)		1.97	2.31	2.22	1.71	2.02
	Cation - Anion Balance (%)		2.3	4.0	2.0	1.3	0.2
	Cyanides	Cyanide, Weak Acid Diss (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050
Cyanide, Total (mg/L)			<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cyanate (mg/L)			<0.20	<0.20	<0.20	<0.20	<0.20
Thiocyanate (SCN) (mg/L)			<0.50	<0.50	<0.50	<0.50	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)		0.160	0.141	0.173	0.0366	0.986
	Antimony (Sb)-Total (mg/L)		0.00026	0.00029	0.00030	<0.00010	0.00049
	Arsenic (As)-Total (mg/L)		0.00198	0.00205	0.00216	0.00040	0.00578
	Barium (Ba)-Total (mg/L)		0.0647	0.0658	0.0652	0.0622	0.0738
	Beryllium (Be)-Total (mg/L)		<0.000020	<0.000020	<0.000020	<0.000020	0.000045
	Bismuth (Bi)-Total (mg/L)		<0.000050	<0.000050	<0.000050	<0.000050	0.000070
	Boron (B)-Total (mg/L)		<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)		0.0000428	0.0000466	0.0000493	0.0000121	0.000147
	Calcium (Ca)-Total (mg/L)		24.1	29.4	29.0	20.8	24.8
	Chromium (Cr)-Total (mg/L)		0.00029	0.00032	0.00028	0.00014	0.00122
	Cobalt (Co)-Total (mg/L)		0.00016	0.00017	0.00018	<0.00010	0.00061
	Copper (Cu)-Total (mg/L)		0.00188	0.00182	0.00187	0.00153	0.00367
	Iron (Fe)-Total (mg/L)		0.316	0.289	0.326	0.086	1.52
	Lead (Pb)-Total (mg/L)		0.00109	0.00103	0.00108	<0.000050	0.00525
	Lithium (Li)-Total (mg/L)		<0.0010	<0.0010	0.0011	<0.0010	0.0015

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1808128-11	L1808128-12	L1808128-13	L1808128-14	L1808128-15
		Description	Water	Water	Water	Water	Water
		Sampled Date	01-AUG-16	01-AUG-16	03-AUG-16	03-AUG-16	03-AUG-16
		Sampled Time	16:40	18:05	11:35	10:10	09:00
		Client ID	WQ-DC-R	WQ-DC-U	WQ-CH-P-13-01	WQ-DC-D1B	FIELD BLANK
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		869	1120	1340	1440	<2.0
	Hardness (as CaCO3) (mg/L)		502	680	852	930	<0.50
	pH (pH)		7.67	8.04	6.57	7.99	5.12
	Total Suspended Solids (mg/L)		4.0	26.7	<3.0	269	<3.0
	Total Dissolved Solids (mg/L)		607	832	1070	1110	<1.0
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		146	184	11.2	255	<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)		146	184	11.2	255	<1.0
	Ammonia, Total (as N) (mg/L)		0.0484	0.533	<0.0050	0.230	<0.0050
	Chloride (Cl) (mg/L)		<0.50	<1.0 ^{DLDS}	<1.0 ^{DLDS}	<2.5 ^{DLDS}	<0.50
	Fluoride (F) (mg/L)		0.099	0.096	0.050	0.14	<0.020
	Nitrate (as N) (mg/L)		0.449	0.335	0.045	0.077	<0.0050
	Nitrite (as N) (mg/L)		0.0116	0.0166	<0.0020 ^{DLDS}	<0.0050 ^{DLDS}	<0.0010
	Sulfate (SO4) (mg/L)		334	472	761	639	<0.30
	Anion Sum (meq/L)		9.89	13.5	16.1	18.4	<0.10
	Cation Sum (meq/L)		10.6	14.3	17.4	19.1	<0.10
	Cation - Anion Balance (%)		3.3	2.7	3.9	1.7	0.0
Cyanides	Cyanide, Weak Acid Diss (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanate (mg/L)		<0.20	<0.20	<0.20	0.37	<0.20
	Thiocyanate (SCN) (mg/L)		<0.50	<0.50	<0.50	<0.50	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)		0.0517	0.411	0.161	3.69	<0.0030
	Antimony (Sb)-Total (mg/L)		0.00127	0.00149	0.00014	0.00803	<0.00010
	Arsenic (As)-Total (mg/L)		0.0141	0.0209	0.00067	0.0785	<0.00010
	Barium (Ba)-Total (mg/L)		0.0486	0.0662	0.0107	0.104	<0.000050
	Beryllium (Be)-Total (mg/L)		0.000122	0.000028	0.000031	0.000141	<0.000020
	Bismuth (Bi)-Total (mg/L)		<0.000050	<0.000050	<0.000050	0.000057	<0.000050
	Boron (B)-Total (mg/L)		0.018	0.024	<0.010	0.038	<0.010
	Cadmium (Cd)-Total (mg/L)		0.0000438	0.000101	0.00841	0.00147	<0.000050
	Calcium (Ca)-Total (mg/L)		121	161	214	210	<0.050
	Chromium (Cr)-Total (mg/L)		0.00030	0.00089	0.00013	0.00617	<0.00010
	Cobalt (Co)-Total (mg/L)		0.00090	0.00163	<0.00010	0.00255	<0.00010
	Copper (Cu)-Total (mg/L)		0.00799	0.00297	0.00109	0.0125	<0.00050
	Iron (Fe)-Total (mg/L)		1.28	2.47	0.037	9.54	<0.010
	Lead (Pb)-Total (mg/L)		0.000310	0.000678	0.000057	0.0111	<0.000050
	Lithium (Li)-Total (mg/L)		0.0021	0.0031	0.0019	0.0099	<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		L1808128-16 Water 03-AUG-16 08:50 WQ-DC-DX-105-R	L1808128-17 Water 03-AUG-16 11:50 WQ-DESS-02	L1808128-18 Water 03-AUG-16 11:15 WQ-DESS-01	L1808128-19 Water 03-AUG-16 08:45 WQ-DC-DX-105	L1808128-20 Water 03-AUG-16 08:28 WQ-DC-DX
Grouping	Analyte					
WATER						
Physical Tests	Conductivity (uS/cm)	1150	1800	973	1130	521
	Hardness (as CaCO3) (mg/L)	704	1180	574	703	289
	pH (pH)	7.36	7.82	6.47	7.40	7.47
	Total Suspended Solids (mg/L)	<3.0	9.3	14.7	<3.0	4.0
	Total Dissolved Solids (mg/L)	817	1540	732	814	341
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	273	135	8.2	266	91.8
	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)	273	135	8.2	266	91.8
	Ammonia, Total (as N) (mg/L)	0.0265	<0.0050	0.0111	0.0285	0.0066
	Chloride (Cl) (mg/L)	<1.0 ^{DLDS}	<2.5 ^{DLDS}	<1.0 ^{DLDS}	<1.0 ^{DLDS}	<0.50
	Fluoride (F) (mg/L)	0.185	<0.10 ^{DLDS}	0.040	0.187	0.066
	Nitrate (as N) (mg/L)	0.042	5.28	0.016	0.044	<0.0050
	Nitrite (as N) (mg/L)	<0.0020 ^{DLDS}	<0.0050 ^{DLDS}	<0.0020 ^{DLDS}	<0.0020 ^{DLDS}	<0.0010
	Sulfate (SO4) (mg/L)	400	992	523	399	174
	Anion Sum (meq/L)	13.8	23.7	11.1	13.6	5.45
	Cation Sum (meq/L)	14.4	24.0	11.7	14.4	6.12
	Cation - Anion Balance (%)	2.3	0.6	2.9	2.8	5.7
	Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050
Cyanide, Total (mg/L)		<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cyanate (mg/L)		<0.20	<0.20	0.22	<0.20	<0.20
Thiocyanate (SCN) (mg/L)		<0.50	<0.50	<0.50	<0.50	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	0.0033	0.134	0.162	0.0107	0.804
	Antimony (Sb)-Total (mg/L)	0.00920	0.00027	0.00019	0.00953	0.00133
	Arsenic (As)-Total (mg/L)	0.0304	0.00412	0.00090	0.0343	0.0242
	Barium (Ba)-Total (mg/L)	0.0134	0.0248	0.0201	0.0138	0.0554
	Beryllium (Be)-Total (mg/L)	<0.000020	<0.000040 ^{DLA}	0.000031	<0.000020	0.000057
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.00010 ^{DLA}	<0.000050	<0.000050	<0.000050
	Boron (B)-Total (mg/L)	<0.010	<0.020 ^{DLA}	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.00186	0.000087	0.00389	0.00190	0.0000613
	Calcium (Ca)-Total (mg/L)	185	366	142	184	84.2
	Chromium (Cr)-Total (mg/L)	<0.00010	<0.00020 ^{DLA}	0.00024	<0.00010	0.00130
	Cobalt (Co)-Total (mg/L)	0.00076	<0.00020 ^{DLA}	0.00019	0.00073	0.00071
	Copper (Cu)-Total (mg/L)	<0.00050	0.0019	0.00229	<0.00050	0.00366
	Iron (Fe)-Total (mg/L)	0.318	0.143	0.159	0.324	3.56
	Lead (Pb)-Total (mg/L)	0.000067	0.00065	0.000105	0.000085	0.00195
	Lithium (Li)-Total (mg/L)	0.0090	<0.0020 ^{DLA}	0.0013	0.0079	<0.0010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1808128-21	L1808128-22			
		Description	Water	Water			
		Sampled Date	03-AUG-16	03-AUG-16			
		Sampled Time	12:54	15:15			
		Client ID	WQ-PC-D	WQ-BC			
Grouping	Analyte						
WATER							
Physical Tests	Conductivity (uS/cm)		621	382			
	Hardness (as CaCO3) (mg/L)		325	199			
	pH (pH)		7.82	8.06			
	Total Suspended Solids (mg/L)		165	76.0			
	Total Dissolved Solids (mg/L)		415	238			
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)		73.3	91.2			
	Alkalinity, Carbonate (as CaCO3) (mg/L)		<1.0	<1.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)		<1.0	<1.0			
	Alkalinity, Total (as CaCO3) (mg/L)		73.3	91.2			
	Ammonia, Total (as N) (mg/L)		1.20	0.152			
	Chloride (Cl) (mg/L)		0.81	<0.50			
	Fluoride (F) (mg/L)		0.150	0.104			
	Nitrate (as N) (mg/L)		0.0422	0.0996			
	Nitrite (as N) (mg/L)		0.0040	0.0073			
	Sulfate (SO4) (mg/L)		241	105			
	Anion Sum (meq/L)		6.51	4.02			
	Cation Sum (meq/L)		6.95	4.23			
	Cation - Anion Balance (%)		3.3	2.7			
	Cyanides	Cyanide, Weak Acid Diss (mg/L)		<0.0050	<0.0050		
Cyanide, Total (mg/L)			<0.0050	<0.0050			
Cyanate (mg/L)			<0.20	<0.20			
Thiocyanate (SCN) (mg/L)			<0.50	<0.50			
Total Metals	Aluminum (Al)-Total (mg/L)		4.43	2.22			
	Antimony (Sb)-Total (mg/L)		0.00463	0.00184			
	Arsenic (As)-Total (mg/L)		0.0595	0.0207			
	Barium (Ba)-Total (mg/L)		0.179	0.0921			
	Beryllium (Be)-Total (mg/L)		0.000237	0.000102			
	Bismuth (Bi)-Total (mg/L)		0.000416	0.000192			
	Boron (B)-Total (mg/L)		<0.010	<0.010			
	Cadmium (Cd)-Total (mg/L)		0.000968	0.000335			
	Calcium (Ca)-Total (mg/L)		96.6	57.4			
	Chromium (Cr)-Total (mg/L)		0.00254	0.00202			
	Cobalt (Co)-Total (mg/L)		0.00225	0.00123			
	Copper (Cu)-Total (mg/L)		0.0101	0.00677			
	Iron (Fe)-Total (mg/L)		6.71	3.39			
	Lead (Pb)-Total (mg/L)		0.0302	0.0132			
	Lithium (Li)-Total (mg/L)		0.0039	0.0025			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

16-AUG-16 18:13 (MT)

Version: FINAL

Sample ID Description Sampled Date Sampled Time Client ID		L1808128-1 Water 02-AUG-16 17:10 WQ-SEEP	L1808128-2 Water 02-AUG-16 16:00 WQ-PC-U	L1808128-3 Water 03-AUG-16 TRAVEL BLANK	L1808128-4 Water 02-AUG-16 18:25 WQ-DC-B	L1808128-5 Water 02-AUG-16 18:00 WQ-TP
Grouping	Analyte					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	55.1	17.9	<0.10	75.5	43.0
	Manganese (Mn)-Total (mg/L)	5.04	1.28	<0.00010	0.598	0.0683
	Mercury (Hg)-Total (mg/L)	<0.0000050	0.0000477	<0.0000050	0.0000109	0.0000098
	Molybdenum (Mo)-Total (mg/L)	0.000893	0.000995	<0.000050	0.000421	0.00128
	Nickel (Ni)-Total (mg/L)	0.00262	0.00389	<0.00050	0.00195	0.00055
	Phosphorus (P)-Total (mg/L)	0.063	0.155	<0.050	0.053	<0.050
	Potassium (K)-Total (mg/L)	7.24	4.90	<0.10	3.39	15.7
	Selenium (Se)-Total (mg/L)	0.000226	0.000153	<0.000050	0.000130	0.000064
	Silicon (Si)-Total (mg/L)	7.52	28.9	<0.050	7.73	2.90
	Silver (Ag)-Total (mg/L)	0.000029	0.000946	<0.000010	0.000044	0.000260
	Sodium (Na)-Total (mg/L)	34.8	5.96	<0.050	7.36	14.0
	Strontium (Sr)-Total (mg/L)	0.702	0.380	<0.00020	0.533	0.543
	Sulfur (S)-Total (mg/L)	224	71.0	<0.50	179	228
	Thallium (Tl)-Total (mg/L)	0.000010	0.000136	<0.000010	0.000022	0.000221
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	0.00121	0.0926	<0.00030	0.0448	0.00032
	Uranium (U)-Total (mg/L)	0.00181	0.00172	<0.000010	0.00244	0.000917
	Vanadium (V)-Total (mg/L)	0.00219	0.0205	<0.00050	0.00562	<0.00050
	Zinc (Zn)-Total (mg/L)	0.0174	0.141	<0.0030	0.0203	0.0443
	Zirconium (Zr)-Total (mg/L)	0.00063	0.00069	<0.00030	<0.00030	<0.00030
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD		FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD		FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0080	0.0070		0.0155	0.0124
	Antimony (Sb)-Dissolved (mg/L)	0.00036	0.00230		0.00205	0.0352
	Arsenic (As)-Dissolved (mg/L)	0.0271	0.0213		0.00530	0.0762
	Barium (Ba)-Dissolved (mg/L)	0.0437	0.0890		0.0659	0.0104
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020		<0.000020	<0.000020
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050		<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)	0.046	<0.010		0.018	0.061
	Cadmium (Cd)-Dissolved (mg/L)	0.0000970	0.000102		0.0000101	0.000550
	Calcium (Ca)-Dissolved (mg/L)	240	85.3		168	214
	Chromium (Cr)-Dissolved (mg/L)	0.00032	<0.00010		<0.00010	<0.00010
	Cobalt (Co)-Dissolved (mg/L)	0.00503	0.00057		0.00038	0.00030
	Copper (Cu)-Dissolved (mg/L)	0.00177	0.00121		0.00065	0.0182
	Iron (Fe)-Dissolved (mg/L)	6.10	0.018		0.129	<0.010
	Lead (Pb)-Dissolved (mg/L)	<0.000050	0.000121		<0.000050	0.000511
	Lithium (Li)-Dissolved (mg/L)	<0.0010	0.0021		0.0039	0.0081

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1808128-6	L1808128-7	L1808128-8	L1808128-9	L1808128-10
		Description	Water	Water	Water	Water	Water
		Sampled Date	02-AUG-16	02-AUG-16	02-AUG-16	02-AUG-16	01-AUG-16
		Sampled Time	11:15	09:00	08:31	12:30	14:45
		Client ID	WQ-VC-DBC	WQ-VC-UMN-R	WQ-VC-UMN	WQ-VC-U	WQ-VC-R
Grouping	Analyte						
WATER							
Total Metals	Magnesium (Mg)-Total (mg/L)		7.93	9.31	9.17	7.22	8.36
	Manganese (Mn)-Total (mg/L)		0.0813	0.0784	0.0752	0.0246	0.115
	Mercury (Hg)-Total (mg/L)		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Molybdenum (Mo)-Total (mg/L)		0.000467	0.000454	0.000486	0.000354	0.000583
	Nickel (Ni)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	0.00115
	Phosphorus (P)-Total (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)		0.78	0.82	0.84	0.64	1.09
	Selenium (Se)-Total (mg/L)		0.000062	0.000061	0.000057	<0.000050	0.000081
	Silicon (Si)-Total (mg/L)		6.58	6.60	6.56	6.14	8.18
	Silver (Ag)-Total (mg/L)		0.000016	0.000014	0.000017	<0.000010	0.000088
	Sodium (Na)-Total (mg/L)		2.40	2.80	2.72	2.23	2.66
	Strontium (Sr)-Total (mg/L)		0.247	0.264	0.259	0.240	0.234
	Sulfur (S)-Total (mg/L)		7.15	11.0	10.9	4.69	10.0
	Thallium (Tl)-Total (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	0.000025
	Tin (Sn)-Total (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)		0.00500	0.00450	0.00516	0.00071	0.0314
	Uranium (U)-Total (mg/L)		0.000591	0.000620	0.000600	0.000363	0.000785
	Vanadium (V)-Total (mg/L)		0.00088	0.00079	0.00082	<0.00050	0.00288
	Zinc (Zn)-Total (mg/L)		0.0046	0.0046	0.0047	<0.0030	0.0129
	Zirconium (Zr)-Total (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	0.00038
Dissolved Metals	Dissolved Mercury Filtration Location		FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location		FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)		0.0209	0.0195	0.0191	0.0244	0.0302
	Antimony (Sb)-Dissolved (mg/L)		0.00016	0.00021	0.00020	<0.00010	0.00022
	Arsenic (As)-Dissolved (mg/L)		0.00065	0.00095	0.00093	0.00033	0.00112
	Barium (Ba)-Dissolved (mg/L)		0.0603	0.0608	0.0610	0.0615	0.0583
	Beryllium (Be)-Dissolved (mg/L)		<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Bismuth (Bi)-Dissolved (mg/L)		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)		<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)		0.0000177	0.0000214	0.0000201	0.0000133	0.0000256
	Calcium (Ca)-Dissolved (mg/L)		24.0	28.6	26.6	20.5	24.5
	Chromium (Cr)-Dissolved (mg/L)		0.00011	0.00011	0.00011	0.00012	0.00013
	Cobalt (Co)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	0.00013
	Copper (Cu)-Dissolved (mg/L)		0.00133	0.00134	0.00141	0.00132	0.00164
	Iron (Fe)-Dissolved (mg/L)		0.059	0.059	0.058	0.054	0.088
	Lead (Pb)-Dissolved (mg/L)		<0.000050	0.000054	0.000061	<0.000050	0.000170
	Lithium (Li)-Dissolved (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1808128-11	L1808128-12	L1808128-13	L1808128-14	L1808128-15
		Description	Water	Water	Water	Water	Water
		Sampled Date	01-AUG-16	01-AUG-16	03-AUG-16	03-AUG-16	03-AUG-16
		Sampled Time	16:40	18:05	11:35	10:10	09:00
		Client ID	WQ-DC-R	WQ-DC-U	WQ-CH-P-13-01	WQ-DC-D1B	FIELD BLANK
Grouping	Analyte						
WATER							
Total Metals	Magnesium (Mg)-Total (mg/L)		45.1	61.8	76.3	96.0	<0.10
	Manganese (Mn)-Total (mg/L)		0.448	1.27	0.162	1.12	<0.00010
	Mercury (Hg)-Total (mg/L)		<0.0000050	<0.0000050	<0.0000050	0.0000092	<0.0000050
	Molybdenum (Mo)-Total (mg/L)		0.000356	0.000466	<0.000050	0.000427	<0.000050
	Nickel (Ni)-Total (mg/L)		0.00099	0.00155	0.00642	0.00454	<0.00050
	Phosphorus (P)-Total (mg/L)		<0.050	<0.050	<0.050	0.209	<0.050
	Potassium (K)-Total (mg/L)		2.61	3.56	0.44	4.40	<0.10
	Selenium (Se)-Total (mg/L)		0.000103	0.000122	<0.000050	0.000241	<0.000050
	Silicon (Si)-Total (mg/L)		6.09	6.70	8.15	11.9	<0.050
	Silver (Ag)-Total (mg/L)		<0.000010	0.000017	<0.000010	0.000208	<0.000010
	Sodium (Na)-Total (mg/L)		9.73	11.8	5.28	6.99	<0.050
	Strontium (Sr)-Total (mg/L)		0.423	0.532	0.479	0.555	<0.00020
	Sulfur (S)-Total (mg/L)		119	165	279	210	<0.50
	Thallium (Tl)-Total (mg/L)		<0.000010	0.000010	<0.000010	0.000103	<0.000010
	Tin (Sn)-Total (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)		0.00105	0.0180	0.00037	0.170	<0.00030
	Uranium (U)-Total (mg/L)		0.00122	0.00180	0.000013	0.00400	<0.000010
	Vanadium (V)-Total (mg/L)		0.00069	0.00288	<0.00050	0.0154	<0.00050
	Zinc (Zn)-Total (mg/L)		0.0059	0.0105	3.09	0.280	<0.0030
	Zirconium (Zr)-Total (mg/L)		<0.00030	<0.00030	<0.00030	0.00038	<0.00030
Dissolved Metals	Dissolved Mercury Filtration Location		FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location		FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)		0.0149	0.0299	0.152	0.0066	<0.0010
	Antimony (Sb)-Dissolved (mg/L)		0.00116	0.00138	0.00011	0.00634	<0.00010
	Arsenic (As)-Dissolved (mg/L)		0.00696	0.0118	0.00047	0.0165	<0.00010
	Barium (Ba)-Dissolved (mg/L)		0.0492	0.0591	0.0104	0.0498	<0.000050
	Beryllium (Be)-Dissolved (mg/L)		<0.000020	<0.000020	0.000032	<0.000020	<0.000020
	Bismuth (Bi)-Dissolved (mg/L)		<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)		0.017	0.022	<0.010	0.038	<0.010
	Cadmium (Cd)-Dissolved (mg/L)		0.0000335	0.0000189	0.00827	0.0000875	<0.0000050
	Calcium (Ca)-Dissolved (mg/L)		123	165	213	211	<0.050
	Chromium (Cr)-Dissolved (mg/L)		0.00022	0.00015	0.00011	<0.00010	<0.00010
	Cobalt (Co)-Dissolved (mg/L)		0.00088	0.00134	<0.00010	0.00042	<0.00010
	Copper (Cu)-Dissolved (mg/L)		0.00132	0.00148	0.00096	0.00064	<0.00020
	Iron (Fe)-Dissolved (mg/L)		0.415	0.229	0.031	0.443	<0.010
	Lead (Pb)-Dissolved (mg/L)		<0.000050	0.000320	<0.000050	<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)		0.0020	0.0027	0.0017	0.0077	<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		L1808128-16 Water 03-AUG-16 08:50 WQ-DC-DX-105-R	L1808128-17 Water 03-AUG-16 11:50 WQ-DESS-02	L1808128-18 Water 03-AUG-16 11:15 WQ-DESS-01	L1808128-19 Water 03-AUG-16 08:45 WQ-DC-DX-105	L1808128-20 Water 03-AUG-16 08:28 WQ-DC-DX
Grouping	Analyte					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	59.7	62.0	46.6	59.7	21.6
	Manganese (Mn)-Total (mg/L)	1.13	0.0188	0.0462	1.12	0.283
	Mercury (Hg)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	0.000070
	Molybdenum (Mo)-Total (mg/L)	0.000316	0.00015	0.000057	0.000326	0.000059
	Nickel (Ni)-Total (mg/L)	0.00118	<0.0010 ^{DLA}	0.00410	0.00119	0.00080
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	3.57	0.64	0.29	3.53	4.56
	Selenium (Se)-Total (mg/L)	<0.000050	0.00026	0.000067	<0.000050	0.000083
	Silicon (Si)-Total (mg/L)	6.91	6.30 ^{DLA}	7.92	6.85	6.23
	Silver (Ag)-Total (mg/L)	<0.000010	<0.000020 ^{DLA}	0.000014	<0.000010	0.000048
	Sodium (Na)-Total (mg/L)	5.05	7.90	4.01	5.05	4.00
	Strontium (Sr)-Total (mg/L)	0.422	0.698	0.317	0.408	0.242
	Sulfur (S)-Total (mg/L)	138	327 ^{DLA}	168	137	64.1
	Thallium (Tl)-Total (mg/L)	0.000104	<0.000020 ^{DLA}	<0.000010	0.000104	0.000030
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00020 ^{DLA}	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.00030	0.00339	0.00217	<0.00030	0.0364
	Uranium (U)-Total (mg/L)	0.00435	0.00168	0.000014	0.00419	0.000193
	Vanadium (V)-Total (mg/L)	<0.00050	<0.0010 ^{DLA}	0.00055	<0.00050	0.00340
	Zinc (Zn)-Total (mg/L)	0.604	<0.0060 ^{DLA}	1.79	0.617	0.0094
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00060 ^{DLA}	<0.00030	<0.00030	<0.00030
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	<0.0010	0.0133	0.105	0.0012	0.0080
	Antimony (Sb)-Dissolved (mg/L)	0.00910	0.00023	0.00018	0.00935	0.00085
	Arsenic (As)-Dissolved (mg/L)	0.00785	0.00247	0.00066	0.00868	0.00941
	Barium (Ba)-Dissolved (mg/L)	0.0136	0.0243	0.0198	0.0138	0.0448
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000040 ^{DLA}	<0.000020	<0.000020	<0.000020
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.00010 ^{DLA}	<0.000050	<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)	<0.010	<0.020 ^{DLA}	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.000630	0.000066	0.00404	0.000642	0.0000200
	Calcium (Ca)-Dissolved (mg/L)	184	372 ^{DLA}	148	185	80.9
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00020 ^{DLA}	0.00014	<0.00010	<0.00010
	Cobalt (Co)-Dissolved (mg/L)	0.00073	<0.00020 ^{DLA}	0.00018	0.00072	0.00050
	Copper (Cu)-Dissolved (mg/L)	<0.00020	0.00047	0.00152	<0.00020	0.00119
	Iron (Fe)-Dissolved (mg/L)	0.099	<0.010 ^{DLA}	0.092	0.098	0.898
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.00010 ^{DLA}	<0.000050	<0.000050	0.000078
	Lithium (Li)-Dissolved (mg/L)	0.0084	<0.0020 ^{DLA}	0.0011	0.0076	<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	L1808128-21 Water 03-AUG-16 12:54 WQ-PC-D	L1808128-22 Water 03-AUG-16 15:15 WQ-BC		
Grouping	Analyte				
WATER					
Total Metals	Magnesium (Mg)-Total (mg/L)	18.9	13.0		
	Manganese (Mn)-Total (mg/L)	1.24	0.583		
	Mercury (Hg)-Total (mg/L)	0.0000280	0.0000137		
	Molybdenum (Mo)-Total (mg/L)	0.00104	0.00126		
	Nickel (Ni)-Total (mg/L)	0.00231	0.00180		
	Phosphorus (P)-Total (mg/L)	0.150	0.059		
	Potassium (K)-Total (mg/L)	2.95	1.76		
	Selenium (Se)-Total (mg/L)	0.000132	0.000123		
	Silicon (Si)-Total (mg/L)	15.2	10.6		
	Silver (Ag)-Total (mg/L)	0.000570	0.000207		
	Sodium (Na)-Total (mg/L)	6.21	4.22		
	Strontium (Sr)-Total (mg/L)	0.439	0.331		
	Sulfur (S)-Total (mg/L)	80.5	34.3		
	Thallium (Tl)-Total (mg/L)	0.000077	0.000046		
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010		
	Titanium (Ti)-Total (mg/L)	0.0595	0.0576		
	Uranium (U)-Total (mg/L)	0.00201	0.00203		
	Vanadium (V)-Total (mg/L)	0.0118	0.00614		
	Zinc (Zn)-Total (mg/L)	0.0835	0.0313		
	Zirconium (Zr)-Total (mg/L)	0.00097	0.00039		
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD		
	Dissolved Metals Filtration Location	FIELD	FIELD		
	Aluminum (Al)-Dissolved (mg/L)	0.0099	0.0251		
	Antimony (Sb)-Dissolved (mg/L)	0.00245	0.00095		
	Arsenic (As)-Dissolved (mg/L)	0.0187	0.00467		
	Barium (Ba)-Dissolved (mg/L)	0.0971	0.0653		
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020		
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050		
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010		
	Cadmium (Cd)-Dissolved (mg/L)	0.000163	0.0000629		
	Calcium (Ca)-Dissolved (mg/L)	99.1	58.2		
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	0.00012		
	Cobalt (Co)-Dissolved (mg/L)	0.00061	0.00034		
	Copper (Cu)-Dissolved (mg/L)	0.00196	0.00182		
	Iron (Fe)-Dissolved (mg/L)	0.012	0.033		
	Lead (Pb)-Dissolved (mg/L)	0.000147	0.000137		
	Lithium (Li)-Dissolved (mg/L)	0.0023	0.0016		

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1808128-1	L1808128-2	L1808128-3	L1808128-4	L1808128-5
		Description	Water	Water	Water	Water	Water
		Sampled Date	02-AUG-16	02-AUG-16	03-AUG-16	02-AUG-16	02-AUG-16
		Sampled Time	17:10	16:00		18:25	18:00
		Client ID	WQ-SEEP	WQ-PC-U	TRAVEL BLANK	WQ-DC-B	WQ-TP
Grouping	Analyte						
WATER							
Dissolved Metals	Magnesium (Mg)-Dissolved (mg/L)		56.5	17.1		79.3	42.9
	Manganese (Mn)-Dissolved (mg/L)		3.39	1.11		0.571	0.0424
	Mercury (Hg)-Dissolved (mg/L)		<0.0000050	<0.0000050		<0.0000050	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)		0.000816	0.000754		0.000350	0.00124
	Nickel (Ni)-Dissolved (mg/L)		0.00159	<0.00050		0.00069	<0.00050
	Phosphorus (P)-Dissolved (mg/L)		<0.050	<0.050		<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)		7.36	2.40		3.39	15.9
	Selenium (Se)-Dissolved (mg/L)		0.000152	0.000069		0.000083	<0.000050
	Silicon (Si)-Dissolved (mg/L)		7.28	6.53		6.27	2.83
	Silver (Ag)-Dissolved (mg/L)		<0.000010	<0.000010		<0.000010	0.000057
	Sodium (Na)-Dissolved (mg/L)		23.4	5.54		7.34	13.4
	Strontium (Sr)-Dissolved (mg/L)		0.642	0.370		0.529	0.529
	Sulfur (S)-Dissolved (mg/L)		210	70.7		176	218
	Thallium (Tl)-Dissolved (mg/L)		<0.000010	<0.000010		<0.000010	0.000218
	Tin (Sn)-Dissolved (mg/L)		<0.00010	<0.00010		<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)		0.00051	<0.00030		<0.00030	<0.00030
	Uranium (U)-Dissolved (mg/L)		0.00162	0.00140		0.00219	0.000866
	Vanadium (V)-Dissolved (mg/L)		0.00100	0.00057		<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)		0.0099	0.0042		0.0033	0.0256
	Zirconium (Zr)-Dissolved (mg/L)		0.00051	<0.00030		<0.00030	<0.00030

* 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	L1808128-6 Water 02-AUG-16 11:15 WQ-VC-DBC	L1808128-7 Water 02-AUG-16 09:00 WQ-VC-UMN-R	L1808128-8 Water 02-AUG-16 08:31 WQ-VC-UMN	L1808128-9 Water 02-AUG-16 12:30 WQ-VC-U	L1808128-10 Water 01-AUG-16 14:45 WQ-VC-R
Grouping	Analyte					
WATER						
Dissolved Metals	Magnesium (Mg)-Dissolved (mg/L)	7.79	8.94	8.82	7.00	7.93
	Manganese (Mn)-Dissolved (mg/L)	0.0706	0.0659	0.0664	0.0215	0.0772
	Mercury (Hg)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.000456	0.000446	0.000449	0.000345	0.000530
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	0.71	0.75	0.74	0.60	0.73
	Selenium (Se)-Dissolved (mg/L)	<0.000050	0.000054	0.000058	<0.000050	0.000053
	Silicon (Si)-Dissolved (mg/L)	6.33	6.23	6.21	6.08	6.28
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	2.34	2.64	3.22	2.18	2.65
	Strontium (Sr)-Dissolved (mg/L)	0.243	0.252	0.253	0.238	0.234
	Sulfur (S)-Dissolved (mg/L)	7.03	10.5	10.6	4.48	9.69
	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)	<0.00030	<0.00030	<0.00030	<0.00030	0.00032
	Uranium (U)-Dissolved (mg/L)	0.000562	0.000572	0.000573	0.000344	0.000691
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)	<0.0010	0.0017	0.0017	0.0013	0.0012
	Zirconium (Zr)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID	L1808128-11	L1808128-12	L1808128-13	L1808128-14	L1808128-15
		Description	Water	Water	Water	Water	Water
		Sampled Date	01-AUG-16	01-AUG-16	03-AUG-16	03-AUG-16	03-AUG-16
		Sampled Time	16:40	18:05	11:35	10:10	09:00
		Client ID	WQ-DC-R	WQ-DC-U	WQ-CH-P-13-01	WQ-DC-D1B	FIELD BLANK
Grouping	Analyte						
WATER							
Dissolved Metals	Magnesium (Mg)-Dissolved (mg/L)		47.3	65.0	77.7	97.7	<0.10
	Manganese (Mn)-Dissolved (mg/L)		0.437	1.22	0.147	0.947	0.00013
	Mercury (Hg)-Dissolved (mg/L)		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)		0.000327	0.000450	<0.000050	0.000286	<0.000050
	Nickel (Ni)-Dissolved (mg/L)		0.00078	0.00084	0.00591	<0.00050	<0.00050
	Phosphorus (P)-Dissolved (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)		2.56	3.57	0.45	4.14	<0.10
	Selenium (Se)-Dissolved (mg/L)		0.000080	0.000086	0.000055	0.000051	<0.000050
	Silicon (Si)-Dissolved (mg/L)		6.20	6.20	8.23	6.06	<0.050
	Silver (Ag)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)		9.86	11.7	5.17	6.75	<0.050
	Strontium (Sr)-Dissolved (mg/L)		0.410	0.527	0.467	0.556	<0.00020
	Sulfur (S)-Dissolved (mg/L)		116	161	269	207	<0.50
	Thallium (Tl)-Dissolved (mg/L)		<0.000010	<0.000010	<0.000010	0.000013	<0.000010
	Tin (Sn)-Dissolved (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)		0.00040	0.00034	<0.00030	<0.00030	<0.00030
	Uranium (U)-Dissolved (mg/L)		0.00117	0.00171	<0.000010	0.00319	<0.000010
	Vanadium (V)-Dissolved (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)		0.0033	0.0023	3.08	0.0946	<0.0010
	Zirconium (Zr)-Dissolved (mg/L)		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030

* 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	L1808128-16 Water 03-AUG-16 08:50 WQ-DC-DX-105-R	L1808128-17 Water 03-AUG-16 11:50 WQ-DESS-02	L1808128-18 Water 03-AUG-16 11:15 WQ-DESS-01	L1808128-19 Water 03-AUG-16 08:45 WQ-DC-DX-105	L1808128-20 Water 03-AUG-16 08:28 WQ-DC-DX	
Grouping	Analyte					
WATER						
Dissolved Metals	Magnesium (Mg)-Dissolved (mg/L)	59.6	61.6	49.5	58.6	21.0 ^{DTC}
	Manganese (Mn)-Dissolved (mg/L)	1.10	0.00363	0.0467	1.12	0.404
	Mercury (Hg)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.000289	0.00015	<0.000050	0.000304	0.000057
	Nickel (Ni)-Dissolved (mg/L)	0.00116	<0.0010 ^{DLA}	0.00394	0.00119	<0.00050
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	3.49	0.65	0.31	3.47	4.51
	Selenium (Se)-Dissolved (mg/L)	<0.000050	0.00026	0.000052	<0.000050	0.000054
	Silicon (Si)-Dissolved (mg/L)	6.81	6.21	8.31	6.81	5.13
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000020 ^{DLA}	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	4.95	7.92	4.07	5.04	3.85
	Strontium (Sr)-Dissolved (mg/L)	0.407	0.695	0.332	0.401	0.244
	Sulfur (S)-Dissolved (mg/L)	133	321	174	131	61.1
	Thallium (Tl)-Dissolved (mg/L)	0.000093	<0.000020 ^{DLA}	<0.000010	0.000093	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00020 ^{DLA}	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	<0.00030	<0.00060 ^{DLA}	0.00070	<0.00030	<0.00030
	Uranium (U)-Dissolved (mg/L)	0.00420	0.00168	0.000011	0.00406	0.000132
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.0010 ^{DLA}	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)	0.598	0.0023	1.86	0.606	0.0027
	Zirconium (Zr)-Dissolved (mg/L)	<0.00030	<0.00060 ^{DLA}	<0.00030	<0.00030	<0.00030

* 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	L1808128-21 Water 03-AUG-16 12:54 WQ-PC-D	L1808128-22 Water 03-AUG-16 15:15 WQ-BC		
Grouping	Analyte				
WATER					
Dissolved Metals	Magnesium (Mg)-Dissolved (mg/L)	18.8	13.0		
	Manganese (Mn)-Dissolved (mg/L)	1.14	0.538		
	Mercury (Hg)-Dissolved (mg/L)	<0.000050	<0.000050		
	Molybdenum (Mo)-Dissolved (mg/L)	0.000917	0.00122		
	Nickel (Ni)-Dissolved (mg/L)	0.00077	<0.00050		
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050		
	Potassium (K)-Dissolved (mg/L)	2.27	1.30		
	Selenium (Se)-Dissolved (mg/L)	0.000093	0.000081		
	Silicon (Si)-Dissolved (mg/L)	6.17	6.41		
	Silver (Ag)-Dissolved (mg/L)	<0.000010	0.000011		
	Sodium (Na)-Dissolved (mg/L)	6.31	4.39		
	Strontium (Sr)-Dissolved (mg/L)	0.431	0.345		
	Sulfur (S)-Dissolved (mg/L)	83.3	35.1		
	Thallium (Tl)-Dissolved (mg/L)	0.000012	0.000011		
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010		
	Titanium (Ti)-Dissolved (mg/L)	<0.00030	0.00036		
	Uranium (U)-Dissolved (mg/L)	0.00179	0.00197		
	Vanadium (V)-Dissolved (mg/L)	0.00061	0.00081		
	Zinc (Zn)-Dissolved (mg/L)	0.0151	0.0015		
	Zirconium (Zr)-Dissolved (mg/L)	<0.00030	<0.00030		

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Bismuth (Bi)-Total	DLA	L1808128-10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -20, -21, -22, -8, -9
Duplicate	Lead (Pb)-Total	DLA	L1808128-10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -20, -21, -22, -8, -9
Duplicate	Tin (Sn)-Total	DLA	L1808128-10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -20, -21, -22, -8, -9
Duplicate	Titanium (Ti)-Total	DLA	L1808128-10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -20, -21, -22, -8, -9
Duplicate	Zinc (Zn)-Total	DLA	L1808128-10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -20, -21, -22, -8, -9
Duplicate	Zirconium (Zr)-Total	DLA	L1808128-10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -20, -21, -22, -8, -9
Duplicate	Cadmium (Cd)-Total	DLM	L1808128-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Sulfate (SO4)	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Iron (Fe)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Uranium (U)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Cadmium (Cd)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	-2, -20, -21, -22, -4, -5, -6, -7, -8, -9 L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Zinc (Zn)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Aluminum (Al)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Arsenic (As)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Uranium (U)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Aluminum (Al)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1808128-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -4, -5, -6, -7, -8, -9

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
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-TITR-VA	Water	Alkalinity Species by Titration	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
BE-D-L-CCMS-VA	Water	Diss. Be (low) in Water by CRC ICPMS	APHA 3030B/6020A (mod)
Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
BE-T-L-CCMS-VA	Water	Total Be (Low) in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
CL-IC-N-WR	Water	Chloride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
CN-CNO-WT	Water	Cyanate	APHA 4500-CN-L
This analysis is carried out using procedures adapted from APHA method 4500-CN "Cyanide". Cyanate is determined by the Cyanate hydrolysis method using an ammonia selective electrode			
CN-SCN-VA	Water	Thiocyanate by Colour	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN- M "Thiocyanate" Thiocyanate is determined by the ferric nitrate colourimetric method.			
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002
This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.			
CN-WAD-CFA-VA	Water	Weak Acid Diss. Cyanide in water by CFA	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN I. "Weak Acid Dissociable Cyanide". Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.			

Reference Information

EC-PCT-VA	Water	Conductivity (Automated)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
F-IC-N-WR	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B
Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.			
HG-D-CVAA-VA	Water	Diss. Mercury in Water by CVAAS or CVAFS	APHA 3030B/EPA 1631E (mod)
Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.			
HG-T-CVAA-VA	Water	Total Mercury in Water by CVAAS or CVAFS	EPA 1631E (mod)
Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS.			
IONBALANCE-VA	Water	Ion Balance Calculation	APHA 1030E
Cation Sum, Anion Sum, and Ion Balance (as % difference) are calculated based on guidance from APHA Standard Methods (1030E Checking Correctness of Analysis). Because all aqueous solutions are electrically neutral, the calculated ion balance (% difference of cations minus anions) should be near-zero.			
Cation and Anion Sums are the total meq/L concentration of major cations and anions. Dissolved species are used where available. Minor ions are included where data is present. Ion Balance is calculated as:			
Ion Balance (%) = [Cation Sum-Anion Sum] / [Cation Sum+Anion Sum]			
MET-D-CCMS-VA	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)
Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
MET-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	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
MET-TOT-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	APHA 4500 NH ₃ -NITROGEN (AMMONIA)
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
NH3-F-VA	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
NO2-L-IC-N-WR	Water	Nitrite in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-L-IC-N-WR	Water	Nitrate in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"

Reference Information

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

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

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

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

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

S-DIS-ICP-VA Water Dissolved 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.

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.

SO4-IC-N-WR Water Sulfate in Water by IC EPA 300.1 (mod)

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

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

This analysis is carried out using procedures adapted from APHA 1030E "Checking Correctness of Analyses".

TSS-MAN-WR Water Total Suspended Solids by Gravimetric APHA 2540 D

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

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

Chain of Custody Numbers:

1	2	3	4
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Reference Information

GLOSSARY OF REPORT TERMS

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

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

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

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

mg/L - milligrams per litre.

< - Less than.

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

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

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

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

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



ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L1808128-COFC

Number: 14 -

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

Invoice To		Invoice Distribution		Analysis Request													Number of Containers									
Same as Report To	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Select Invoice Distribution:	<input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) below																						
Copy of Invoice with Report	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Email 1 or Fax:	sjenner@edynamics.com																							
Company:	EDI	Email 2:	ldoetzel@edynamics.com																							
Contact:	S Jenner	Oil and Gas Required Fields (client use)																								
Project Information		Approver ID:		Cost Center:		Routing Code:																				
ALS Quote #:	Q55559	GL Account:																								
Job #:	MOUNT NANSEN 16-Y-0089	Activity Code:																								
PO / AFE:		Location:																								
LSD:		ALS Contact:	Sean Slugget	Sampler:																						

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA-EC-PCT-VA-PHPCT-VA	ANTONS-ALL-IC-WR-TSS-MAN-WR	CN-WAD-CFA-VA-CNT-CFA-VA	CN-CNO-WT	CN-SCN-VA	NHS-F-VA	MET-T-BCMDG-VA	MET-D-BCMDG-VA	IONBALANC-VA-TDS-CALC-VA														
1	WG-SEEP	02 -Aug-16	17:10	Water	R	R	R	R	R	R	R	R	R														
2	WG-PC-U	02 -Aug-16	16:00	Water	R	R	R	R	R	R	R	R	R														
3	TRAVEL BLANK	-Aug-16	-	Water	R	R	R	R	R	R	R	R	R														
4	WG-DC-B	02 -Aug-16	18:25	Water	R	R	R	R	R	R	R	R	R														
5	WG-TP	02 -Aug-16	18:00	Water	R	R	R	R	R	R	R	R	R														
6	WG-VC-DBC	02 -Aug-16	11:15	Water	R	R	R	R	R	R	R	R	R														
7	WG-VC-UMN-r	02 -Aug-16	09:00	Water	R	R	R	R	R	R	R	R	R														

Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report (client use)		SAMPLE CONDITION AS RECEIVED (lab use only)			
Are samples taken from a Regulated DW System?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Frozen	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	SIF Observations	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Are samples for human drinking water use?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			ice packs	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Custody seal intact	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
				Cooling Initiated	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
				INITIAL COOLER TEMPERATURES °C: 7.7, 9.6, 7.2, 8.0, 8.6			
				FINAL COOLER TEMPERATURES °C: 10°C			

SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)		FINAL SHIPMENT RECEPTION (lab use only)	
Released by:	Date:	Time:	Received by:	Date:	Time:
			<i>[Signature]</i>	Aug 13 2016	7:50 AM
				Received by:	Date:
				<i>[Signature]</i>	2-25

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



ALS Environmental

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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L1808128-COFC

OC Number: 14 -

Page ___ of ___

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

Invoice To	Invoice Distribution	Analysis Request																				
Same as Report To <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																				
Copy of Invoice with Report <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Email 1 or Fax: sjenner@edynamics.com																					
Company: EDI	Email 2: ldoetzel@edynamics.com																					
Contact: S Jenner	Oil and Gas Required Fields (client use)																					
ALS Quote #: Q55559	Approver ID:	Cost Center:																				
Job #: MOUNT NANSEN 16-Y-0089	GI Account:	Routing Code:																				
PO / AFE:	Activity Code:																					
LSD:	Location:																					
ALS Lab Work Order # (lab use only)	ALS Contact: Sean Slugget	Sampler:																				

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA-EC-PCT-VA-PH-PCT-VA	ANIONS-ALL-IC-WR-TSS-MAN-WR	CN-WAD-CFA-VA-CN-T-CFA-VA	CN-CNO-WT	CN-SON-VA	NH-F-VA	MET-T-BCMDG-VA	MET-D-BCMDG-VA	IONBALANC-VA-TDS-CALC-VA	Number of Containers
9	WB-VC-UMM	02-Aug-16	08:31	Water	R	R	R	R	R	R	R	R	R	9
9	WB-VC-U	02-Aug-16	12:30	Water	R	R	R	R	R	R	R	R	R	9
10	WA-VC-R	01-Aug-16	14:45	Water	R	R	R	R	R	R	R	R	R	9
11	WA-DC-R	01-Aug-16	16:40	Water	R	R	R	R	R	R	R	R	R	9
12	WA-DC-U	01-Aug-16	18:05	Water	R	R	R	R	R	R	R	R	R	9
13	WA-CH-P-13-01	03-Aug-16	11:35	Water	R	R	R	R	R	R	R	R	R	9
14	WA-DC-D16	03-Aug-16	10:10	Water	R	R	R	R	R	R	R	R	R	9

Drinking Water (DW) Samples¹ (client use)	Special Instructions / Specify Criteria to add on report (client Use)	SAMPLE CONDITION AS RECEIVED (lab use only)
Are samples taken from a Regulated DW System? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>
Are samples for human drinking water use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Ice packs Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>
		Cooling initiated <input checked="" type="checkbox"/>
		INITIAL COOLER TEMPERATURES °C: 19.6, 7.0, 7.0, 8.0, 8.6
		FINAL COOLER TEMPERATURES °C: 10°C

SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)		FINAL SHIPMENT RECEPTION (lab use only)	
Released by:	Date:	Time:	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION
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DC Number: 14 -

Page ___ of ___

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

Invoice To	Invoice Distribution	Analysis Request													
Same as Report To <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below													
Copy of Invoice with Report <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Email 1 or Fax: sljenner@edynamics.com														
Company: EDI	Email 2: ldoetzel@edynamics.com														
Contact: S Jenner															
Project Information		Oil and Gas Required Fields (client use)													
ALS Quote #: Q55559	Approver ID:	AL-K-PCT-VA, EC-PCT-VA, PH-PCT-VA	ANIONS-ALL-IC-WR, TSS-MAN-WR	CN-WAD-CFA-VA, CN-T-CFA-VA	CN-CNO-WT	CN-SCN-VA	NHS-F-VA	MET-T-BCMDG-VA	MET-D-BCMDG-VA	IONBALANC-VA, TDS-CALC-VA					
Job #: MOUNT NANSEN 16-Y-0089	GL Account:														
PO / AFE:	Routing Code:														
LSD:	Activity Code:														
	Location:														

ALS Lab Work Order # (lab use only)	ALS Contact: Sean Slugget	Sampler:														Number of Containers				
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mm-yy)	Time (hh:mm)	Sample Type															
15			03	09:00	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9
16			03	08:50	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9
17			03	11:50	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9
18			03	11:15	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9
19			03	08:45	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9
20			03	08:28	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9
21			03	12:54	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9

Drinking Water (DW) Samples (client use)	Special Instructions / Specify Criteria to add on report (client use)	SAMPLE CONDITION AS RECEIVED (lab use only)
Are samples taken from a Regulated DW System? <input type="checkbox"/> Yes <input type="checkbox"/> No		Frozen: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No SIF Observations: Yes <input type="checkbox"/> No <input type="checkbox"/> Ice packs: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Custody seal intact: Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling initiated: <input checked="" type="checkbox"/>
Are samples for human drinking water use? <input type="checkbox"/> Yes <input type="checkbox"/> No		INITIAL COOLER TEMPERATURES °C: 9.6, 7.6, 8.0, 8.6 FINAL COOLER TEMPERATURES °C: 10.0

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)				FINAL SHIPMENT RECEPTION (lab use only)				
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
			<i>[Signature]</i>	Aug-16	7:54	<i>[Signature]</i>	Aug-16	2:28			

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 Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.
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DC Number: 14 -

Page 2 of 2

Report To Company: EDI Contact: Lyndsay Doetzel Address: 2195 - 2nd Avenue Whitehorse, YT Y1A 3T8 Phone: 867-393-4882	Report Format / Distribution Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax lidoetzel@edynamics.com Email 2 Emilie.Hamm@gov.yk.ca Email 3 erik.pjt@gov.yk.ca	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests) R <input checked="" type="checkbox"/> Regular (Standard TAT if received by 3 pm - business days) P <input type="checkbox"/> Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT E <input type="checkbox"/> Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 <input type="checkbox"/> Same day or weekend emergency - contact ALS to confirm TAT and surcharge Specify Date Required for E2,E or P: _____																																																																																																																																																																																									
Invoice To Same as Report To <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No Copy of Invoice with Report <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Company: EDI Contact: S Jenner ALS Quote #: Q55559 Job #: MOUNT NANSEN 16-Y-0089 PO / AFE: LSD:	Invoice Distribution Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax sjenner@edynamics.com Email 2 lidoetzel@edynamics.com Oil and Gas Required Fields (client use) Approver ID: Cost Center: GL Account: Routing Code: Activity Code: Location:	Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																																																																																																																																																																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>ALS Sample # (lab use only)</th> <th>Sample Identification and/or Coordinates (This description will appear on the report)</th> <th>Date (dd-mmm-yy)</th> <th>Time (hh:mm)</th> <th>Sample Type</th> <th colspan="11">Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below</th> <th rowspan="2" style="writing-mode: vertical-rl; text-orientation: mixed;">Number of Containers</th> </tr> </thead> <tbody> <tr> <td>22</td> <td>WA-BC</td> <td>03-Aug-16</td> <td>15:15</td> <td>Water</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>9</td> </tr> <tr> <td></td> <td></td> <td>-Aug-16</td> <td></td> <td>Water</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>9</td> </tr> <tr> <td></td> <td></td> <td>-Aug-16</td> <td></td> <td>Water</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>9</td> </tr> <tr> <td></td> <td></td> <td>-Aug-16</td> <td></td> <td>Water</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>9</td> </tr> <tr> <td></td> <td></td> <td>-Aug-16</td> <td></td> <td>Water</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>9</td> </tr> <tr> <td></td> <td></td> <td>-Aug-16</td> <td></td> <td>Water</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>9</td> </tr> <tr> <td></td> <td></td> <td>-Aug-16</td> <td></td> <td>Water</td> <td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>R</td><td>9</td> </tr> </tbody> </table>			ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below											Number of Containers	22	WA-BC	03-Aug-16	15:15	Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9			-Aug-16		Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9			-Aug-16		Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9			-Aug-16		Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9			-Aug-16		Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9			-Aug-16		Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9			-Aug-16		Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below											Number of Containers																																																																																																																																																																											
22	WA-BC	03-Aug-16	15:15	Water	R	R	R	R	R	R	R	R	R	R	R		R	R	R	R	R	R	R	9																																																																																																																																																																			
		-Aug-16		Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9																																																																																																																																																																				
		-Aug-16		Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9																																																																																																																																																																				
		-Aug-16		Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9																																																																																																																																																																				
		-Aug-16		Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9																																																																																																																																																																				
		-Aug-16		Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9																																																																																																																																																																				
		-Aug-16		Water	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	9																																																																																																																																																																				
Drinking Water (DW) Samples (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> Yes <input type="checkbox"/> No Are samples for human drinking water use? <input type="checkbox"/> Yes <input type="checkbox"/> No		Special Instructions / Specify Criteria to add on report (client use)		SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input type="checkbox"/> SIF Observations <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Ice packs <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Custody seal intact <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling initiated <input checked="" type="checkbox"/> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>INITIAL COOLER TEMPERATURES °C</td> <td>FINAL COOLER TEMPERATURES °C</td> </tr> <tr> <td>8.0</td> <td>17.6/12.1 5/659.6</td> </tr> </table> INITIAL SHIPMENT RECEPTION (lab use only) Received by: [Signature] Date: 08/03/16 Time: 1:50pm											INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C	8.0	17.6/12.1 5/659.6																																																																																																																																																																									
INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C																																																																																																																																																																																										
8.0	17.6/12.1 5/659.6																																																																																																																																																																																										
SHIPMENT RELEASE (client use) Released by: _____ Date: _____ Time: _____		FINAL SHIPMENT RECEPTION (lab use only) Received by: [Signature] Date: 08/03/16 Time: 2:25																																																																																																																																																																																									

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY
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 1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



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

Date Received: 03-AUG-16
Report Date: 16-AUG-16 18:49 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1808095
Project P.O. #: NOT SUBMITTED
Job Reference: MOUNT NANSEN 16-Y-0089
C of C Numbers: 1
Legal Site Desc:

Can Dang
Senior Account Manager

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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					
Grouping	Analyte				

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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** 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
----------------------------	---------------------

Chain of Custody Numbers:

1

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.



ALS Environmental
ATTN: Can Dang
Suite 100-8081 Lougheed Hwy.
Burnaby, BC
V5A 1W9

Report Date: August 12, 2016
Work Order: 16824

Data Report

Species: Rainbow trout (*Oncorhynchus mykiss*)
Protocol: EPS 1/RM/13 (Second Ed. 2000 with 2007 & 2016 amendments)

Table 1. Results for the 96-h rainbow trout acute LC50 toxicity test.

Sample ID	Collection Date and Time	96-h LC50 (%v/v)
L1808095-1 WQ-SEEP	August 2, 2016 @ N/A	>100

N/A = Not Available.

The test met performance criterion and there were no deviations from the test method. The results relate only to the sample tested.

Yvonne Lam, B.Sc.
Laboratory Biologist

Reviewed By:
Julianna Kalocai, M.Sc., R.P.Bio
QA Officer

Rainbow Trout Summary Sheet

Client: ALS

Start Date/Time: Aug 05 /16 @ 1615h

Work Order No.: 16824

Test Species: Oncorhynchus mykiss

Sample Information:

Sample ID: 4808095-1-WQ-SEEP
Sample Date: Aug 02 /16
Date Received: Aug 05 /16
Sample Volume: 2 X 20 L
Other: /

Test Validity Criteria:

≥ 90% control survival

WQ Ranges:

T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Dilution Water:

Type: Dechlorinated Municipal Tap Water
Hardness (mg/L CaCO₃): 11
Alkalinity (mg/L CaCO₃): 11

Test Organism Information:

Batch No.: 071816a
Source: Aqua Farms
No. Fish/Volume (L): 10/10L
Loading Density (g/L): 0.38
Mean Length ± SD (mm): 30 ± 1
Mean Weight ± SD (g): 0.38 ± 0.06

Range: 29 - 31
Range: 0.31 - 0.48

Zinc Reference Toxicant Results:

Reference Toxicant ID: RTZn45
Stock Solution ID: 15Zn05
Date Initiated: Aug 1 /16
96-h LC50 (95% CL): 30.9 (23.3 - 40.9) µg/L Zn

Reference Toxicant Mean and Historical Range: 58.0 (29.4 - 114.4) µg/L Zn
Reference Toxicant CV (%): 40%

Test Results: The 96h LC50 is estimated to be >100% (v/v).

Reviewed by: JGK

Date reviewed: Aug-10/16

96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: ALS
 Sample I.D. L1808095-1-WQ-SEED
 W.O. # 16824
 RBT Batch #: 071816 a
 Date Collected/Time: Aug 02/16 @ not available
 Date Setup/Time: Aug 05/16 @ 16:15h
 Sample Setup By: EC

Number Fish/Volume: 10/10 L
 7-d % Mortality: 0.1
 Total Pre-aeration Time (mins): 30
 Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Y

Thermometer: CER# 2 D.O. meter: 2
 Cond./Salinity: 2 pH meter: 1

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	15.0	/	15.0
pH	6.7	/	6.8
D.O. (mg/L)	8.4	/	9.0
Cond. (µS/cm)	1443	/	1443
Salinity (ppt)	0.7	/	0.7

Concentration (% v/v)	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)		
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96	
Control				10	10	10	10	15.0	15.0	15.0	15.0	15.0	9.8	9.9	9.8	9.7	9.7	6.8	6.9	7.0	6.9	6.9	28	41	
6.25				10	10	10	10	15.0	15.0	15.0	15.0	15.0	9.9	9.6	9.8	9.7	9.7	6.8	7.1	7.2	7.3	7.2	177	189	
12.5				10	10	10	10	15.0	15.0	15.0	15.0	15.0	9.9	9.7	9.8	9.7	9.8	6.8	7.4	7.5	7.6	7.6	326	377	
25				10	10	10	10	15.0	15.0	15.0	15.0	15.0	9.9	9.7	9.9	9.8	9.9	6.9	7.6	7.6	7.8	7.8	509	515	
50				10	10	10	10	15.0	15.0	15.0	15.0	15.0	9.9	9.6	9.8	9.8	9.8	6.8	7.7	7.7	8.1	8.0	843	845	
100				10	10	10	10	15.0	15.0	15.0	15.0	15.0	9.0	9.7	9.8	9.8	9.8	6.8	7.9	7.8	8.3	8.2	1443	1437	
Initials				AS	AS	EL	EL	EC	AS	AS	EL	EL	EC	AS	AS	EL	EL	EC	AS	AS	EL	EL	EC	EC	EC

Sample Description/Comments: Orange, turbid, colorless, ~~to~~ Some particulates.

Fish Description at 96 h All fish appear healthy Number of Stressed Fish at 96 h 0

Other Observations: _____

Reviewed by: JGU

Date Reviewed: Aug. 10/16

Subcontract Request Form
Subcontract To:
NAUTILUS ENVIRONMENTAL

 8664 COMMERCE COURT
 BURNABY, BC V5A 4N7

NOTES: Please reference on final report and invoice: PO# L1808095
 ALS requires QC data to be provided with your final results.

WO # 16824

 Please see enclosed 1 sample(s) in 2 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED	Priority Flag
		DUE DATE	
L1808095-1 WQ-SEEP	Trout Bioassay LC50 (96 Hour) - Nautilus (TROUT-LC50-96HR-NL 1)	8/ 2/ 2016	
		8/15/2016	

Subcontract Info Contact: Walter Lin (604) 253-4188

 Analysis and reporting info contact: Can Dang
 8081 LOUGHEED HWY
 SUITE 100
 BURNABY, BC V5A 1W9

Phone: (604) 253-4188

Email: can.dang@alsglobal.com

 Please email confirmation of receipt to: can.dang@alsglobal.com

Shipped By: [Signature] Date Shipped: Aug 05, 2016
 Received By: HMC Date Received: Aug 5
 Verified By: _____ Date Verified: _____
 Temperature: ~~10~~ 10°C

Sample Integrity Issues: _____

*Received by Nautilus
 2x20L
 Temp - 6.5°C
 Aug 05/16 @ 15:45
 NY - Nari Yamamoto*



ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L1808095-COFC

COC Number: 14 -

Page of

Report To: EDI, Company: Lyndsay Doetzel, Address: 2195 - 2nd Avenue Whitehorse, YT Y1A 3T8, Phone: 867-393-4882, Report Format: PDF, EXCEL, EDD (DIGITAL), Quality Control (QC) Report with Report Yes, Select Distribution: EMAIL, MAIL, FAX, Email 1 or Fax: ldoetzel@edynamics.com, Email 2: erik.pit@gov.yk.ca, Email 3: Emilie.Hamm@gov.yk.ca, Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests): Regular, Priority, Emergency, Same day or weekend emergency

Invoice To: Same as Report To Yes, Copy of Invoice with Report Yes, Invoice Distribution: EMAIL, MAIL, FAX, Email 1 or Fax: sjenner@edynamics.com, Email 2: ldoetzel@edynamics.com, Project Information: ALS Quote #: Q55559, Job #: MOUNT NANSEN 16Y0089, PO / AFE: LSD: Oil and Gas Required Fields (client use): Approver ID, Cost Center, GL Account, Routing Code, Activity Code, Location

Table with columns: ALS Lab Work Order #, ALS Sample #, Sample Identification and/or Coordinates, Date, Time, Sample Type, Analysis Request, Number of Containers. Row 1: WQ-SEEP, 02-Aug-16, 17:10, Water, R, 2

Drinking Water (DW) Samples (client use), Special Instructions / Specify Criteria to add on report (client Use), SAMPLE CONDITION AS RECEIVED (lab use only), Frozen, Ice packs, Cooling Initiated, SIF Observations, Custody seal intact, INITIAL COOLER TEMPERATURES °C, FINAL COOLER TEMPERATURES °C

SHIPMENT RELEASE (client use), INITIAL SHIPMENT RECEPTION (lab use only), FINAL SHIPMENT RECEPTION (lab use only), Released by, Date, Time, Received by, Date, Time



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

Date: 16-AUG-16
PO No.:
WO No.: L1808090
Project Ref: MOUNT NANSEN 16-Y-0089
Sample ID: WQ-PW
Sampled By:
Date Collected: 03-AUG-16
Lab Sample ID: L1808090-1
Matrix: Water


Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
Physical Tests						
Colour, True	<5.0		CU			06-AUG-16
Conductivity	354		uS/cm			10-AUG-16
Hardness (as CaCO3)	182		mg/L		500	15-AUG-16
pH	7.93		pH		6.5-8.5	10-AUG-16
Total Dissolved Solids	197		mg/L		500	15-AUG-16
Turbidity	0.12		NTU			05-AUG-16
Anions and Nutrients						
Alkalinity, Total (as CaCO3)	162		mg/L			10-AUG-16
Chloride (Cl)	<0.50		mg/L		250	04-AUG-16
Fluoride (F)	0.112		mg/L	1.5		04-AUG-16
Nitrate (as N)	0.124		mg/L	10		04-AUG-16
Nitrite (as N)	<0.0010		mg/L	1		04-AUG-16
Sulfate (SO4)	32.7		mg/L		500	04-AUG-16
Anion Sum	3.93		meq/L			15-AUG-16
Cation Sum	3.87		meq/L			15-AUG-16
Cation - Anion Balance	-0.8		%			15-AUG-16
Total Metals						
Aluminum (Al)-Total	<0.010		mg/L		0.1	12-AUG-16
Antimony (Sb)-Total	<0.00050		mg/L	0.006		12-AUG-16
Arsenic (As)-Total	0.00041		mg/L	0.01		12-AUG-16
Barium (Ba)-Total	0.084		mg/L	1		12-AUG-16
Boron (B)-Total	<0.10		mg/L	5		12-AUG-16
Cadmium (Cd)-Total	<0.00020		mg/L	0.005		12-AUG-16
Calcium (Ca)-Total	41.9		mg/L			12-AUG-16
Chromium (Cr)-Total	<0.0020		mg/L	0.05		12-AUG-16
Copper (Cu)-Total	<0.0010		mg/L		1.0	12-AUG-16
Iron (Fe)-Total	<0.030		mg/L		0.3	12-AUG-16
Lead (Pb)-Total	0.00059		mg/L	0.01		12-AUG-16
Magnesium (Mg)-Total	18.9		mg/L			12-AUG-16
Manganese (Mn)-Total	<0.0020		mg/L		0.05	12-AUG-16
Mercury (Hg)-Total	<0.00020		mg/L	0.001		05-AUG-16
Potassium (K)-Total	0.93		mg/L			12-AUG-16
Selenium (Se)-Total	<0.0010		mg/L	0.05		12-AUG-16
Sodium (Na)-Total	4.6		mg/L		200	12-AUG-16
Uranium (U)-Total	0.00180		mg/L	0.02		12-AUG-16
Zinc (Zn)-Total	<0.050		mg/L		5.0	12-AUG-16

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



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

Date: 16-AUG-16
PO No.:
WO No.: L1808090
Project Ref: MOUNT NANSEN 16-Y-0089
Sample ID: WQ-PW
Sampled By:
Date Collected: 03-AUG-16
Lab Sample ID: L1808090-1
Matrix: Water

Test Description	Result	Qualifier	Units of Measure	CDWQG MAC	Aesthetic Objective	Date Analyzed
CDWQG = Health Canada Guideline Limits updated	DECEMBER 2015					
<p>* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit. * Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality - A blank entry designates no known limit. - A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.</p>						
<p>Approved by  _____ Can Dang Account Manager</p>						

Guidelines & Objectives

Health Canada MAC Health Related Criteria Limits

Nitrate/Nitrite-N*	Criteria limit is 10 mg/L (1.0 mg/L if present as all Nitrite-N). High concentrations may contribute to blue baby syndrome in infants.
Lead*	A cumulative body poison, uncommon in naturally occurring hard waters.
Fluoride*	Present in fluoridated water supplies at 0.8 mg/L to reduce dental caries. Elevated levels causes fluorosis (mottling of teeth).
Total Coliforms*	Criteria is 0 CFU/100mL. Adverse health effects.
E. Coli*	Criteria is 0 CFU/100 mL. Certain E. Coli bacteria can be life threatening.

*Health Canada Canadian Drinking Water Quality Guidelines (MAC limit)

Aesthetic Objective Concentration Levels

Alkalinity	Acid neutralizing capacity. Usually a measure of carbonate and bicarbonates and calculated and reported as calcium carbonate.
Balance	Quality control parameter ratioing cations to anions
Bicarbonate	See Alkalinity. Report as the anion HCO ₃ -1
Carbonate	See Alkalinity. Reported at the anion CO ₃ -2
Calcium	See Hardness. Common major cation of water chemistry.
Chloride	Common major anion of water chemistry.
Conductance	Physical test measuring water salinity (dissolved ions or solids)
Hardness	Classical measure or capacity of water to precipitate soap (chiefly calcium and magnesium ions). Causes scaling tendency in water if carbonates/bicarbonates are present (if >200 mg/L). For drinking water purposes waters with results <200 mg/L are considered acceptable, results >200 mg/L are considered poor but can be tolerated. Results >500 mg/L are unacceptable.
Hydroxide	See alkalinity
Magnesium	See hardness. Common major cation of water chemistry. Elevated levels (>125 mg/L) may exert a cathartic or diuretic action.
pH	Measure of water acidity/alkalinity. Normal range is 7.0-8.5.
Potassium	Common major cation of water chemistry.
Sodium	Common major cation of water chemistry. Measure of salinity (saltiness).
Sulphate	Common major anion of water chemistry. Elevated levels may exert a cathartic or diuretic action.
Total Dissolved Solids	A measure of water salinity.
Iron	Causes staining to laundry and porcelain and astringent taste. Oxidizes to red-brown precipitate on exposure to air.
Manganese	Elevated levels may cause staining of laundry and porcelain.
Heterotrophic Plate Count	Criteria is 500 cfu/mL Measure of heterotrophic bacteria present.

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

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

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

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.



BACTERIOLOGICAL ANALYSIS OF DRINKING WATER
ANALYSE BACTÉRIOLOGIQUE DE L'EAU POTABLE

Health and Social Services
 Santé et Affaires sociales
 Environmental Health Services
 Service d'hygiène du milieu

#2 Hospital Road, Whitehorse, Yukon Y1A 3H8
 phone : (867) 667-8391 fax : (867) 667-8322
 Toll free: 1-800-661-0408 ext.8391

2 Hospital Road, Whitehorse (Yukon) Y1A 3H8
 Tél. : 867-667-8391 Téléc. : 867-667-8322
 Sans frais au Yukon : 1-800-661-0408, poste 8391

Contact Information - Coordonnées de la personne ressource

Contact Person Lindsay Doetzel Phone 867-393-4882
 Personne ressource Lindsay Doetzel Téléphone 867-393-4882
 Mailing address #5 2195 Second Ave Fax 867-393-4883
 Adresse postale Whitehorse YT Télécopieur 867-393-4883
 Postal code Y1A 3T8
 First Nation, Municipal or Business Name Environmental Dynamics inc
 Nom de la Première nation, de la municipalité ou de l'entreprise Environmental Dynamics inc
 Agent Joel Macfabe Fax
 Agent Joel Macfabe Télécopieur

Sampling Location - Lieu de la prise d'échantillon

Municipal Address NANSEN MINE Subdivision
 Adresse municipale NANSEN MINE Lotissement
 Legal Description Lot Pumphouse well Quad
 Désignation officielle Lot Pumphouse well Quadri latère
 Plan no.
 Other Information (e.g., Location, Business / Building Name) PWA-PW
 Autres renseignements (ex. : emplacement, nom de l'entreprise, nom de l'édifice)

Sample Collection / Prélèvement de l'échantillon

Sample Collected By JM Date 16 08 03 Time 15:00 am
 Échantillon prélevé par JM Date 16 08 03 Heure 15:00 am
 YY/MM/DD - AA/MM/JJ
 Sampling Site (e.g., kitchen tap) Pump house well
 Point d'échantillonnage (ex. : robinet de cuisine) Pump house well
 Is this a Resample from a Previous Test? Yes No Previous Sample Number
 Est-ce un deuxième échantillon d'un test antérieur? Oui Non Numéro de l'échantillon précédent

Sample Supply / Source d'approvisionnement en eau

Public Supply Bulk Water Distributor Business Private Residence
 Municipal - par canalisation Municipal - par camion Privé - entreprise Privé - résidence

Sample Source / Provenance de l'échantillon

Dug Well Driven Well Drilled Well Depth of Well
 Puits creusé Puits tubulaire Puits foré à la sondeuse Profondeur du puits
 Water Holding Tank Other (explain)
 Réservoir d'eau Autre (précisez)

Water Treatment / Traitement de l'eau

Is the Water Chlorinated? Yes No Free Available Chlorine ppm
 L'eau contient-elle du chlore? Oui Non Chlore libre disponible mg/L
 Other Treatment Systems (e.g., UV, softener, filter)
 Autre dispositif de traitement (ex. : désinfection aux rayons UV, adoucisseur d'eau, filtre)

For Laboratory Use Only / À l'usage du laboratoire seulement

Receipt of Sample Date 16/08/04 Time 8:50 am By EH
 Réception de l'échantillon Date 16/08/04 Heure 8:50 pm Par EH
 YY/MM/DD - AA/MM/JJ
 Condition of Sample Satisfactory Unsatisfactory Details 6.6°C
 État de l'échantillon Satisfaisant Non satisfaisant Précisez 6.6°C
 Incubation Date 16/08/04 Time 1:10 am By N Incubator 1
 Incubation Date 16/08/04 Heure 1:10 pm Par N Incubateur 1
 Analysis Completed Date 16/08/05 Time 1:40 am By N
 Analyse terminée Date 16/08/05 Heure 1:40 pm Par N

Results (See Reverse Side for Interpretation) per 100 ml
Résultats (Voir au verso l'interprétation des résultats)

Total Coliforms/Coliformes totaux

Present / Présence Absent / Absence

E. coli/E. coli

Present / Présence Absent / Absence

Comments / Commentaires

Report Authorized By M-M Position EH Date 16/08/05
 Rapport autorisé par M-M Poste EH Date 16/08/05
 YY/MM/DD - AA/MM/JJ
 Distribution: White - Chain of Custody Yellow - Lab Copy Pink - Client Copy
 Distribution: Blanc - Chaîne de possession Jaune - Laboratoire Rose - Client

Sample Number : **67357**
 Numéro de l'échantillon : **67357**



**BACTERIOLOGICAL ANALYSIS OF DRINKING WATER
ANALYSE BACTÉRIOLOGIQUE DE L'EAU POTABLE**

Health and Social Services
Santé et Affaires sociales
Environmental Health Services
Service d'hygiène du milieu

#2 Hospital Road, Whitehorse, Yukon Y1A 3H8
phone : (867) 667-8391 fax : (867) 667-8322
Toll free: 1-800-661-0408 ext.8391

2 Hospital Road, Whitehorse (Yukon) Y1A 3H8
Tél. : 867-667-8391 Téléc. : 867-667-8322
Sans frais au Yukon : 1-800-661-0408, poste 8391

Contact Information • Coordonnées de la personne ressource

Contact Person / Personne ressource: Lyndsay Doakel Phone / Téléphone: 867-393-4883
Mailing address / Adresse postale: 2195 Springs Ave Fax / Télécopieur: 867-393-4883
Whitehorse YT Postal code / Code postal: Y1A 3B8
First Nation, Municipal or Business Name / Nom de la Première nation, de la municipalité ou de l'entreprise: Environment Dynamics Inc
Agent: John Healy Fax / Télécopieur: _____

Sampling Location • Lieu de la prise d'échantillon

Municipal Address / Adresse municipale: HANSEN AVE Subdivision / Lotissement: _____
Legal Description Lot / Désignation officielle Lot: Pump house well Quad / Quadrilatère: _____ Plan no. / Plan n°: _____
Other Information (e.g., Location, Business / Building Name) / Autres renseignements (ex.: emplacement, nom de l'entreprise, nom de l'édifice): Pump house well

Sample Collection / Prélèvement de l'échantillon

Sample Collected By / Échantillon prélevé par: JM Date / Date: 16 08 03 Time / Heure: 15:00 am / pm
Sampling Site (e.g., kitchen tap) / Point d'échantillonnage (ex.: robinet de cuisine): Pump house well
Is this a Resample from a Previous Test? / Est-ce un deuxième échantillon d'un test antérieur? Yes / Oui No / Non Previous Sample Number / Numéro de l'échantillon précédent: _____

Sample Supply / Source d'approvisionnement en eau

Public Supply / Municipal - par canalisation Bulk Water Distributor / Municipal - par camion Business / Privé - entreprise Private Residence / Privé - résidence

Sample Source / Provenance de l'échantillon

Dug Well / Puits creusé Driven Well / Puits tubulaire Drilled Well / Puits foré à la sondeuse Depth of Well / Profondeur du puits: _____
 Water Holding Tank / Réservoir d'eau Other (explain) / Autre (précisez): _____

Water Treatment / Traitement de l'eau

Is the Water Chlorinated? / L'eau contient-elle du chlore? Yes / Oui No / Non Free Available Chlorine / Chlore libre disponible: _____ ppm / mg/L
Other Treatment Systems (e.g., UV, softener, filter) / Autre dispositif de traitement (ex.: désinfection aux rayons UV, adoucisseur d'eau, filtre): _____

For Laboratory Use Only / À l'usage du laboratoire seulement

Receipt of Sample / Réception de l'échantillon: Date / Date: 16/08/04 Time / Heure: 8:35 am / pm By / Par: CH
Condition of Sample / État de l'échantillon: Satisfactory / Satisfaisant Unsatisfactory / Non satisfaisant Details / Précisez: 6.6°C
Incubation / Incubation: Date / Date: _____ Time / Heure: _____ am / pm By / Par: _____ Incubator / Incubateur: _____
Analysis Completed / Analyse terminée: Date / Date: _____ Time / Heure: _____ am / pm By / Par: _____

**Results (See Reverse Side for Interpretation) per 100 ml
Résultats (Voir au verso l'interprétation des résultats)**

Total Coliforms/Coliformes totaux <input type="checkbox"/> Present / Présence <input checked="" type="checkbox"/> Absent / Absence	E. coli/E. coli <input type="checkbox"/> Present / Présence <input checked="" type="checkbox"/> Absent / Absence
--	--

Comments / Commentaires

Report Authorized By / Rapport autorisé par: _____ Position / Poste: _____ Date / Date: _____
Distribution: White - Chain of Custody / Blanc - Chaîne de possession Yellow - Lab Copy / Jaune - Laboratoire Pink - Client Copy / Rose - Client

Sample Number : **67357**
Numéro de l'échantillon : **67357**