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October 25, 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: September 2016 - FINAL

Trip dates:	September 6-8, 2016
EDI field staff:	Dawn Hansen, Alexandre Mischler and Danny Skookum
Weather during trip:	Air temperatures ranged from 5 to 8°C, with mainly cloudy skies and light to moderate rain

This monthly report includes a summary of site conditions and data collected during EDI's September 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	⌋ Summary of weather and general site conditions
Meteorology	⌋ Statement on meteorological station status and identification of any data gaps or QA/QC issues
Hydrology	⌋ Discussion of hydrology data for this month ⌋ Statement of QA/QC for the data collected this month
Water Quality	⌋ Summary of water quality results for this month ⌋ Statement on QA/QC sample results for this month
Program Recommendations	⌋ Program recommendations for meteorological, hydrology and water quality programs
Additional Trip Information	⌋ Project safety concerns ⌋ Wildlife sightings ⌋ Budget and schedule considerations

Report Section	Description
List of Attachments	1. Maps of Hydrometric Stations and Water Quality Sites 2. Site and Station Photos (September 2016) 3. Hydrology Summary Data Tables (September 2016) 4. Water Quality Summary Data Tables (September 2016) 5. Laboratory Certificates of Analysis (COA) & Yukon Environmental Health Services Bacteriological Results (September 2016).

SITE CONDITIONS

The September 2016 trip was reflective of late-summer conditions. Water levels were moderate at most sites and stations, similar to levels observed during the August 2016 trip. The weather on September 6 consisted of temperature up to 8°C with rain showers beginning late in the evening. September 7 and 8 were overcast with calm to moderate winds and a high of 8°C. All watercourses scheduled for sampling were flowing, except for seepage site WQ-NW-SEEP-02 where the flowrate was insufficient to fill all sample bottles. Placer mining construction works continue to operate along Pony Creek upstream of H-PC-DSP/ WQ-PC-U, with heavy equipment operating at the time of sampling.

METEOROLOGY

Meteorological data was collected at the ATM-ROAD station throughout September 2016. EDI conducted a QA/QC review of the September 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 September 2016 trip. A total of 12 discharge measurements were collected at the Mount Nansen site. Flow rates were higher at all sites in September than during the August 2016 visit. Continuous water level 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 September 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. September discharge values

along Victoria Creek ranged from 0.583 to 0.719 m^3/s. The September discharges represent higher flow conditions than during the August 1–3 trip.

- Flows increased in the downstream direction along Victoria Creek as the contributing watershed area increased, with the exception of a 0.026 m^3/s flow loss between H-VC-UMN and the downstream station H-VC-R+290. 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 three stations: H-DC-B, H-DC-M WP and H-DC-R. Volumetric methods were used at H-DC-DX+105 and H-DC-D1b. September discharge values ranged from 0.003 to 0.023 m^3/s.
- The discharge at the Pony Creek station, H-PC-DSP, was measured using volumetric techniques and calculated to be 0.007 m^3/s.
- A discharge measurement was collected at the Back Creek station, H-BC, using salt dilution gauging methods with a discharge value of 0.075 m^3/s, which represents a higher discharge than the August measurement.
- The H-SEEP volumetric discharge measurement on September 7, 2016 (0.003 m^3/s) was identical to the flow rate observed at the pump in the seepage pond shack (0.003 m^3/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. Accumulated sediment from within the weir pond was excavated for approximately 45 minutes.
- Placer mining operations along Pony Creek were underway during the September 2016 visit. Large earthworks using heavy equipment were observed and two sluice boxes were running at the time of sampling. Placer activity continues to produce non-representative hydrological conditions along Pony Creek.
- Placer mining operations along Back Creek, upstream of H/WQ-BC, are contributing to highly turbid water in the creek.

WATER QUALITY

Water quality samples and in-situ data were collected at all planned sites with flowing water during the September 2016 trip. A total of 18 sites were sampled (Attachment 4). The drinking water sample, including a bacteriological sample, was collected from the pumphouse well (WQ-PW) on September 8, 2016. 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 late summer conditions at Mount Nansen when water levels were moderate.

Water Quality Results Summary

- The WQ-SEEP samples exceeded CCME-AL guidelines for ammonia, total and dissolved arsenic, iron and zinc. Total iron and manganese exceeded Mount Nansen EQS.
- Tailings Pond (WQ-TP) samples exceeded CCME-AL guidelines for fluoride, total and dissolved arsenic, cadmium, copper, as well as for total lead and zinc.
- On Dome Creek, CCME-AL guidelines were exceeded for the following parameters and sites: fluoride (WQ-DC-DX+105), total aluminum (WQ-DC-D1B, WQ-DC-B, WQ-DC-U), total and dissolved arsenic (all sites from WQ-DC-DX to WQ-DC-R), total cadmium (WQ-DC-DX+105, WQ-DC-D1B), dissolved cadmium (WQ-DC-DX+105), total copper (WQ-DC-D1B, WQ-DC-B, WQ-DC-U), total iron (all sites from WQ-DC-DX to WQ-DC-R), dissolved iron (WQ-DC-DX, WQ-DC-B, WQ-DC-U, WQ-DC-R), total lead (WQ-DC-D1B), total zinc (WQ-DC-DX+105, WQ-DC-D1B, WQ-DC-B, WQ-DC-U), dissolved zinc (WQ-DC-DX+105, 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 and WQ-DC-U. Total zinc exceeded Mount Nansen EQS for WQ-DC-DX+105 and WQ-DC-D1B. Total suspended solids also exceeded Mount Nansen EQS for WQ-DC-D1B, WQ-DC-B and WQ-DC-U.
- On Victoria Creek CCME-AL guidelines were exceeded for the following parameters and sites: total aluminum (WQ-VC-DBC, WQ-VC-UMN and WQ-VC-R), total copper (WQ-VC-DBC) and total iron (WQ-VC-DBC, WQ-VC-R).
- Back Creek (WQ-BC) samples exceeded CCME-AL guidelines for total aluminum, arsenic, cadmium, chromium, copper, iron, lead, mercury, silver and zinc. Total iron, manganese, and suspended solids also exceeded Mount Nansen EQS. Placer mining activity upstream of the sampling site is producing highly turbid water within Back Creek.
- The upstream (WQ-PC-U) and downstream (WQ-PC-D) Pony Creek sites had samples that exceeded CCME-AL guidelines for total ammonia, aluminum, arsenic, cadmium, chromium, copper, iron, lead, mercury, silver and zinc. Dissolved arsenic also exceeded CCME-AL guidelines at both sites. Total suspended solids, total iron and 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 WQ-CH-P-13-01 exceeded CCME-AL guidelines for total and dissolved aluminum, cadmium and zinc. Total zinc also exceeded Mount Nansen EQS.
- A partial sample only was collected at WQ-NW-SEEP-02 because of a very low flow rate from the seepage pipe. The total metals container was filled and preserved on site and half of the general parameters bottle was filled. The laboratory was able to use water from the general

parameters sample to complete all analyses, including dissolved metals, except for the mercury parameters. Therefore, for this site only, the dissolved metals parameters were not field filtered and preserved. The sample exceeded CCME-AL guidelines for fluoride, total aluminum, arsenic, cadmium, copper, iron and zinc, as well as for dissolved arsenic and copper.

- The bacteriological sample collected at WQ-PW on September 8, 2016 was absent of total coliforms and E. coli. All other sampling results for WQ-PW did not exceed CCME-AL guidelines.

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-U-r was 6% with an average difference of 9% for total and 5% for dissolved metals. Total titanium and total silver had RPD>20%.

The average RPD of the replicate sample WQ-VC-UMN-r was 11% with an average difference of 17% for total and 3% for dissolved metals. Alkalinity (bicarbonate), nitrate, sulfate, total aluminum, total arsenic and total manganese had RPD>20%. While these RPD values are higher than normally found, they are still within acceptable ranges. Some of the variation is likely associated with a laboratory sample logging error that resulted in the September samples being analysed as three separate batches, rather than combined; specifically, the WQ-VC-UMN sample and replicate were analyzed as parts of two different batches and on separate days.

PROGRAM RECOMMENDATIONS

- Conduct concurrent 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 October 3 – 5, 2016. The next trip will be the eighth of the 2016/2017 Water Resources Investigation, and the last of the Open Water Season.
Any alterations to sample schedule/budget:	None
Additional Comments:	None
Wildlife Sightings:	Snowshoe hares and spruce grouse were observed at multiple locations around the Mount Nansen site.
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.

0 2.5 5 10 15
kilometers

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

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

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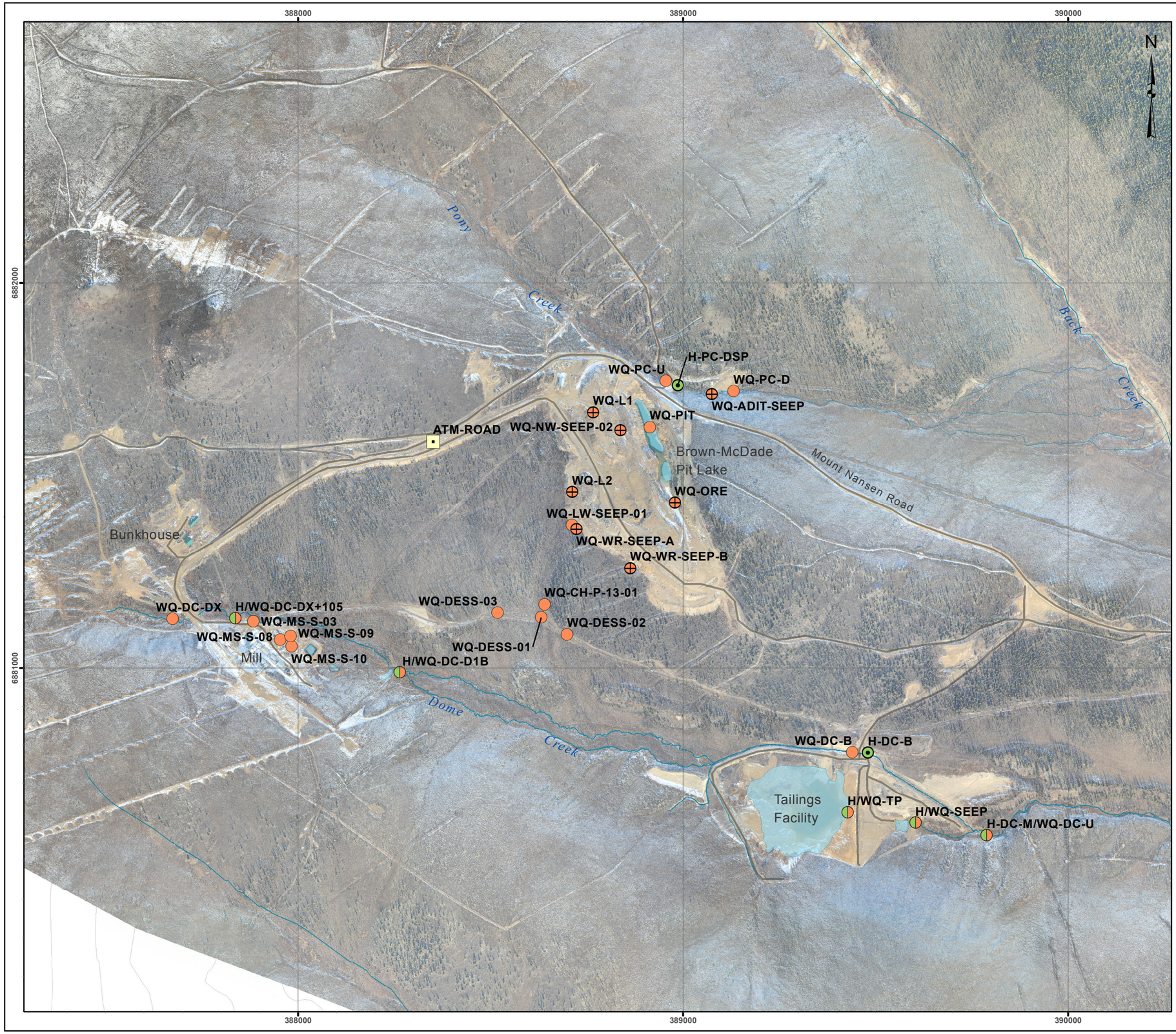

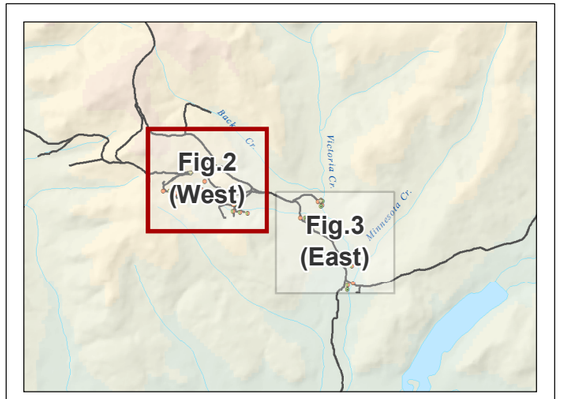

Legend

- 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 (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.

0 50 100 200 300 400 500
metres

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

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

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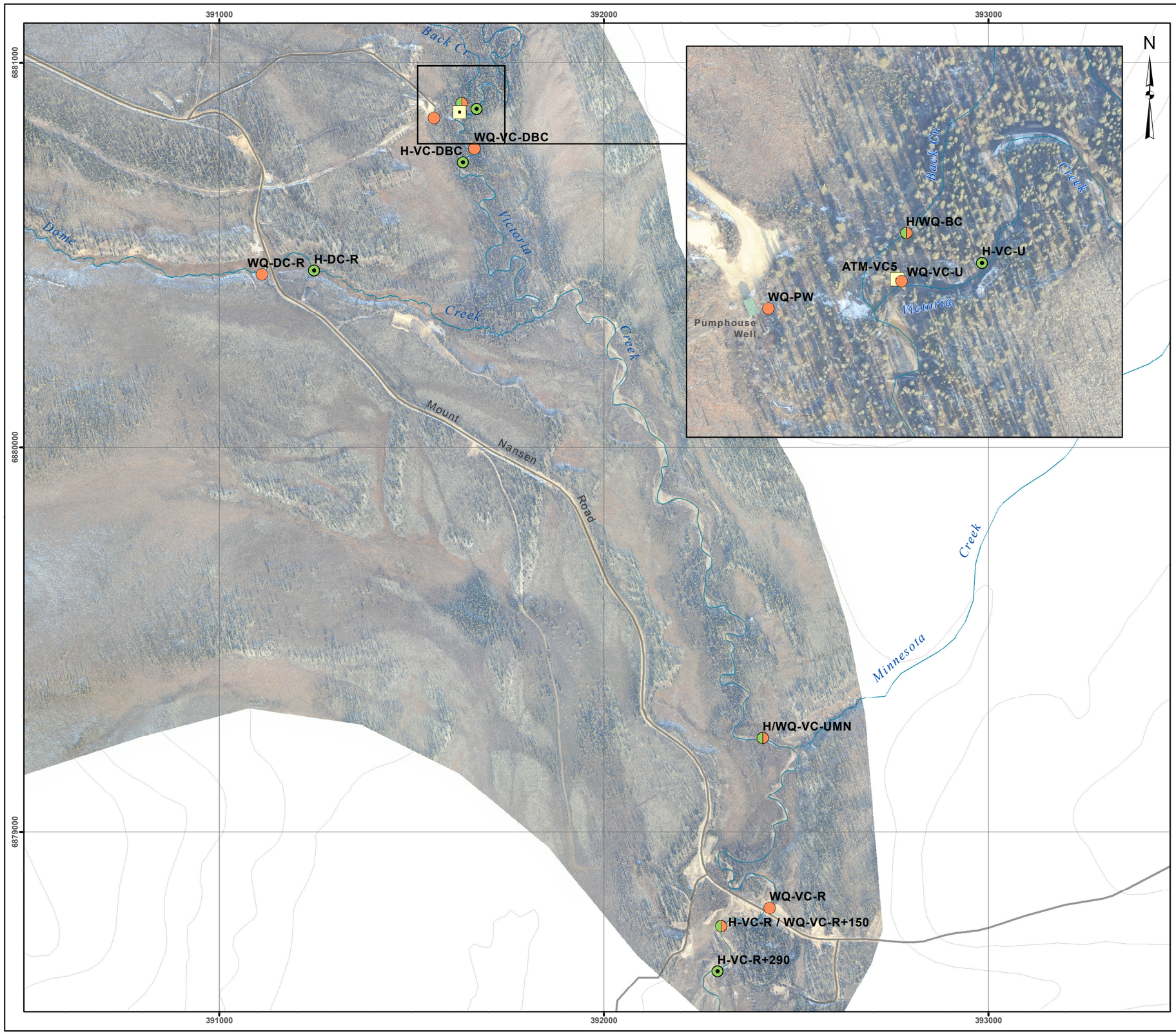

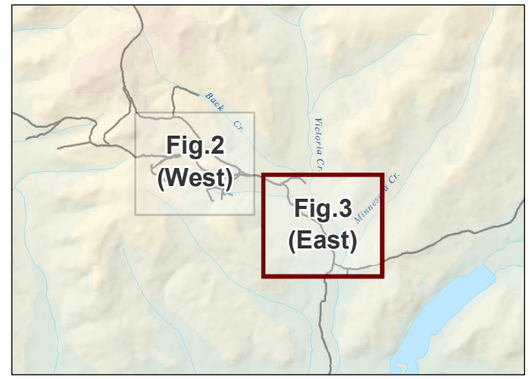

Legend

- 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.

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.

0 50 100 200 300 400 500
metres

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

Drawn:	Checked:	Date:	
MP	MM/SD	14/07/2016	**FIGURE 3**

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ATTACHMENT 2: SITE AND STATION PHOTOS

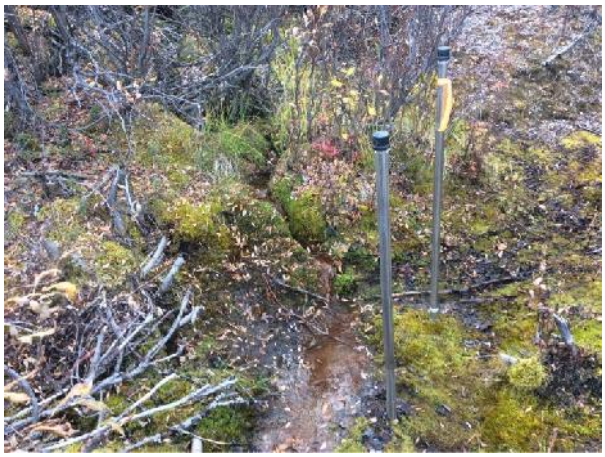

Photo 1. WQ-DC-DX – looking upstream.

Photo 2. H-DC-DX+105 – looking upstream at discharge measurement site.

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.

Photo 6. WQ-DC-B – overview, looking upstream

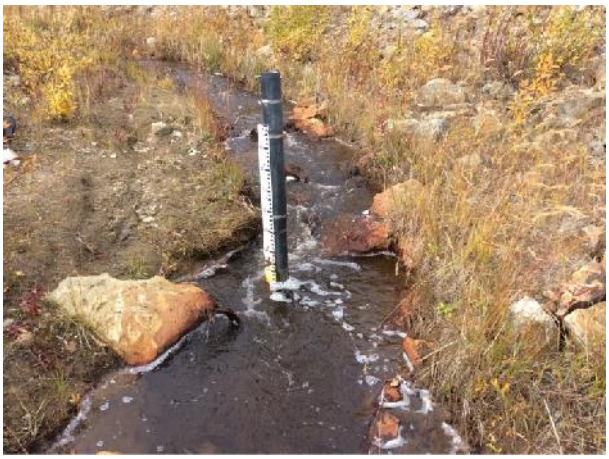

Photo 7. H-DC-B – looking downstream.

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 from weir pond.

Photo 13. H-DC-M WP – overview of weir.

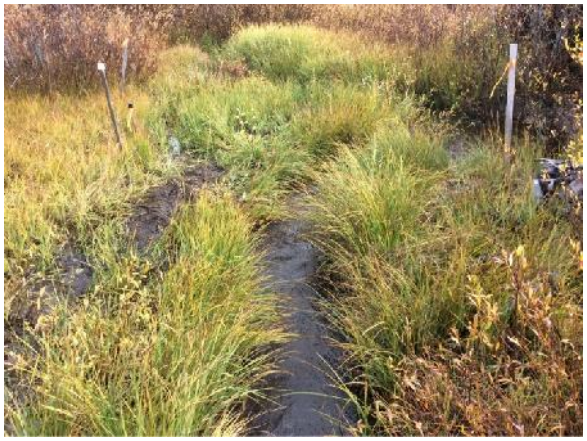

Photo 14. WQ-DC-U – looking downstream.

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

Photo 17. H-DC-R – looking upstream.

Photo 18. WQ-PC-U – looking downstream.

Photo 19. WQ-PC-D – looking upstream.

Photo 20. H-PC-DSP – looking upstream.

Photo 21. H/WQ-BC – looking upstream.

Photo 22. H-VC-U – looking downstream.

Photo 23. WQ-VC-U – looking upstream.

Photo 24. WQ-VC-U – looking downstream at confluence of Victoria Creek and Back Creek.

Photo 25. WQ-VC-DBC – looking downstream.

Photo 26. H-VC-DBC – looking upstream.

Photo 27. H/WQ-VC-UMN – looking downstream.

Photo 28. WQ-VC-R – looking upstream.

Photo 29. H-VC-R+290 – looking upstream.

Photo 30. WQ-NW-SEEP-02 – overview of sample site. Partial sample collected due to low flow rate.

Photo 31. WQ-PW – overview of site.

ATTACHMENT 3: 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
1482	ATM-VC5	07/09/2016	09:45	N	-	-	-	-	Barologger downloaded sucessfully and functioning properly.
1483	H-PC-DSP	07/09/2016	12:43	V	0.007	-	-	-	Volumetric discharge measurement completed at culvert outlet. Placer mining activity upstream of site.
1484	H-DC-DX+105	07/09/2016	18:12	V	0.003	-	-	-	High flow rate in channel. Volumetric discharge measurement completed.
1485	H-DC-D1b	07/09/2016	17:25	V	0.007	-	-	-	Volumetric discharge measurement completed. Water goes to ground approximately 1 m downstream of small waterfall.
1486	H-DC-B	07/09/2016	15:25	SS	0.017	-	1.956	-	Salt tracer completed for discharge measurement. Logger downloaded and functioning properly. Fine sediment accumulation within stilling well.
1487	H-DC-M WP	07/09/2016	13:08	SS	0.022	E	-	-	Salt tracer completed for discharge measurement. Fine sediment shoveled out from weir pond. Some ponded water along left downstream side of primary channel downstream of weir pond.
1488	H-DC-R	06/09/2016	17:23	SS	0.024	-	0.573	-	High water level in channel. Salt tracer completed for discharge measurement. Logger downloading and functioning properly.
1489	H-VC-U	07/09/2016	10:00	ADV-MID	0.583	-	2.132	-	Logger downloaded and functioning properly.
1490	H-VC-DBC	07/09/2016	09:00	ADV-MID	0.650	-	1.890	-	Logger downloaded and functioning properly. Water is lightly turbid downstream of confluence with Back Creek.
1491	H-BC	07/09/2016	11:15	SS	0.075	-	1.796	-	Logger downloaded and functioning properly.
1492	H-VC-UMN	06/09/2016	15:40	ADV-MID	0.624	-	1.690	-	Logger downloaded and functioning properly.
1493	H-VC-R+290	06/09/2016	14:05	ADV-MID	0.719	-	2.488	-	Logger downloaded and functioning properly.
1494	H-SEEP	07/09/2016	14:37	V	0.003	-	-	-	Volumetric discharge measurement collected at pipe outlet. Flow rate at pump meter at 14:45 170.325 L/min (0.003 m3/s).
1495	H-TP	07/09/2016	16:04			-	-	-	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 contained 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: WATER QUALITY DATA TABLES

Water Quality Site	Sample Collected? (Y/N)	Measurement Date	Comments
WQ-SEEP	Yes	07/09/2016	Moderate flow rate from pipe. Water level appears lower than usual.
WQ-TP	Yes	07/09/2016	Low water level similar to previous trips. Very windy while collecting sample.
WQ-DC-DX	Yes	07/09/2016	Moderate flow rate with clear water.
WQ-DC-DX+105	Yes	07/09/2016	Moderate to high flow rate with clear water.
WQ-DC-D1b	Yes	07/09/2016	Moderate flow rate with turbid water. No surface flow downstream of sampling site; water flows to ground downstream of small waterfall.
WQ-DC-B	Yes	07/09/2016	Moderate water level with turbid water.
WQ-DC-U	Yes	07/09/2016	Moderate to high flow with turbid water. Channel not confined downstream of the weir with small braided channels in the wetland area along left downstream bank.
WQ-DC-R	Yes	06/09/2016	Water level appears low with slow flow.
WQ-VC-U	Yes	07/09/2016	High flow with clear water. Sediment accumulation along right downstream bank.
WQ-VC-R	Yes	06/09/2016	Water level higher than normal for this time of year but is not freshet high. Sample collected at regular summer location upstream of culvert.
WQ-VC-DBC	Yes	07/09/2016	Moderate flow with lightly turbid water. Back Creek contributing suspended sediment into Victoria Creek at confluence.
WQ-VC-UMN	Yes	06/09/2016	Water level is high but lower than peak freshet flows. Turbidity is light.
WQ-BC	Yes	07/09/2016	Moderate to high flow with very turbid water.
WQ-PC-U	Yes	07/09/2016	Flow is moderate and water is very turbid. Upstream placer mining operations active with excavation works and two sluice boxes running at time of sampling.
WQ-PC-D	Yes	07/09/2016	Flow is moderate and water is very turbid. Upstream placer mining operations are active with excavation works and two sluice boxes running at time of sampling.
WQ-CH-P-13-01	Yes	07/09/2016	High flow in seep (approximately 0.25 L/s) with clear water. Algae growth in seep.
WQ-NW-SEEP-02	Yes	08/09/2016	A bag was left on pipe from 18:10 on Sept. 6 to 08:40 Sept. 8. Total metals vial and half of the general parameters bottle were filled with limited collected water.
WQ-PW	Yes	07/09/2016	Pump flow is moderate to high and water is clear. Drinking water and bacteriological samples collected.

Summary of Water Quality Results for the September 6 - 8, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1826266-1 WQ-SEEP 09/07/2016 14:30	L1826266-2 WQ-TP 09/07/2016 15:50	L1826266-3 WQ-DC-DX 09/07/2016 18:30	L1826266-4 WQ-DC-DX+105 09/07/2016 17:55	L1826266-5 WQ-DC-D1B 09/07/2016 17:25	L1826266-6 WQ-DC-B 09/07/2016 14:55	L1826266-7 WQ-DC-U 09/07/2016 13:30	L1826315-6 WQ-DC-U-r 09/07/2016 13:30	QA/QC WQ-DC-U Replicate Analysis	L1826331-1 WQ-DC-R 09/06/2016 17:00	L1826331-7 WQ-PC-U 09/07/2016 12:25
Temperature (in-situ)	°C	-	-	-	5.5	9.1	3	0.3	4.4	6.9	6.4	6.3	-	5.5	4.8
Specific Conductivity (in-situ)	µS/cm	-	-	-	1506	1258	527.6	1122	1464	1020	1040	1038	-	925	508.4
pH (in-situ)	pH	6.5 - 9.0	6.0 - 8.5	-	7.21	8.34	7.49	7.12	8.02	7.82	8.08	8.1	-	7.48	7.63
Dissolved Oxygen (in-situ)	mg/L	-	-	-	4.32	8.98	8.31	1.72	9.49	8.97	8.8	8.78	-	7.61	9.25
Turbidity (In-situ)	NTU	-	-	-	15.76	13.47	0.73	1.32	55.4	64.7	64.3	64.3	-	10.63	641
Colour, True	CU	15	-	5									-		
Conductivity	µS/cm	-	-	2	1430	1220	513	1110	1430	1000	1030	1030	0%	898	494
Hardness (as CaCO3)	mg/L	-	-	0.5	802	699	270	684	929	603	617	618	0%	507	232
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.47	8.02	7.69	7.53	8.1	7.93	8.06	8.1	0%	7.93	7.38
Total Suspended Solids	mg/L	-	50	3	20.8	9.9	11.8	6.6	***266***	***186***	***121***	***119***	2%	3.1	***352***
Total Dissolved Solids	mg/L	-	-	1	1120	992	340	823	1140	750	768	760	1%	639	326
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	266	91	104	273	280	159	171	173	1%	157	51.9
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<DL	<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	<DL	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	266	91	104	273	280	159	171	173	1%	157	51.9
Ammonia, Total (as N)	mg/L	0.75	-	0.005	***4.02***	0.0204	0.0085	0.021	0.215	0.112	0.449	0.427	5%	0.0705	***2.08***
Bromide (Br)	mg/L	-	-	0.05	<0.50	<0.25	<0.050	<0.25	<0.50	<0.25	<0.25	<0.25	<DL		<0.050
Chloride (Cl)	mg/L	120	-	0.5	<5.0	<2.5	<0.50	<2.5	<5.0	<2.5	<2.5	<2.5	<DL	0.57	0.71
Fluoride (F)	mg/L	0.12	-	0.02	<0.20	***0.21***	0.065	***0.18***	<0.20	<0.10	<0.10	<0.10	<DL	0.096	0.075
Nitrate (as N)	mg/L	13	-	0.005	0.668	<0.025	0.0064	<0.025	0.072	0.077	0.235	0.224	5%	0.537	0.0663
Nitrite (as N)	mg/L	0.06	-	0.001	0.012	<0.0050	<0.0010	<0.0050	<0.010	<0.0050	<0.0050	<0.0050	<DL	0.0065	0.0051
Sulfate (SO4)	mg/L	-	-	0.5	622	655	172	414	648	444	443	433	2%	358	200
Anion Sum	meq/L	-	-	-	18.3	15.5	5.67	14.1	19.1	12.4	12.7	12.5	<DL	10.6	5.23
Cation Sum	meq/L	-	-	-	18.4	15	5.74	14	19.1	12.4	12.9	12.9	<DL	10.7	5.14
Cation - Anion Balance	%	-	-	-	0.2	-1.6	0.6	-0.2	-0.1	0	0.9	1.6	<DL	0.2	-0.8
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	0.0094	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<DL	<0.0050	<0.0050
Cyanide, Total	mg/L	-	0.3	0.005	0.0197	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<DL	<0.0050	<0.0050
Cyanate	mg/L	-	-	0.2	<2.0	<0.20	<0.20	<0.20	0.21	<0.20	0.33	<0.20	<DL	<0.20	<0.20
Thiocyanate (SCN)	mg/L	-	-	0.5	4.64	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<DL	<0.50	<0.50
Aluminum (Al)-Total	mg/L	0.1	-	0.003	0.0177	0.0254	0.0236	0.0225	***3***	***2.91***	***1.73***	***2.09***	19%	0.0383	***11.2***
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.00041	0.0325	0.0012	0.00968	0.00781	0.00288	0.00206	0.0023	11%	0.00118	0.00928
Arsenic (As)-Total	mg/L	0.005	-	0.0001	***0.0523***	***0.105***	***0.00864***	***0.0355***	***0.0579***	***0.0301***	***0.0262***	***0.0276***	5%	***0.0136***	***0.173***
Barium (Ba)-Total	mg/L	-	1.0	0.00005	0.0658	0.0116	0.0427	0.0118	0.0866	0.0917	0.0733	0.0776	6%	0.0441	0.375
Beryllium (Be)-Total	mg/L	-	-	0.00002	<0.000020	<0.000020	<0.000020	<0.000020	0.000119	0.000105	0.000084	0.000083	<2xDL	<0.000020	0.0005
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.000050	0.000104	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<DL	<0.000050	0.00141
Boron (B)-Total	mg/L	-	-	0.01	0.045	0.067	<0.010	<0.010	0.03	0.013	0.016	0.016	<2xDL	0.016	<0.010
Cadmium (Cd)-Total *(Lab Result)*	mg/L	0.00009	0.02	0.00001	0.000366	***0.000528***	0.0000122	***0.00217***	***0.00127***	0.000326	0.000242	0.000253	4%	0.0000379	***0.00184***
Cadmium (Cd)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.00037*	*0.00037*	*0.00036*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	-	*0.00037*	*0.00032*
Calcium (Ca)-Total	mg/L	-	-	0.05	234	216	74.5	178	209	135	142	143	1%	133	77
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	<0.00060	<0.00010	0.00012	<0.00010	0.00455	0.00536	0.00319	0.00388	20%	0.00029	***0.0134***
Cobalt (Co)-Total	mg/L	-	-	0.0001	0.00717	0.00043	0.00032	0.00075	0.00294	0.00174	0.00179	0.00186	4%	0.00086	0.00779
Copper (Cu)-Total *(Lab Result)*	mg/L	0.002	0.2	0.0005	0.00297	***0.0204***	0.00123	<0.00050	***0.0168***	***0.00998***	***0.0069***	***0.00725***	5%	0.00131	***0.0383***
Copper (Cu)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.0040*	*0.0040*	*0.0040*	*0.0040*	*0.0040*	*0.0040*	*0.0040*	*0.0040*	-	*0.0040*	*0.0040*
Iron (Fe)-Total	mg/L	0.3	1	0.01	***6.64***	0.207	***1.07***	***0.339***	***7.2***	***6.69***	***5.01***	***5.64***	12%	***1.35***	***21.3***
Lead (Pb)-Total *(Lab Result)*	mg/L	0.001	0.1	0.00005	0.000059	***0.00849***	<0.000050	0.000185	***0.00708***	0.00401	0.00267	0.00299	11%	0.000143	***0.0738***
Lead (Pb)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00005*	*0.00700*	*0.00700*	*0.00700*	*0.00700*	*0.00700*	*0.00700*	*0.00700*	*0.00700*	-	*0.00700*	*0.00700*
Lithium (Li)-Total	mg/L	-	-	0.0005	<0.0010	0.0082	<0.0010	0.0084	0.0091	0.0044	0.0033	0.0035	6%	0.002	0.0089
Magnesium (Mg)-Total	mg/L	-	-	0.1	51.1	40.7	19.8	57.2	91.4	58.7	56.4	57	1%	48.4	20.1
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	***5.42***	0.112	0.247	***1.03***	***1.16***	0.454	***0.879***	***0.889***	1%	0.494	***1.71***
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	<0.0000050	0.0000097	<0.0000050	<0.0000050	0.000026	0.000025	<0.000025	<0.000025	<DL	<0.0000050	***0.000076***
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	0.000809	0.00121	0.000076	0.000294	0.000322	0.000439	0.000383	0.000449	16%	0.000333	0.00117
Nickel (Ni)-Total *(Lab Result)*	mg/L	0.025	0.3	0.0005	0.00301	0.00055	<0.00050	0.00152	0.00461	0.0041	0.003	0.0033	10%	0.00106	0.0103
Nickel (Ni)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.1500*	*0.1500*	*0.1500*	*0.1500*	*0.1500*	*0.1500*	*0.1500*	*0.1500*	-	*0.1500*	*0.1500*
Phosphorus (P)-Total	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	0.186	0.134	0.091	0.078	<2xDL	<0.050	0.365
Potassium (K)-Total	mg/L	-	-	0.1	5.36	13.9	4.86	3.29	4.16	2.54	2.73	3.25	17%	2.85	3.24
Selenium (Se)-Total	mg/L	0.001	-	0.0001	0.00025	<0.000050	0.000055	<0.000050	0.000177	0.000248	0.000201	0.000209	<2xDL	0.000067	0.000257
Silicon (Si)-Total	mg/L	-	-	0.05	7.11	3.12	5.09	6.53	9.89	10.4	8.75	9.51	8%	6.66	27.6
Silver (Ag)-Total	mg/L	0.00025	0.1	0.00001	0.000019	0.000217	<0.000010	<0.000010	0.000096	0.000105	0.000064	0.000083	**26%**	<0.000010	***0.00203***
Sodium (Na)-Total	mg/L	-	-	0.05	35.7	14.3	3.67	5.19	7.43	6.22	8.72	8.81	1%	10.1	6.78
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.671	0.576	0.237	0.415	0.549	0.424	0.433	0.445	3%	0.414	0.38
Sulfur (S)-Total	mg/L	-	-	0.5	200	212	58.3	134	204	136	139	147	6%	123	70.4
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	<0.000010	0.000158	<0.000010	0.000094	0.000099	0.000052	0.000033	0.000037	<2xDL	<0.000010	0.000187
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<DL	<0.00010	0.00015
Titanium (Ti)-Total	mg/L	-	-	0.0003	0.00105	<0.00030	0.00108	0.00161	0.141	0.134	0.0772	0.0953	**21%**	0.00136	0.273
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.00192	0.000897	0.000215	0.00406	0.00412	0.00211	0.00182	0.00188	3%	0.00134	0.00139
Vanadium (V)-Total	mg/L	-	-	0.0005	0.00185	<0.00050	<0.00050	<0.00050	0.0145	0.013	0.00869	0.00928	7%	0.00054	0.0339
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	***0.0348***	***0.0429***	0.006	***0.749***	***0.331***	***0.0436***	***0.0325***	***0.0326***	0%	0.0054	***0.201***
Zirconium (Zr)-Total	mg/L	-	-	0.0003	0.00049	<0.00030	<0.00030	<0.00030	<0.00030	0.00043	0.00037	0.00042	<2xDL	<0.00030	0.00052

Summary of Water Quality Results for the September 6 - 8, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1826266-1 WQ-SEEP 09/07/2016 14:30	L1826266-2 WQ-TP 09/07/2016 15:50	L1826266-3 WQ-DC-DX 09/07/2016 18:30	L1826266-4 WQ-DC-DX+105 09/07/2016 17:55	L1826266-5 WQ-DC-D1B 09/07/2016 17:25	L1826266-6 WQ-DC-B 09/07/2016 14:55	L1826266-7 WQ-DC-U 09/07/2016 13:30	L1826315-6 WQ-DC-U-r 09/07/2016 13:30	QA/QC WQ-DC-U Replicate Analysis	L1826331-1 WQ-DC-R 09/06/2016 17:00	L1826331-7 WQ-PC-U 09/07/2016 12:25
Aluminum (Al)-Dissolved	mg/L	0.1	-	0.001	0.0096	0.0039	0.0072	<0.0010	0.0079	0.0489	0.0449	0.0431	4%	0.0173	0.0128
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	0.00039	0.0344	0.00117	0.00941	0.00754	0.00189	0.00155	0.00154	1%	0.00113	0.00352
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	***0.0384***	***0.0865***	***0.00654***	***0.0129***	***0.014***	***0.00597***	***0.00966***	***0.00931***	4%	***0.00787***	***0.0144***
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0634	0.0118	0.0446	0.0112	0.0439	0.0546	0.0521	0.0502	4%	0.0458	0.12
Beryllium (Be)-Dissolved	mg/L	-	-	0.00002	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<DL	<0.000020	<0.000020
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<DL	<0.000050	<0.000050
Boron (B)-Dissolved	mg/L	-	-	0.01	0.042	0.059	<0.010	<0.010	0.026	0.012	0.014	0.015	<2xDL	0.014	<0.010
Cadmium (Cd)-Dissolved *(Lab Result)*	mg/L	0.00009	-	0.00001	0.000318	***0.000445***	0.000014	***0.00096***	0.0000818	0.0000132	0.0000147	0.0000105	<2xDL	0.0000286	0.0000767
Cadmium (Cd)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.00037*	*0.00037*	*0.00036*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	-	*0.00037*	*0.00032*
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	229	209	74.3	174	209	135	145	147	1%	122	67.1
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	0.00039	<0.00010	<0.00010	<0.00010	<0.00010	0.00016	0.00018	0.00016	<2xDL	0.00025	0.00011
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	0.00693	0.00036	0.0003	0.00068	0.00055	0.00038	0.00094	0.00088	7%	0.00085	0.00109
Copper (Cu)-Dissolved *(Lab Result)*	mg/L	0.002	-	0.0002	0.00213	***0.0166***	0.00107	<0.00020	0.00059	0.00104	0.00113	0.00105	7%	0.00121	0.0011
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*	*0.004*
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	***5.06***	0.012	***0.62***	0.098	0.293	***0.543***	***0.494***	***0.491***	1%	***0.419***	0.046
Lead (Pb)-Dissolved *(Lab Result)*	mg/L	0.001	-	0.00005	<0.000050	0.000372	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<DL	0.000051	0.000219
Lead (Pb)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00005*	*0.00700*	*0.00700*	*0.00700*	*0.00700*	*0.00700*	*0.00700*	*0.00700*	*0.00700*	-	*0.00700*	*0.00700*
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	0.0011	0.0087	<0.0010	0.0083	0.0075	0.0032	0.0027	0.0023	16%	0.0021	0.0025
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	55.6	43	20.5	60.3	99	64.7	62.2	60.7	2%	49.1	15.8
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	5.29	0.0949	0.247	0.983	0.894	0.406	0.888	0.839	6%	0.523	1.29
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<DL	<0.0000050	<0.0000050
Molybdenum (Mo)-Dissolved	mg/L	0.0073	-	0.00005	0.000883	0.00125	0.000067	0.000295	0.000276	0.000303	0.000357	0.000323	10%	0.000299	0.000861
Nickel (Ni)-Dissolved *(Lab Result)*	mg/L	0.025	-	0.0005	0.00288	0.00054	<0.00050	0.0015	0.00087	0.0008	0.00096	0.0009	<2xDL	0.00106	0.00086
Nickel (Ni)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.1500*	*0.1500*	*0.1500*	*0.1500*	*0.1500*	*0.1500*	*0.1500*	*0.1500*	-	*0.1500*	*0.1500*
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<DL	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	-	-	0.1	5.86	14.9	5.36	3.66	4.54	2.64	3.07	2.91	5%	2.5	1.49
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	0.000263	<0.000050	0.000055	<0.000050	0.000056	0.000087	0.000105	0.000087	<2xDL	0.000098	0.000114
Silicon (Si)-Dissolved	mg/L	-	-	0.05	7.25	3.11	5.11	6.54	5.96	6.61	6.56	6.47	1%	6.1	5.62
Silver (Ag)-Dissolved	mg/L	0.00025	-	0.00001	<0.000010	0.000041	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<DL	<0.000010	0.000029
Sodium (Na)-Dissolved	mg/L	-	-	0.05	33.6	14.4	3.78	4.88	7.15	6.3	9.33	9.02	3%	10.1	6
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.718	0.594	0.244	0.417	0.551	0.44	0.457	0.437	4%	0.405	0.392
Sulfur (S)-Dissolved	mg/L	-	-	0.5	215	228	60.9	137	215	151	153	149	3%	128	70.2
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	0.000146	<0.000010	0.000084	0.000018	<0.000010	<0.000010	<0.000010	<DL	<0.000010	<0.000010
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<DL	<0.00010	<0.00010
Titanium (Ti)-Dissolved	mg/L	-	-	0.0003	0.0007	<0.00030	<0.00030	<0.00030	<0.00030	0.00059	0.00066	0.00052	<2xDL	0.00058	0.00058
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.00187	0.000841	0.000202	0.00371	0.00314	0.00166	0.00155	0.00162	4%	0.00124	0.000576
Vanadium (V)-Dissolved	mg/L	-	-	0.001	0.00143	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00054	<0.00050	<DL	<0.00050	0.00055
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	***0.0353***	0.0297	0.0018	***0.734***	***0.147***	0.0063	0.005	0.0044	13%	0.01	0.0102
Zirconium (Zr)-Dissolved	mg/L	-	-	0.0003	0.00052	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<DL	<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-U-r was 6% with an average difference of 9% for total and 5% for dissolved metals. Total titanium had RPD>20%.

The average RPD of the replicate sample WQ-VC-UMN-r was 11% with an average difference of 17% for total and 3% for dissolved metals. Alkalinity (bicarbonate), nitrate, sulfate, total aluminum, total arsenic and total manganese had RPD>20%.

Summary of Water Quality Results for the September 6 - 8, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1826315-1 WQ-PC-D 09/07/2016 12:00	L1826331-6 WQ-BC 09/07/2016 10:35	L1826331-2 WQ-VC-U 09/07/2016 09:35	L1826331-4 WQ-VC-DBC 09/07/2016 09:10	L1826331-5 WQ-VC-UMN 09/06/2016 15:35	L1826315-5 WQ-VC-UMN-r 09/07/2016 15:50	QA/QC WQ-VC-UMN Replicate Analysis	L1826331-3 WQ-VC-R 09/06/2016 15:00	L1826315-2 WQ-CH-P-13-01 09/07/2016 16:40	L1826315-3 WQ-NW-SEEP-02 09/07/2016 08:40
Temperature (in-situ)	°C	-	-	-	4.9	4.9	3.4	3.4	5.7	5.7	-	5.1	1	7.8
Specific Conductivity (in-situ)	µS/cm	-	-	-	508.4	308.2	162.9	179.1	133.3	133.5	-	191.4	1585	539.3
pH (in-situ)	pH	6.5 - 9.0	6.0 - 8.5	-	7.89	8.14	7.72	7.68	7.94	7.96	-	7.84	6.47	7.89
Dissolved Oxygen (in-situ)	mg/L	-	-	-	9.27	9.62	9.48	9.51	9.22	9.21	-	9.46	9.85	7.15
Turbidity (In-situ)	NTU	-	-	-	550	653	1.82	16.61	3.72	3.72	-	4.19	0.75	11.99
Colour, True	CU	15	-	5							-			
Conductivity	µS/cm	-	-	2	504	300	162	175	208	173	18%	188	1530	487
Hardness (as CaCO3)	mg/L	-	-	0.5	246	151	79.8	85.5	101	103	2%	89.5	1010	266
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.51	7.88	7.91	7.91	7.99	7.92	1%	7.95	6.72	7.65
Total Suspended Solids	mg/L	-	50	3	***222***	***676***	<3.0	22.2	5.1	3.8	<2xDL	3.2	<3.0	21.3
Total Dissolved Solids	mg/L	-	-	1	333	186	88.7	97	118	130	10%	105	1330	340
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	53.4	83.8	73.7	74.9	78.8	64.2	**20%**	71.1	10.1	46.5
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<DL	<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	<DL	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	53.4	83.8	73.7	74.9	78.8	64.2	**20%**	71.1	10.1	46.5
Ammonia, Total (as N)	mg/L	0.75	-	0.005	***2.03***	0.19	<0.0050	0.0169	<0.0050	0.0052	<DL	0.0055	0.0075	<0.0050
Bromide (Br)	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050			<2xDL		<0.50	<0.050
Chloride (Cl)	mg/L	120	-	0.5	0.72	<0.50	<0.50	<0.50	<0.50	<0.50	<DL	<0.50	<5.0	0.68
Fluoride (F)	mg/L	0.12	-	0.02	0.079	0.076	0.051	0.052	0.057	0.086	<2xDL	0.059	<0.20	***0.363***
Nitrate (as N)	mg/L	13	-	0.005	0.0799	0.139	0.0678	0.0697	0.0707	0.116	**49%**	0.06	0.095	0.0307
Nitrite (as N)	mg/L	0.06	-	0.001	0.0052	0.0029	<0.0010	<0.0010	<0.0010	<0.0010	<DL	<0.0010	<0.010	<0.0010
Sulfate (SO4)	mg/L	-	-	0.5	200	75.6	13.6	19	32.3	51.9	**47%**	28.1	966	213
Anion Sum	meq/L	-	-	-	5.27	3.26	1.76	1.9	2.25	2.38	<DL	2.01	20.3	5.38
Cation Sum	meq/L	-	-	-	5.43	3.25	1.72	1.84	2.15	2.2	<DL	1.93	20.6	5.41
Cation - Anion Balance	%	-	-	-	1.5	-0.1	-1.3	-1.7	-2.3	-3.8	<DL	-2.2	0.7	0.3
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<DL	<0.0050	<0.0050	
Cyanide, Total	mg/L	-	0.3	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<DL	<0.0050	<0.0050	
Cyanate	mg/L	-	-	0.2	0.63	<0.20	<0.20	<0.20	<0.20	<0.20	<DL	<0.20	<0.20	
Thiocyanate (SCN)	mg/L	-	-	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<DL	<0.50	<0.50	<0.50
Aluminum (Al)-Total	mg/L	0.1	-	0.003	***9.49***	***12.8***	0.0453	***0.444***	***0.142***	0.0261	**138%**	***0.118***	***0.198***	***0.156***
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.00868	0.00271	<0.00010	0.00028	0.00021	0.00018	<2xDL	0.0002	0.00011	0.00399
Arsenic (As)-Total	mg/L	0.005	-	0.0001	***0.128***	***0.0668***	0.00037	0.00278	0.00165	0.0009	**59%**	0.00148	0.00051	***0.0169***
Barium (Ba)-Total	mg/L	-	1.0	0.00005	0.306	0.282	0.0596	0.0686	0.0612	0.0595	3%	0.0586	0.0124	0.00798
Beryllium (Be)-Total	mg/L	-	-	0.00002	0.000435	0.000472	<0.000020	<0.000020	<0.000020	<0.000020	<DL	<0.000020	0.000039	<0.000020
Bismuth (Bi)-Total	mg/L	-	-	0.0005	0.00103	0.000801	<0.000050	<0.000050	<0.000050	<0.000050	<DL	<0.000050	<0.000050	0.000107
Boron (B)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<DL	<0.010	<0.010	<0.010
Cadmium (Cd)-Total *(Lab Result)*	mg/L	0.00009	0.02	0.00001	***0.00179***	***0.00188***	0.0000212	0.0000562	0.0000333	0.000019	<2xDL	0.0000309	***0.0105***	***0.000481***
Cadmium (Cd)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.00033*	*0.00022*	*0.00013*	*0.00014*	*0.00016*	*0.00016*	-	*0.00014*	*0.00037*	*0.00036*
Calcium (Ca)-Total	mg/L	-	-	0.05	71.9	52.7	21.3	23.4	29.2	28.1	4%	25.1	241	81.9
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	***0.00996***	***0.0178***	0.00015	0.00063	0.00033	0.00028	<2xDL	0.00028	0.00016	0.00018
Cobalt (Co)-Total	mg/L	-	-	0.0001	0.006	0.00912	<0.00010	0.00033	0.00018	0.00011	<2xDL	0.00018	<0.00010	<0.00010
Copper (Cu)-Total *(Lab Result)*	mg/L	0.002	0.2	0.0005	***0.031***	***0.0314***	0.00148	***0.00227***	0.00177	0.00148	<2xDL	0.0021	0.00112	***0.0231***
Copper (Cu)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.0040*	*0.0034*	*0.0020*	*0.0021*	*0.0024*	*0.0024*	-	*0.0022*	*0.0040*	*0.0040*
Iron (Fe)-Total	mg/L	0.3	1	0.01	***15.6***	***22.9***	0.12	***0.707***	0.253	0.247	2%	***0.325***	0.041	***0.416***
Lead (Pb)-Total *(Lab Result)*	mg/L	0.001	0.1	0.00005	***0.0625***	***0.0584***	<0.000050	0.00144	0.000424	<0.000050	<DL	0.000393	<0.000050	0.00574
Lead (Pb)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00005*	*0.00700*	*0.00538*	*0.00239*	*0.00261*	*0.00322*	*0.00330*	-	*0.00276*	*0.00700*	*0.00700*
Lithium (Li)-Total	mg/L	-	-	0.0005	0.0082	0.01	<0.0010	<0.0010	<0.0010	<0.0010	<DL	<0.0010	0.0015	0.0014
Magnesium (Mg)-Total	mg/L	-	-	0.1	18.4	16.2	6.97	7.44	8.78	8.81	0%	8.17	88.4	15.5
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	***1.53***	***1.07***	0.0276	0.071	0.0638	0.0515	**21%**	0.0566	0.227	0.0168
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	***0.000067***	***0.000065***	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<DL	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	0.00107	0.00156	0.000341	0.000398	0.000418	0.000424	1%	0.000383	<0.000050	0.000176
Nickel (Ni)-Total *(Lab Result)*	mg/L	0.025	0.3	0.0005	0.00806	0.0125	<0.00050	0.0008	0.00059	<0.00050	<DL	0.00076	0.00781	<0.00050
Nickel (Ni)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.1500*	*0.1307*	*0.0805*	*0.0848*	*0.0963*	*0.0977*	-	*0.0878*	*0.1500*	*0.1500*
Phosphorus (P)-Total	mg/L	-	-	0.05	0.283	0.569	<0.050	<0.050	<0.050	<0.050	<DL	<0.050	<0.050	<0.050
Potassium (K)-Total	mg/L	-	-	0.1	3.21	3.28	0.55	0.69	0.68	0.66	3%	0.72	0.43	1.69
Selenium (Se)-Total	mg/L	0.001	-	0.0001	0.000235	0.000269	<0.000050	0.00005	<0.000050	0.000064	<DL	0.000052	0.000074	0.000059
Silicon (Si)-Total	mg/L	-	-	0.05	24.3	30.4	6.52	7.28	6.5	6.42	1%	6.92	9.17	3.05
Silver (Ag)-Total	mg/L	0.00025	0.1	0.00001	***0.00141***	***0.00115***	<0.000010	0.000027	<0.000010	<0.000010	<DL	<0.000010	<0.000010	0.000127
Sodium (Na)-Total	mg/L	-	-	0.05	6.42	4.61	2.3	2.44	2.9	2.9	0%	2.6	6.3	0.986
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.373	0.321	0.239	0.239	0.261	0.252	4%	0.228	0.505	0.165
Sulfur (S)-Total	mg/L	-	-	0.5	68.1	27.1	4.77	6.71	11.3	11.4	1%	9.52	324	75.8
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	0.000165	0.00024	<0.000010	<0.000010	<0.000010	<0.000010	<DL	<0.000010	<0.000010	0.000026
Tin (Sn)-Total	mg/L	-	-	0.0001	0.00018	0.00021	<0.00010	<0.00010	<0.00010	<0.00010	<DL	<0.00010	<0.00010	0.00012
Titanium (Ti)-Total	mg/L	-	-	0.0003	0.24	0.495	0.00068	0.0155	0.00437	<0.00030	<DL	0.00339	0.00049	0.00196
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.00126	0.00341	0.000383	0.000483	0.00049	0.000479	2%	0.000462	<0.000010	0.000215
Vanadium (V)-Total	mg/L	-	-	0.0005	0.0269	0.0416	<0.00050	0.00147	0.00079	<0.00050	<DL	0.00057	<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	***0.172***	***0.141***	<0.0030	0.0059	0.0047	<0.0030	<DL	<0.0030	***3.81***	***0.0329***
Zirconium (Zr)-Total	mg/L	-	-	0.0003	0.00118	0.00092	<0.00030	<0.00030	<0.00030	<0.00030	<DL	<0.00030	<0.00030	<0.00030

Summary of Water Quality Results for the September 6 - 8, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1826315-1 WQ-PC-D 09/07/2016 12:00	L1826331-6 WQ-BC 09/06/2016 10:35	L1826331-2 WQ-VC-U 09/06/2016 09:35	L1826331-4 WQ-VC-DBC 09/07/2016 09:10	L1826331-5 WQ-VC-UMN 09/06/2016 15:35	L1826315-5 WQ-VC-UMN-r 09/07/2016 15:50	QA/QC WQ-VC-UMN Replicate Analysis	L1826331-3 WQ-VC-R 09/06/2016 15:00	L1826315-2 WQ-CH-P-13-01 09/07/2016 16:40	L1826315-3 WQ-NW-SEEP-02 09/07/2016 08:40
Aluminum (Al)-Dissolved	mg/L	0.1	-	0.001	0.0144	0.0324	0.0294	0.028	0.0256	0.0256	0%	0.0352	***0.171***	0.0095
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	0.00351	0.00063	<0.00010	0.00014	0.00017	0.00015	<2xDL	0.00016	0.00011	0.00287
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	***0.0149***	0.00404	0.00038	0.00072	0.00092	0.00091	1%	0.00094	0.00043	***0.00828***
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.119	0.0625	0.0642	0.0601	0.0603	0.0608	1%	0.0586	0.0116	0.0051
Beryllium (Be)-Dissolved	mg/L	-	-	0.00002	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<DL	<0.000020	0.000036	<0.000020
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<DL	<0.000050	<0.000050	<0.000050
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<DL	<0.010	<0.010	<0.010
Cadmium (Cd)-Dissolved *(Lab Result)*	mg/L	0.00009	-	0.00001	0.000127	0.0000805	0.0000175	0.000024	0.0000209	0.0000179	<2xDL	0.0000202	***0.0101***	0.000348
Cadmium (Cd)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.00033*	*0.00022*	*0.00013*	*0.00014*	*0.00016*	*0.00016*	*0.00004*	*0.00014*	*0.00037*	*0.00036*
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	71.2	43.2	20.8	22.6	26.5	26.9	1%	23.7	250	80.3
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	<0.00010	0.00031	0.00013	0.00013	<0.00010	0.00022	<DL	0.00017	<0.00010	<0.00010
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	0.00095	0.0003	<0.00010	0.0001	0.0001	0.00011	<2xDL	0.00013	<0.00010	<0.00010
Copper (Cu)-Dissolved *(Lab Result)*	mg/L	0.002	-	0.0002	0.00158	0.00207	0.00144	0.00146	0.00137	0.00144	5%	0.00153	0.00084	***0.0108***
Copper (Cu)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.002*	*0.004*	*0.003*	*0.002*	*0.002*	*0.002*	*0.002*	*0.002*	*0.002*	*0.004*	*0.004*
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	0.035	0.101	0.066	0.067	0.06	0.065	8%	0.11	0.027	<0.010
Lead (Pb)-Dissolved *(Lab Result)*	mg/L	0.001	-	0.00005	0.000193	0.000393	<0.000050	<0.000050	<0.000050	<0.000050	<DL	<0.000050	<0.000050	<0.000050
Lead (Pb)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00005*	*0.00700*	*0.00538*	*0.00239*	*0.00261*	*0.00322*	*0.00330*	*0.00100*	*0.00276*	*0.00700*	*0.00700*
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	0.0022	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	<DL	<0.0010	0.0016	0.0017
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	16.7	10.6	6.75	7.05	8.38	8.63	3%	7.35	93.8	15.9
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	1.31	0.382	0.0258	0.0613	0.0537	0.0523	3%	0.0513	0.203	0.00027
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<DL	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Dissolved	mg/L	0.0073	-	0.00005	0.000711	0.00104	0.000317	0.000375	0.000377	0.000394	4%	0.000345	<0.000050	<0.00025
Nickel (Ni)-Dissolved *(Lab Result)*	mg/L	0.025	-	0.0005	0.00084	0.00071	<0.00050	<0.00050	<0.00050	<0.00050	<DL	0.00065	0.0076	<0.00050
Nickel (Ni)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.1500*	*0.1307*	*0.0805*	*0.0848*	*0.0963*	*0.0977*	-	*0.0878*	*0.1500*	*0.1500*
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<DL	<0.050	<0.050	<0.050
Potassium (K)-Dissolved	mg/L	-	-	0.1	1.68	1.06	0.53	0.58	0.62	0.66	6%	0.59	0.45	1.76
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	0.000089	0.000064	<0.000050	0.000063	<0.000050	0.000056	<DL	0.000059	<0.000050	<0.000050
Silicon (Si)-Dissolved	mg/L	-	-	0.05	5.9	7.19	6.22	6.21	5.99	6.24	4%	6.2	9.46	2.79
Silver (Ag)-Dissolved	mg/L	0.00025	-	0.00001	<0.000010	0.000013	<0.000010	<0.000010	<0.000010	<0.000010	<DL	<0.000010	<0.000010	<0.000010
Sodium (Na)-Dissolved	mg/L	-	-	0.05	6.15	3.84	2.35	2.36	2.65	2.84	7%	2.52	6.02	1.09
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.343	0.276	0.233	0.238	0.246	0.252	2%	0.222	0.548	0.167
Sulfur (S)-Dissolved	mg/L	-	-	0.5	70.5	27.1	4.86	7.2	11.4	11	4%	9.83	323	70.4
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<DL	<0.000010	<0.000010	0.000012
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<DL	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Dissolved	mg/L	-	-	0.0003	0.00051	0.00105	<0.00030	<0.00030	<0.00030	<0.00030	<DL	0.00036	<0.00030	<0.00030
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.000555	0.0014	0.000342	0.000426	0.000467	0.000464	1%	0.000405	0.00001	0.000192
Vanadium (V)-Dissolved	mg/L	-	-	0.001	0.00063	0.00089	<0.00050	<0.00050	<0.00050	<0.00050	<DL	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	0.0117	0.0016	0.0012	0.0018	0.0017	0.0016	<2xDL	0.0024	***3.75***	0.0136
Zirconium (Zr)-Dissolved	mg/L	-	-	0.0003	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<DL	<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 September 6 - 8, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1826293-1 WQ-PW 09/07/2016 11:30	L1826315-7 FIELD BLANK 09/07/2016 12:25	L1826315-4 TRAVEL BLANK
Temperature (in-situ)	°C	-	-	-	0.2		
Specific Conductivity (in-situ)	µS/cm	-	-	-	360.8		
pH (in-situ)	pH	6.5 - 9.0	6.0 - 8.5	-	7.52		
Dissolved Oxygen (in-situ)	mg/L	-	-	-	7.82		
Turbidity (In-situ)	NTU	-	-	-	0.5		
Colour, True	CU	15	-	5	<5.0		
Conductivity	µS/cm	-	-	2	363	<2.0	<2.0
Hardness (as CaCO3)	mg/L	-	-	0.5	187	<0.50	
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.99	***5.29***	***5.68***
Total Suspended Solids	mg/L	-	50	3		<3.0	<3.0
Total Dissolved Solids	mg/L	-	-	1	219	<1.0	<1.0
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1		<1.0	<1.0
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1		<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1		<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	164	<1.0	<1.0
Ammonia, Total (as N)	mg/L	0.75	-	0.005		<0.0050	<0.0050
Bromide (Br)	mg/L	-	-	0.05		<0.050	<0.050
Chloride (Cl)	mg/L	120	-	0.5	<0.50	<0.50	<0.50
Fluoride (F)	mg/L	0.12	-	0.02	0.1	<0.020	<0.020
Nitrate (as N)	mg/L	13	-	0.005	0.126	<0.0050	<0.0050
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010	<0.0010	<0.0010
Sulfate (SO4)	mg/L	-	-	0.5	32.1	<0.30	<0.30
Anion Sum	meq/L	-	-	-		<0.10	<0.10
Cation Sum	meq/L	-	-	-		<0.10	<0.10
Cation - Anion Balance	%	-	-	-		0	0
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005		<0.0050	<0.0050
Cyanide, Total	mg/L	-	0.3	0.005		<0.0050	<0.0050
Cyanate	mg/L	-	-	0.2		<0.20	
Thiocyanate (SCN)	mg/L	-	-	0.5		<0.50	<0.50
Aluminum (Al)-Total	mg/L	0.1	-	0.003	<0.010	<0.0030	<0.0030
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	<0.00050	<0.00010	<0.00010
Arsenic (As)-Total	mg/L	0.005	-	0.0001	0.00039	<0.00010	<0.00010
Barium (Ba)-Total	mg/L	-	1.0	0.00005	0.084	<0.000050	<0.000050
Beryllium (Be)-Total	mg/L	-	-	0.00002		<0.000020	<0.000020
Bismuth (Bi)-Total	mg/L	-	-	0.0005		<0.000050	<0.000050
Boron (B)-Total	mg/L	-	-	0.01	<0.10	<0.010	<0.010
Cadmium (Cd)-Total *(Lab Result)*	mg/L	0.00009	0.02	0.00001	<0.00020	<0.0000050	<0.0000050
Cadmium (Cd)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.00027*	*0.00037*	*0.00004*
Calcium (Ca)-Total	mg/L	-	-	0.05	41.6	<0.050	<0.050
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	<0.0020	<0.00010	<0.00010
Cobalt (Co)-Total	mg/L	-	-	0.0001		<0.00010	<0.00010
Copper (Cu)-Total *(Lab Result)*	mg/L	0.002	0.2	0.0005	<0.0010	<0.00050	<0.00050
Copper (Cu)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.0040*	*0.0040*	*0.0020*
Iron (Fe)-Total	mg/L	0.3	1	0.01	<0.030	<0.010	<0.010
Lead (Pb)-Total *(Lab Result)*	mg/L	0.001	0.1	0.00005	0.00062	<0.000050	<0.000050
Lead (Pb)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00005*	*0.00700*	*0.00700*	*0.00100*
Lithium (Li)-Total	mg/L	-	-	0.0005		<0.0010	<0.0010
Magnesium (Mg)-Total	mg/L	-	-	0.1	20.2	<0.10	<0.10
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	<0.0020	<0.00010	<0.00010
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	<0.00020	<0.0000050	<0.0000050
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005		<0.000050	<0.000050
Nickel (Ni)-Total *(Lab Result)*	mg/L	0.025	0.3	0.0005		<0.00050	<0.00050
Nickel (Ni)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	-	*0.1500*	*0.0250*
Phosphorus (P)-Total	mg/L	-	-	0.05		<0.050	<0.050
Potassium (K)-Total	mg/L	-	-	0.1	0.9	<0.10	<0.10
Selenium (Se)-Total	mg/L	0.001	-	0.0001	<0.0010	<0.000050	<0.000050
Silicon (Si)-Total	mg/L	-	-	0.05		<0.050	<0.050
Silver (Ag)-Total	mg/L	0.00025	0.1	0.00001		<0.000010	<0.000010
Sodium (Na)-Total	mg/L	-	-	0.05	4.8	<0.050	<0.050
Strontium (Sr)-Total	mg/L	-	-	0.0002		<0.00020	<0.00020
Sulfur (S)-Total	mg/L	-	-	0.5		<0.50	<0.50
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001		<0.000010	<0.000010
Tin (Sn)-Total	mg/L	-	-	0.0001		<0.00010	<0.00010
Titanium (Ti)-Total	mg/L	-	-	0.0003	0.00177	<0.00030	<0.00030
Uranium (U)-Total	mg/L	0.015	-	0.00001		<0.000010	<0.000010
Vanadium (V)-Total	mg/L	-	-	0.0005		<0.00050	<0.00050
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	<0.050	<0.0030	<0.0030
Zirconium (Zr)-Total	mg/L	-	-	0.0003		<0.00030	<0.00030

Summary of Water Quality Results for the September 6 - 8, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1826293-1 WQ-PW 09/07/2016 11:30	L1826315-7 FIELD BLANK 09/07/2016 12:25	L1826315-4 TRAVEL BLANK
Aluminum (Al)-Dissolved	mg/L	0.1	-	0.001		<0.0010	
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001		<0.00010	
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001		<0.00010	
Barium (Ba)-Dissolved	mg/L	-	-	0.00005		<0.000050	
Beryllium (Be)-Dissolved	mg/L	-	-	0.00002		<0.000020	
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005		<0.000050	
Boron (B)-Dissolved	mg/L	-	-	0.01		<0.010	
Cadmium (Cd)-Dissolved *(Lab Result)*	mg/L	0.00009	-	0.00001		<0.0000050	
Cadmium (Cd)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	-	*0.00037*	-
Calcium (Ca)-Dissolved	mg/L	-	-	0.05		<0.050	
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001		<0.00010	
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001		<0.00010	
Copper (Cu)-Dissolved *(Lab Result)*	mg/L	0.002	-	0.0002		<0.00020	
Copper (Cu)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.002*	-	*0.004*	-
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01		<0.010	
Lead (Pb)-Dissolved *(Lab Result)*	mg/L	0.001	-	0.00005		<0.000050	
Lead (Pb)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00005*	-	*0.00700*	-
Lithium (Li)-Dissolved	mg/L	-	-	0.0005		<0.0010	
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1		<0.10	
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005		<0.00010	
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001		<0.0000050	
Molybdenum (Mo)-Dissolved	mg/L	0.0073	-	0.00005		<0.000050	
Nickel (Ni)-Dissolved *(Lab Result)*	mg/L	0.025	-	0.0005		<0.00050	
Nickel (Ni)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	-	*0.1500*	-
Phosphorus (P)-Dissolved	mg/L	-	-	0.05		<0.050	
Potassium (K)-Dissolved	mg/L	-	-	0.1		<0.10	
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001		<0.000050	
Silicon (Si)-Dissolved	mg/L	-	-	0.05		<0.050	
Silver (Ag)-Dissolved	mg/L	0.00025	-	0.00001		<0.000010	
Sodium (Na)-Dissolved	mg/L	-	-	0.05		<0.050	
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002		<0.00020	
Sulfur (S)-Dissolved	mg/L	-	-	0.5		<0.50	
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001		<0.000010	
Tin (Sn)-Dissolved	mg/L	-	-	0.0001		<0.00010	
Titanium (Ti)-Dissolved	mg/L	-	-	0.0003		<0.00030	
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001		<0.000010	
Vanadium (V)-Dissolved	mg/L	-	-	0.001		<0.00050	
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001		<0.0010	
Zirconium (Zr)-Dissolved	mg/L	-	-	0.0003		<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: 08-SEP-16
Report Date: 21-SEP-16 18:12 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1826266

Project P.O. #: NOT SUBMITTED
Job Reference: MOUNT NANSEN 16-Y0089
C of C Numbers: 1, 2
Legal Site Desc:

Can Dang
Senior Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1826266-1 water 07-SEP-16 14:30 WQ-SEEP	L1826266-2 water 07-SEP-16 15:50 WQ-TP	L1826266-3 water 07-SEP-16 18:30 WQ-DC-DX	L1826266-4 water 07-SEP-16 17:55 WQ-DC-DX+105	L1826266-5 water 07-SEP-16 17:25 WQ-DC-D1B
WATER						
Physical Tests	Conductivity (uS/cm)	1430	1220	513	1110	1430
	Hardness (as CaCO3) (mg/L)	802	699	270	684	929
	pH (pH)	7.47	8.02	7.69	7.53	8.10
	Total Suspended Solids (mg/L)	20.8	9.9	11.8	6.6	266
	TDS (Calculated) (mg/L)	1120	992	340	823	1140
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	266	91.0	104	273	280
	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)	266	91.0	104	273	280
	Ammonia, Total (as N) (mg/L)	4.02	0.0204	0.0085	0.0210	0.215
	Bromide (Br) (mg/L)	<0.50 DLDS	<0.25 DLDS	<0.050	<0.25 DLDS	<0.50 DLDS
	Chloride (Cl) (mg/L)	<5.0 DLDS	<2.5 DLDS	<0.50	<2.5 DLDS	<5.0 DLDS
	Fluoride (F) (mg/L)	<0.20 DLDS	0.21	0.065	0.18	<0.20 DLDS
	Nitrate (as N) (mg/L)	0.668	<0.025 DLDS	0.0064	<0.025 DLDS	0.072
	Nitrite (as N) (mg/L)	0.012	<0.0050 DLDS	<0.0010	<0.0050 DLDS	<0.010 DLDS
	Sulfate (SO4) (mg/L)	622	655	172	414	648
	Anion Sum (meq/L)	18.3	15.5	5.67	14.1	19.1
	Cation Sum (meq/L)	18.4	15.0	5.74	14.0	19.1
	Cation - Anion Balance (%)	0.2	-1.6	0.6	-0.2	-0.1
Cyanides	Cyanide, Weak Acid Diss (mg/L)	0.0094	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	0.0197	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanate (mg/L)	<2.0 DLIS	<0.20	<0.20	<0.20	0.21
	Thiocyanate (SCN) (mg/L)	4.64	<0.50	<0.50	<0.50	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	0.0177	0.0254	0.0236	0.0225	3.00
	Antimony (Sb)-Total (mg/L)	0.00041	0.0325	0.00120	0.00968	0.00781
	Arsenic (As)-Total (mg/L)	0.0523	0.105	0.00864	0.0355	0.0579
	Barium (Ba)-Total (mg/L)	0.0658	0.0116	0.0427	0.0118	0.0866
	Beryllium (Be)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	0.000119
	Bismuth (Bi)-Total (mg/L)	<0.000050	0.000104	<0.000050	<0.000050	<0.000050
	Boron (B)-Total (mg/L)	0.045	0.067	<0.010	<0.010	0.030
	Cadmium (Cd)-Total (mg/L)	0.000366	0.000528	0.0000122	0.00217	0.00127
	Calcium (Ca)-Total (mg/L)	234	216	74.5	178	209
	Chromium (Cr)-Total (mg/L)	<0.00060 DLB	<0.00010	0.00012	<0.00010	0.00455
	Cobalt (Co)-Total (mg/L)	0.00717	0.00043	0.00032	0.00075	0.00294
	Copper (Cu)-Total (mg/L)	0.00297	0.0204	0.00123	<0.00050	0.0168
	Iron (Fe)-Total (mg/L)	6.64	0.207	1.07	0.339	7.20
	Lead (Pb)-Total (mg/L)	0.000059	0.00849	<0.000050	0.000185	0.00708

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1826266-6	L1826266-7			
	Description	water	water			
	Sampled Date	07-SEP-16	07-SEP-16			
	Sampled Time	14:55	13:30			
	Client ID	WQ-DC-B	WQ-U			
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	1000	1030			
	Hardness (as CaCO3) (mg/L)	603	617			
	pH (pH)	7.93	8.06			
	Total Suspended Solids (mg/L)	186	121			
	TDS (Calculated) (mg/L)	750	768			
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	159	171			
	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)	159	171			
	Ammonia, Total (as N) (mg/L)	0.112	0.449			
	Bromide (Br) (mg/L)	<0.25 DLDS	<0.25 DLDS			
	Chloride (Cl) (mg/L)	<2.5 DLDS	<2.5 DLDS			
	Fluoride (F) (mg/L)	<0.10 DLDS	<0.10 DLDS			
	Nitrate (as N) (mg/L)	0.077	0.235			
	Nitrite (as N) (mg/L)	<0.0050 DLDS	<0.0050 DLDS			
	Sulfate (SO4) (mg/L)	444	443			
	Anion Sum (meq/L)	12.4	12.7			
	Cation Sum (meq/L)	12.4	12.9			
	Cation - Anion Balance (%)	0.0	0.9			
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050			
	Cyanide, Total (mg/L)	<0.0050	<0.0050			
	Cyanate (mg/L)	<0.20	0.33			
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50			
Total Metals	Aluminum (Al)-Total (mg/L)	2.91	1.73			
	Antimony (Sb)-Total (mg/L)	0.00288	0.00206			
	Arsenic (As)-Total (mg/L)	0.0301	0.0262			
	Barium (Ba)-Total (mg/L)	0.0917	0.0733			
	Beryllium (Be)-Total (mg/L)	0.000105	0.000084			
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050			
	Boron (B)-Total (mg/L)	0.013	0.016			
	Cadmium (Cd)-Total (mg/L)	0.000326	0.000242			
	Calcium (Ca)-Total (mg/L)	135	142			
	Chromium (Cr)-Total (mg/L)	0.00536	0.00319			
	Cobalt (Co)-Total (mg/L)	0.00174	0.00179			
	Copper (Cu)-Total (mg/L)	0.00998	0.00690			
	Iron (Fe)-Total (mg/L)	6.69	5.01			
	Lead (Pb)-Total (mg/L)	0.00401	0.00267			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1826266-1 water 07-SEP-16 14:30 WQ-SEEP	L1826266-2 water 07-SEP-16 15:50 WQ-TP	L1826266-3 water 07-SEP-16 18:30 WQ-DC-DX	L1826266-4 water 07-SEP-16 17:55 WQ-DC-DX+105	L1826266-5 water 07-SEP-16 17:25 WQ-DC-D1B
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0010	0.0082	<0.0010	0.0084	0.0091
	Magnesium (Mg)-Total (mg/L)	51.1	40.7	19.8	57.2	91.4
	Manganese (Mn)-Total (mg/L)	5.42	0.112	0.247	1.03	1.16
	Mercury (Hg)-Total (mg/L)	<0.0000050	0.0000097	<0.0000050	<0.0000050	0.000026
	Molybdenum (Mo)-Total (mg/L)	0.000809	0.00121	0.000076	0.000294	0.000322
	Nickel (Ni)-Total (mg/L)	0.00301	0.00055	<0.00050	0.00152	0.00461
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	0.186
	Potassium (K)-Total (mg/L)	5.36	13.9	4.86	3.29	4.16
	Selenium (Se)-Total (mg/L)	0.000250	<0.000050	0.000055	<0.000050	0.000177
	Silicon (Si)-Total (mg/L)	7.11	3.12	5.09	6.53	9.89
	Silver (Ag)-Total (mg/L)	0.000019	0.000217	<0.000010	<0.000010	0.000096
	Sodium (Na)-Total (mg/L)	35.7	14.3	3.67	5.19	7.43
	Strontium (Sr)-Total (mg/L)	0.671	0.576	0.237	0.415	0.549
	Sulfur (S)-Total (mg/L)	200	212	58.3	134	204
	Thallium (Tl)-Total (mg/L)	<0.000010	0.000158	<0.000010	0.000094	0.000099
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	0.00105	<0.00030	0.00108	0.00161	0.141
	Uranium (U)-Total (mg/L)	0.00192	0.000897	0.000215	0.00406	0.00412
	Vanadium (V)-Total (mg/L)	0.00185	<0.00050	<0.00050	<0.00050	0.0145
	Zinc (Zn)-Total (mg/L)	0.0348	0.0429	0.0060	0.749	0.331
	Zirconium (Zr)-Total (mg/L)	0.00049	<0.00030	<0.00030	<0.00030	<0.00030
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0096	0.0039	0.0072	<0.0010	0.0079
	Antimony (Sb)-Dissolved (mg/L)	0.00039	0.0344	0.00117	0.00941	0.00754
	Arsenic (As)-Dissolved (mg/L)	0.0384	0.0865	0.00654	0.0129	0.0140
	Barium (Ba)-Dissolved (mg/L)	0.0634	0.0118	0.0446	0.0112	0.0439
	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)	0.042	0.059	<0.010	<0.010	0.026
	Cadmium (Cd)-Dissolved (mg/L)	0.000318	0.000445	0.0000140	0.000960	0.0000818
	Calcium (Ca)-Dissolved (mg/L)	229	209	74.3	174	209
	Chromium (Cr)-Dissolved (mg/L)	0.00039	<0.00010	<0.00010	<0.00010	<0.00010
	Cobalt (Co)-Dissolved (mg/L)	0.00693	0.00036	0.00030	0.00068	0.00055
	Copper (Cu)-Dissolved (mg/L)	0.00213	0.0166	0.00107	<0.00020	0.00059
	Iron (Fe)-Dissolved (mg/L)	5.06	0.012	0.620	0.098	0.293
	Lead (Pb)-Dissolved (mg/L)	<0.000050	0.000372	<0.000050	<0.000050	<0.000050

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1826266-6	L1826266-7			
	Description	water	water			
	Sampled Date	07-SEP-16	07-SEP-16			
	Sampled Time	14:55	13:30			
	Client ID	WQ-DC-B	WQ-U			
Grouping	**Analyte**					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	0.0044	0.0033			
	Magnesium (Mg)-Total (mg/L)	58.7	56.4			
	Manganese (Mn)-Total (mg/L)	0.454	0.879			
	Mercury (Hg)-Total (mg/L)	0.000025	<0.000025 DLM			
	Molybdenum (Mo)-Total (mg/L)	0.000439	0.000383			
	Nickel (Ni)-Total (mg/L)	0.00410	0.00300			
	Phosphorus (P)-Total (mg/L)	0.134	0.091			
	Potassium (K)-Total (mg/L)	2.54	2.73			
	Selenium (Se)-Total (mg/L)	0.000248	0.000201			
	Silicon (Si)-Total (mg/L)	10.4	8.75			
	Silver (Ag)-Total (mg/L)	0.000105	0.000064			
	Sodium (Na)-Total (mg/L)	6.22	8.72			
	Strontium (Sr)-Total (mg/L)	0.424	0.433			
	Sulfur (S)-Total (mg/L)	136	139			
	Thallium (Tl)-Total (mg/L)	0.000052	0.000033			
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010			
	Titanium (Ti)-Total (mg/L)	0.134	0.0772			
	Uranium (U)-Total (mg/L)	0.00211	0.00182			
	Vanadium (V)-Total (mg/L)	0.0130	0.00869			
	Zinc (Zn)-Total (mg/L)	0.0436	0.0325			
	Zirconium (Zr)-Total (mg/L)	0.00043	0.00037			
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD			
	Dissolved Metals Filtration Location	FIELD	FIELD			
	Aluminum (Al)-Dissolved (mg/L)	0.0489	0.0449			
	Antimony (Sb)-Dissolved (mg/L)	0.00189	0.00155			
	Arsenic (As)-Dissolved (mg/L)	0.00597	0.00966			
	Barium (Ba)-Dissolved (mg/L)	0.0546	0.0521			
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020			
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050			
	Boron (B)-Dissolved (mg/L)	0.012	0.014			
	Cadmium (Cd)-Dissolved (mg/L)	0.0000132	0.0000147			
	Calcium (Ca)-Dissolved (mg/L)	135	145			
	Chromium (Cr)-Dissolved (mg/L)	0.00016	0.00018			
	Cobalt (Co)-Dissolved (mg/L)	0.00038	0.00094			
	Copper (Cu)-Dissolved (mg/L)	0.00104	0.00113			
	Iron (Fe)-Dissolved (mg/L)	0.543	0.494			
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1826266-1 water 07-SEP-16 14:30 WQ-SEEP	L1826266-2 water 07-SEP-16 15:50 WQ-TP	L1826266-3 water 07-SEP-16 18:30 WQ-DC-DX	L1826266-4 water 07-SEP-16 17:55 WQ-DC-DX+105	L1826266-5 water 07-SEP-16 17:25 WQ-DC-D1B
WATER						
Dissolved Metals	Lithium (Li)-Dissolved (mg/L)	0.0011	0.0087	<0.0010	0.0083	0.0075
	Magnesium (Mg)-Dissolved (mg/L)	55.6	43.0	20.5	60.3	99.0
	Manganese (Mn)-Dissolved (mg/L)	5.29	0.0949	0.247	0.983	0.894
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.000883	0.00125	0.000067	0.000295	0.000276
	Nickel (Ni)-Dissolved (mg/L)	0.00288	0.00054	<0.00050	0.00150	0.00087
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	5.86	14.9	5.36	3.66	4.54
	Selenium (Se)-Dissolved (mg/L)	0.000263	<0.000050	0.000055	<0.000050	0.000056
	Silicon (Si)-Dissolved (mg/L)	7.25	3.11	5.11	6.54	5.96
	Silver (Ag)-Dissolved (mg/L)	<0.000010	0.000041	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	33.6	14.4	3.78	4.88	7.15
	Strontium (Sr)-Dissolved (mg/L)	0.718	0.594	0.244	0.417	0.551
	Sulfur (S)-Dissolved (mg/L)	215	228	60.9	137	215
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	0.000146	<0.000010	0.000084	0.000018
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	0.00070	<0.00030	<0.00030	<0.00030	<0.00030
	Uranium (U)-Dissolved (mg/L)	0.00187	0.000841	0.000202	0.00371	0.00314
	Vanadium (V)-Dissolved (mg/L)	0.00143	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)	0.0353	0.0297	0.0018	0.734	0.147
	Zirconium (Zr)-Dissolved (mg/L)	0.00052	<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	L1826266-6	L1826266-7			
	Description	water	water			
	Sampled Date	07-SEP-16	07-SEP-16			
	Sampled Time	14:55	13:30			
	Client ID	WQ-DC-B	WQ-U			
Grouping	**Analyte**					
WATER						
Dissolved Metals	Lithium (Li)-Dissolved (mg/L)	0.0032	0.0027			
	Magnesium (Mg)-Dissolved (mg/L)	64.7	62.2			
	Manganese (Mn)-Dissolved (mg/L)	0.406	0.888			
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050			
	Molybdenum (Mo)-Dissolved (mg/L)	0.000303	0.000357			
	Nickel (Ni)-Dissolved (mg/L)	0.00080	0.00096			
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050			
	Potassium (K)-Dissolved (mg/L)	2.64	3.07			
	Selenium (Se)-Dissolved (mg/L)	0.000087	0.000105			
	Silicon (Si)-Dissolved (mg/L)	6.61	6.56			
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010			
	Sodium (Na)-Dissolved (mg/L)	6.30	9.33			
	Strontium (Sr)-Dissolved (mg/L)	0.440	0.457			
	Sulfur (S)-Dissolved (mg/L)	151	153			
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010			
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010			
	Titanium (Ti)-Dissolved (mg/L)	0.00059	0.00066			
	Uranium (U)-Dissolved (mg/L)	0.00166	0.00155			
	Vanadium (V)-Dissolved (mg/L)	<0.00050	0.00054			
	Zinc (Zn)-Dissolved (mg/L)	0.0063	0.0050			
	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)
Method Blank	Chromium (Cr)-Total	MB-LOR	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Aluminum (Al)-Dissolved	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Boron (B)-Dissolved	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Barium (Ba)-Total	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Boron (B)-Total	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Lithium (Li)-Total	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Sodium (Na)-Total	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Strontium (Sr)-Total	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Nitrate (as N)	MS-B	L1826266-1, -2, -3, -4, -5, -6, -7

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLIS	Detection Limit Adjusted: Insufficient Sample
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

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.

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

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

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

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

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

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

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

Reference Information

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.

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

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

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

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

HARDNESS-CALC-VA Water Hardness APHA 2340B

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

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

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

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

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

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 NH3-NITROGEN (AMMONIA)

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

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

Reference Information

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

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

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

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

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

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

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

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

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

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

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

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-VA Water Sulfate in Water by IC EPA 300.1 (mod)

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

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

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

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

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

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

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

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

Chain of Custody Numbers:

1 2

Reference Information

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg - milligrams per kilogram based on dry weight of sample.
mg/kg wwt - milligrams per kilogram based on wet weight of sample.
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L - milligrams per litre.
< - Less than.
D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

A

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L1826266-COFC

COC 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:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Lyndsay Doetzel	Quality Control (QC) Report with Report	☐ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	2195 - 2nd Avenue Whitehorse, YT Y1A 3T8	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
		Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	867-393-4882	Email 1 or Fax	ldoetzel@edynamics.com	Specify Date Required for E2, E or P:
		Email 2	Emilie.Hamm@gov.yk.ca	
		Email 3	erik.pit@gov.yk.ca	

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

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q55559	Approver ID:	Cost Center:
Job #:	MOUNT NANSEN 16-Y-0089	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): L1826266 | ALS Contact: Craig Flaherty | Sampler: DH, AMI

Analysis Request

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA,EC-PCT-VA,PH-PCT-VA	ANIONS-ALL-IC-WR,TSS-MAN-WR	CN-WAD-CFA-VA,CN-T-CFA-VA	CN-CNO-WT	CN-SCN-VA	NH3-F-VA	MET-T-BCMDG-VA	MET-D-BCMDG-VA	IONBALANC-VA, TDS-CALC-VA					Number of Containers
							P	P	P	P	P	F/P						
[redacted]	WQ - SEEP	07 -Sep-16	14:30	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ - TP	07 -Sep-16	15:50	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ - DC-DX	07 -Sep-16	18:30	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ - DC-DX+105	07 -Sep-16	17:55	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ - DC-D1b	07 -Sep-16	17:25	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ - DC-B	07 -Sep-16	14:55	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ - DC-U	07 -Sep-16	13:30	Water	R	R	R	R	R	R	R	R	R					9
[redacted]																		
[redacted]																		
[redacted]																		
[redacted]																		
[redacted]																		

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

SAMPLE CONDITION AS RECEIVED (lab use only) [redacted]

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

INITIAL COOLER TEMPERATURES °C: [redacted] | FINAL COOLER TEMPERATURES °C: [redacted]

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:
[redacted]	08 Sept. 2016	08:07	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

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

NA-FM 0029e v06 Front04 January 2014

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

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

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

Date Received: 08-SEP-16
Report Date: 23-SEP-16 17:02 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1826315

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

Comments: Not all analyses could be performed on the samples ALS identify as L1826315-3 and L1826315-4 since the specifically bottles required were not received.

Can Dang
Senior Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1826315-1	L1826315-2	L1826315-3	L1826315-4	L1826315-5
Description	water	water	water	water	water
Sampled Date	07-SEP-16	07-SEP-16	07-SEP-16		07-SEP-16
Sampled Time	12:00	16:40	08:40		15:50
Client ID	WQ-PC-D	WQ-CH-P-13-01	WQ-NW-SEEP-02	TRAVEL BLANK	WQ-VC-UMN(R)
Grouping / **Analyte**					
WATER					
Physical Tests Conductivity (uS/cm)	504	1530	487	<2.0	173
Hardness (as CaCO3) (mg/L)	246	1010	266		103
pH (pH)	7.51	6.72	7.65	5.68	7.92
Total Suspended Solids (mg/L)	222	<3.0	21.3	<3.0	3.8
TDS (Calculated) (mg/L)	333	1330	340	<1.0	130
Anions and Nutrients Alkalinity, Bicarbonate (as CaCO3) (mg/L)	53.4	10.1	46.5	<1.0	64.2
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)	53.4	10.1	46.5	<1.0	64.2
Ammonia, Total (as N) (mg/L)	2.03	0.0075	<0.0050	<0.0050	0.0052
Bromide (Br) (mg/L)	<0.050	<0.50 DLDS	<0.050	<0.050	
Chloride (Cl) (mg/L)	0.72	<5.0 DLDS	0.68	<0.50	<0.50
Fluoride (F) (mg/L)	0.079	<0.20 DLDS	0.363	<0.020	0.086
Nitrate (as N) (mg/L)	0.0799	0.095 HTD	0.0307 HTD	<0.0050	0.116
Nitrite (as N) (mg/L)	0.0052	<0.010 DLDS	<0.0010	<0.0010	<0.0010
Sulfate (SO4) (mg/L)	200	966	213	<0.30	51.9
Anion Sum (meq/L)	5.27	20.3	5.38	<0.10	2.38
Cation Sum (meq/L)	5.43	20.6	5.41	<0.10	2.20
Cation - Anion Balance (%)	1.5	0.7	0.3	0.0	-3.8
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
Cyanate (mg/L)	0.63	<0.20			<0.20
Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50 SP	<0.50	<0.50
Total Metals Aluminum (Al)-Total (mg/L)	9.49	0.198	0.156	<0.0030	0.0261
Antimony (Sb)-Total (mg/L)	0.00868	0.00011	0.00399	<0.00010	0.00018
Arsenic (As)-Total (mg/L)	0.128	0.00051	0.0169	<0.00010	0.00090
Barium (Ba)-Total (mg/L)	0.306	0.0124	0.00798	<0.000050	0.0595
Beryllium (Be)-Total (mg/L)	0.000435	0.000039	<0.000020	<0.000020	<0.000020
Bismuth (Bi)-Total (mg/L)	0.00103	<0.000050	0.000107	<0.000050	<0.000050
Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd)-Total (mg/L)	0.00179	0.0105	0.000481	<0.0000050	0.0000190
Calcium (Ca)-Total (mg/L)	71.9	241	81.9	<0.050	28.1
Chromium (Cr)-Total (mg/L)	0.00996	0.00016	0.00018	<0.00010	0.00028
Cobalt (Co)-Total (mg/L)	0.00600	<0.00010	<0.00010	<0.00010	0.00011
Copper (Cu)-Total (mg/L)	0.0310	0.00112	0.0231	<0.00050	0.00148
Iron (Fe)-Total (mg/L)	15.6	0.041	0.416	<0.010	0.247
Lead (Pb)-Total (mg/L)	0.0625	<0.000050	0.00574	<0.000050	<0.000050

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1826315-6	L1826315-7			
	Description	water	water			
	Sampled Date	07-SEP-16	07-SEP-16			
	Sampled Time	13:30	12:25			
	Client ID	WQ-DC-U-R	FIELD BLANK			
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	1030	<2.0			
	Hardness (as CaCO3) (mg/L)	618	<0.50			
	pH (pH)	8.10	5.29			
	Total Suspended Solids (mg/L)	119	<3.0			
	TDS (Calculated) (mg/L)	760	<1.0			
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	173	<1.0			
	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)	173	<1.0			
	Ammonia, Total (as N) (mg/L)	0.427	<0.0050			
	Bromide (Br) (mg/L)	<0.25 DLDS	<0.050			
	Chloride (Cl) (mg/L)	<2.5 DLDS	<0.50			
	Fluoride (F) (mg/L)	<0.10 DLDS	<0.020			
	Nitrate (as N) (mg/L)	0.224	<0.0050			
	Nitrite (as N) (mg/L)	<0.0050 DLDS	<0.0010			
	Sulfate (SO4) (mg/L)	433	<0.30			
	Anion Sum (meq/L)	12.5	<0.10			
	Cation Sum (meq/L)	12.9	<0.10			
	Cation - Anion Balance (%)	1.6	0.0			
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)	2.09	<0.0030			
	Antimony (Sb)-Total (mg/L)	0.00230	<0.00010			
	Arsenic (As)-Total (mg/L)	0.0276	<0.00010			
	Barium (Ba)-Total (mg/L)	0.0776	<0.000050			
	Beryllium (Be)-Total (mg/L)	0.000083	<0.000020			
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050			
	Boron (B)-Total (mg/L)	0.016	<0.010			
	Cadmium (Cd)-Total (mg/L)	0.000253	<0.0000050			
	Calcium (Ca)-Total (mg/L)	143	<0.050			
	Chromium (Cr)-Total (mg/L)	0.00388	<0.00010			
	Cobalt (Co)-Total (mg/L)	0.00186	<0.00010			
	Copper (Cu)-Total (mg/L)	0.00725	<0.00050			
	Iron (Fe)-Total (mg/L)	5.64	<0.010			
	Lead (Pb)-Total (mg/L)	0.00299	<0.000050			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1826315-1	L1826315-2	L1826315-3	L1826315-4	L1826315-5
Description	water	water	water	water	water
Sampled Date	07-SEP-16	07-SEP-16	07-SEP-16		07-SEP-16
Sampled Time	12:00	16:40	08:40		15:50
Client ID	WQ-PC-D	WQ-CH-P-13-01	WQ-NW-SEEP-02	TRAVEL BLANK	WQ-VC-UMN(R)
Grouping / **Analyte**					
WATER					
Total Metals Lithium (Li)-Total (mg/L)	0.0082	0.0015	0.0014	<0.0010	<0.0010
Magnesium (Mg)-Total (mg/L)	18.4	88.4	15.5	<0.10	8.81
Manganese (Mn)-Total (mg/L)	1.53	0.227	0.0168	<0.00010	0.0515
Mercury (Hg)-Total (mg/L)	0.000067	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Total (mg/L)	0.00107	<0.000050	0.000176	<0.000050	0.000424
Nickel (Ni)-Total (mg/L)	0.00806	0.00781	<0.00050	<0.00050	<0.00050
Phosphorus (P)-Total (mg/L)	0.283	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total (mg/L)	3.21	0.43	1.69	<0.10	0.66
Selenium (Se)-Total (mg/L)	0.000235	0.000074	0.000059	<0.000050	0.000064
Silicon (Si)-Total (mg/L)	24.3	9.17	3.05	<0.050	6.42
Silver (Ag)-Total (mg/L)	0.00141	<0.000010	0.000127	<0.000010	<0.000010
Sodium (Na)-Total (mg/L)	6.42	6.30	0.986	<0.050	2.90
Strontium (Sr)-Total (mg/L)	0.373	0.505	0.165	<0.00020	0.252
Sulfur (S)-Total (mg/L)	68.1	324	75.8	<0.50	11.4
Thallium (Tl)-Total (mg/L)	0.000165	<0.000010	0.000026	<0.000010	<0.000010
Tin (Sn)-Total (mg/L)	0.00018	<0.00010	0.00012	<0.00010	<0.00010
Titanium (Ti)-Total (mg/L)	0.240	0.00049	0.00196	<0.00030	<0.00030
Uranium (U)-Total (mg/L)	0.00126	<0.000010	0.000215	<0.000010	0.000479
Vanadium (V)-Total (mg/L)	0.0269	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Total (mg/L)	0.172	3.81	0.0329	<0.0030	<0.0030
Zirconium (Zr)-Total (mg/L)	0.00118	<0.00030	<0.00030	<0.00030	<0.00030
Dissolved Metals Dissolved Mercury Filtration Location	FIELD	FIELD	LAB		FIELD
Dissolved Metals Filtration Location	FIELD	FIELD	LAB		FIELD
Aluminum (Al)-Dissolved (mg/L)	0.0144	0.171	0.0095		0.0256
Antimony (Sb)-Dissolved (mg/L)	0.00351	0.00011	0.00287		0.00015
Arsenic (As)-Dissolved (mg/L)	0.0149	0.00043	0.00828		0.00091
Barium (Ba)-Dissolved (mg/L)	0.119	0.0116	0.00510		0.0608
Beryllium (Be)-Dissolved (mg/L)	<0.000020	0.000036	<0.000020		<0.000020
Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050		<0.000050
Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010		<0.010
Cadmium (Cd)-Dissolved (mg/L)	0.000127	0.0101	0.000348		0.0000179
Calcium (Ca)-Dissolved (mg/L)	71.2	250	80.3		26.9
Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010		0.00022
Cobalt (Co)-Dissolved (mg/L)	0.00095	<0.00010	<0.00010		0.00011
Copper (Cu)-Dissolved (mg/L)	0.00158	0.00084	0.0108		0.00144
Iron (Fe)-Dissolved (mg/L)	0.035	0.027	<0.010		0.065
Lead (Pb)-Dissolved (mg/L)	0.000193	<0.000050	<0.000050		<0.000050

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1826315-6	L1826315-7			
	Description	water	water			
	Sampled Date	07-SEP-16	07-SEP-16			
	Sampled Time	13:30	12:25			
	Client ID	WQ-DC-U-R	FIELD BLANK			
Grouping	**Analyte**					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	0.0035	<0.0010			
	Magnesium (Mg)-Total (mg/L)	57.0	<0.10			
	Manganese (Mn)-Total (mg/L)	0.889	<0.00010			
	Mercury (Hg)-Total (mg/L)	<0.000025 DLM	<0.0000050			
	Molybdenum (Mo)-Total (mg/L)	0.000449	<0.000050			
	Nickel (Ni)-Total (mg/L)	0.00330	<0.00050			
	Phosphorus (P)-Total (mg/L)	0.078	<0.050			
	Potassium (K)-Total (mg/L)	3.25	<0.10			
	Selenium (Se)-Total (mg/L)	0.000209	<0.000050			
	Silicon (Si)-Total (mg/L)	9.51	<0.050			
	Silver (Ag)-Total (mg/L)	0.000083	<0.000010			
	Sodium (Na)-Total (mg/L)	8.81	<0.050			
	Strontium (Sr)-Total (mg/L)	0.445	<0.00020			
	Sulfur (S)-Total (mg/L)	147	<0.50			
	Thallium (Tl)-Total (mg/L)	0.000037	<0.000010			
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010			
	Titanium (Ti)-Total (mg/L)	0.0953	<0.00030			
	Uranium (U)-Total (mg/L)	0.00188	<0.000010			
	Vanadium (V)-Total (mg/L)	0.00928	<0.00050			
	Zinc (Zn)-Total (mg/L)	0.0326	<0.0030			
	Zirconium (Zr)-Total (mg/L)	0.00042	<0.00030			
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD			
	Dissolved Metals Filtration Location	FIELD	FIELD			
	Aluminum (Al)-Dissolved (mg/L)	0.0431	<0.0010			
	Antimony (Sb)-Dissolved (mg/L)	0.00154	<0.00010			
	Arsenic (As)-Dissolved (mg/L)	0.00931	<0.00010			
	Barium (Ba)-Dissolved (mg/L)	0.0502	<0.000050			
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020			
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050			
	Boron (B)-Dissolved (mg/L)	0.015	<0.010			
	Cadmium (Cd)-Dissolved (mg/L)	0.0000105	<0.0000050			
	Calcium (Ca)-Dissolved (mg/L)	147	<0.050			
	Chromium (Cr)-Dissolved (mg/L)	0.00016	<0.00010			
	Cobalt (Co)-Dissolved (mg/L)	0.00088	<0.00010			
	Copper (Cu)-Dissolved (mg/L)	0.00105	<0.00020			
	Iron (Fe)-Dissolved (mg/L)	0.491	<0.010			
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1826315-1 water 07-SEP-16 12:00 WQ-PC-D	L1826315-2 water 07-SEP-16 16:40 WQ-CH-P-13-01	L1826315-3 water 07-SEP-16 08:40 WQ-NW-SEEP-02	L1826315-4 water TRAVEL BLANK	L1826315-5 water 07-SEP-16 15:50 WQ-VC-UMN(R)
WATER						
Dissolved Metals	Lithium (Li)-Dissolved (mg/L)	0.0022	0.0016	0.0017		<0.0010
	Magnesium (Mg)-Dissolved (mg/L)	16.7	93.8	15.9		8.63
	Manganese (Mn)-Dissolved (mg/L)	1.31	0.203	0.00027		0.0523
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050	<0.0000050		<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.000711	<0.000050	<0.00025 RRR		0.000394
	Nickel (Ni)-Dissolved (mg/L)	0.00084	0.00760	<0.00050		<0.00050
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050		<0.050
	Potassium (K)-Dissolved (mg/L)	1.68	0.45	1.76		0.66
	Selenium (Se)-Dissolved (mg/L)	0.000089	<0.000050	<0.000050		0.000056
	Silicon (Si)-Dissolved (mg/L)	5.90	9.46	2.79		6.24
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010		<0.000010
	Sodium (Na)-Dissolved (mg/L)	6.15	6.02	1.09		2.84
	Strontium (Sr)-Dissolved (mg/L)	0.343	0.548	0.167		0.252
	Sulfur (S)-Dissolved (mg/L)	70.5	323	70.4		11.0
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	0.000012		<0.000010
	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)	0.000555	0.000010	0.000192		0.000464
	Vanadium (V)-Dissolved (mg/L)	0.00063	<0.00050	<0.00050		<0.00050
	Zinc (Zn)-Dissolved (mg/L)	0.0117	3.75	0.0136		0.0016
	Zirconium (Zr)-Dissolved (mg/L)	<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	L1826315-6	L1826315-7			
	Description	water	water			
	Sampled Date	07-SEP-16	07-SEP-16			
	Sampled Time	13:30	12:25			
	Client ID	WQ-DC-U-R	FIELD BLANK			
Grouping	**Analyte**					
WATER						
Dissolved Metals	Lithium (Li)-Dissolved (mg/L)	0.0023	<0.0010			
	Magnesium (Mg)-Dissolved (mg/L)	60.7	<0.10			
	Manganese (Mn)-Dissolved (mg/L)	0.839	<0.00010			
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050			
	Molybdenum (Mo)-Dissolved (mg/L)	0.000323	<0.000050			
	Nickel (Ni)-Dissolved (mg/L)	0.00090	<0.00050			
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050			
	Potassium (K)-Dissolved (mg/L)	2.91	<0.10			
	Selenium (Se)-Dissolved (mg/L)	0.000087	<0.000050			
	Silicon (Si)-Dissolved (mg/L)	6.47	<0.050			
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010			
	Sodium (Na)-Dissolved (mg/L)	9.02	<0.050			
	Strontium (Sr)-Dissolved (mg/L)	0.437	<0.00020			
	Sulfur (S)-Dissolved (mg/L)	149	<0.50			
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010			
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010			
	Titanium (Ti)-Dissolved (mg/L)	0.00052	<0.00030			
	Uranium (U)-Dissolved (mg/L)	0.00162	<0.000010			
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050			
	Zinc (Zn)-Dissolved (mg/L)	0.0044	<0.0010			
	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

Qualifiers for Individual Samples Listed:

Sample Number	Client Sample ID	Qualifier	Description
L1826315-3	WQ-NW-SEEP-02	WSMT	Water sample(s) for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.
		WSMD	Water sample(s) for dissolved mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Chromium (Cr)-Total	MB-LOR	L1826315-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Aluminum (Al)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1826315-3
Matrix Spike	Boron (B)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1826315-3
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1826315-1, -2, -5, -6, -7
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1826315-3
Matrix Spike	Barium (Ba)-Total	MS-B	L1826315-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Boron (B)-Total	MS-B	L1826315-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Lithium (Li)-Total	MS-B	L1826315-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Sodium (Na)-Total	MS-B	L1826315-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Strontium (Sr)-Total	MS-B	L1826315-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Nitrate (as N)	MS-B	L1826315-1, -4, -6, -7

Qualifiers for Individual Parameters Listed:

Qualifier	Description
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).
HTD	Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRR	Refer to Report Remarks for issues regarding this analysis
SP	Sample was Preserved at the laboratory

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.

ALS Test Code	Matrix	Test Description	Method Reference**
BE-D-L-CCMS-VA	Water	Diss. Be (low) in Water by CRC ICPMS	APHA 3030B/6020A (mod)

Reference Information

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

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

BE-T-L-CCMS-VA Water Total Be (Low) in Water by CRC ICPMS EPA 200.2/6020A (mod)

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

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

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

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

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

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

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.

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

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

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

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

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 CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

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

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

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

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

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]

Reference Information

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 NH3-NITROGEN (AMMONIA)

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

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

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

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

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

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

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

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"

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.

Reference Information

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-VA	Water	Sulfate in Water by IC	EPA 300.1 (mod)

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

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".
The Total Dissolved Solids result is calculated from measured concentrations of anions and cations in the sample.

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

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

** 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

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.

C

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L1826315-COFC

COC Number: 14 -

Page ___ of ___

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

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

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q55559	Approver ID:	Cost Center:
Job #:	MOUNT NANSEN 16-Y-0089	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): L1826315

ALS Contact: Craig Flaherty

Sampler: DH, AM

Analysis Request

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA,EC-PCT-VA,PH-PCT-VA	ANIONS-ALL-IC-WR,TSS-MAN-WR	CN-WAD-CFA-VA,CN-T-CFA -VA	CN-CNO-WT	CN-SCN-VA	NH3-F-VA	MET-T-BCMDG-VA	MET-D-BCMDG-VA	IONBALANC-VA, TDS-CALC-VA					Number of Containers
							P	P	P	P	P	F/P						
[redacted]	WQ-PC-D	07-Sep-16	12:00	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-CH-P-13-01	07-Sep-16	16:40	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-NW-SEEP-02	08-Sep-16	08:40	Water	R	R	R	R	R	R	R	R	R					2
[redacted]	TRAVEL BLANK	-Sep-16		Water	R	R	R	R	R	R	R	R	R					7
[redacted]	WQ-VC-UMN(r)	06-Sep-16	15:50	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-DC-U-r	07-Sep-16	13:30	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	FIELD BLANK	07-Sep-16	12:25	Water	R	R	R	R	R	R	R	R	R					9
[redacted]																		
[redacted]																		
[redacted]																		
[redacted]																		
[redacted]																		

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

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | Ice packs ☐ Yes ☐ No | Cooling Initiated ☐

SIF Observations ☐ Yes ☐ No | Custody seal intact ☐ Yes ☐ No

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
[redacted]			[redacted]		

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:
[redacted]	08 Sept. 2016	08:50	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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.

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

Date Received: 08-SEP-16
Report Date: 22-SEP-16 17:21 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1826331

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1826331-1 Water 06-SEP-16 17:00 WQ-DC-R	L1826331-2 Water 07-SEP-16 09:35 WQ-VC-U	L1826331-3 Water 06-SEP-16 15:00 WQ-VC-R	L1826331-4 Water 07-SEP-16 09:10 WQ-VC-DBC	L1826331-5 Water 06-SEP-16 15:35 WQ-VC-UMN
WATER						
Physical Tests	Conductivity (uS/cm)	898	162	188	175	208
	Hardness (as CaCO3) (mg/L)	507	79.8	89.5	85.5	101
	pH (pH)	7.93	7.91	7.95	7.91	7.99
	Total Suspended Solids (mg/L)	3.1	<3.0	3.2	22.2	5.1
	TDS (Calculated) (mg/L)	639	88.7	105	97.0	118
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	157	73.7	71.1	74.9	78.8
	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)	157	73.7	71.1	74.9	78.8
	Ammonia, Total (as N) (mg/L)	0.0705	<0.0050	0.0055	0.0169	<0.0050
	Bromide (Br) (mg/L)		<0.050		<0.050	
	Chloride (Cl) (mg/L)	0.57	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.096	0.051	0.059	0.052	0.057
	Nitrate (as N) (mg/L)	0.537	0.0678	0.0600	0.0697	0.0707
	Nitrite (as N) (mg/L)	0.0065	<0.0010	<0.0010	<0.0010	<0.0010
	Sulfate (SO4) (mg/L)	358	13.6	28.1	19.0	32.3
	Anion Sum (meq/L)	10.6	1.76	2.01	1.90	2.25
	Cation Sum (meq/L)	10.7	1.72	1.93	1.84	2.15
	Cation - Anion Balance (%)	0.2	-1.3	-2.2	-1.7	-2.3
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	<0.20	<0.20
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
Total Metals	Aluminum (Al)-Total (mg/L)	0.0383	0.0453	0.118	0.444	0.142
	Antimony (Sb)-Total (mg/L)	0.00118	<0.00010	0.00020	0.00028	0.00021
	Arsenic (As)-Total (mg/L)	0.0136	0.00037	0.00148	0.00278	0.00165
	Barium (Ba)-Total (mg/L)	0.0441	0.0596	0.0586	0.0686	0.0612
	Beryllium (Be)-Total (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Total (mg/L)	0.016	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.0000379	0.0000212	0.0000309	0.0000562	0.0000333
	Calcium (Ca)-Total (mg/L)	133	21.3	25.1	23.4	29.2
	Chromium (Cr)-Total (mg/L)	0.00029	0.00015	0.00028	0.00063	0.00033
	Cobalt (Co)-Total (mg/L)	0.00086	<0.00010	0.00018	0.00033	0.00018
	Copper (Cu)-Total (mg/L)	0.00131	0.00148	0.00210	0.00227	0.00177
	Iron (Fe)-Total (mg/L)	1.35	0.120	0.325	0.707	0.253
	Lead (Pb)-Total (mg/L)	0.000143	<0.000050	0.000393	0.00144	0.000424

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1826331-6	L1826331-7			
	Description	Water	Water			
	Sampled Date	07-SEP-16	07-SEP-16			
	Sampled Time	10:35	12:25			
	Client ID	WQ-BC	WQ-PC-U			
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	300	494			
	Hardness (as CaCO3) (mg/L)	151	232			
	pH (pH)	7.88	7.38			
	Total Suspended Solids (mg/L)	676	352			
	TDS (Calculated) (mg/L)	186	326			
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	83.8	51.9			
	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)	83.8	51.9			
	Ammonia, Total (as N) (mg/L)	0.190	2.08			
	Bromide (Br) (mg/L)	<0.050	<0.050			
	Chloride (Cl) (mg/L)	<0.50	0.71			
	Fluoride (F) (mg/L)	0.076	0.075			
	Nitrate (as N) (mg/L)	0.139	0.0663			
	Nitrite (as N) (mg/L)	0.0029	0.0051			
	Sulfate (SO4) (mg/L)	75.6	200			
	Anion Sum (meq/L)	3.26	5.23			
	Cation Sum (meq/L)	3.25	5.14			
	Cation - Anion Balance (%)	-0.1	-0.8			
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)	12.8	11.2			
	Antimony (Sb)-Total (mg/L)	0.00271	0.00928			
	Arsenic (As)-Total (mg/L)	0.0668	0.173			
	Barium (Ba)-Total (mg/L)	0.282	0.375			
	Beryllium (Be)-Total (mg/L)	0.000472	0.000500			
	Bismuth (Bi)-Total (mg/L)	0.000801	0.00141			
	Boron (B)-Total (mg/L)	<0.010	<0.010			
	Cadmium (Cd)-Total (mg/L)	0.00188	0.00184			
	Calcium (Ca)-Total (mg/L)	52.7	77.0			
	Chromium (Cr)-Total (mg/L)	0.0178	0.0134			
	Cobalt (Co)-Total (mg/L)	0.00912	0.00779			
	Copper (Cu)-Total (mg/L)	0.0314	0.0383			
	Iron (Fe)-Total (mg/L)	22.9	21.3			
	Lead (Pb)-Total (mg/L)	0.0584	0.0738			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1826331-1	L1826331-2	L1826331-3	L1826331-4	L1826331-5
Description	Water	Water	Water	Water	Water
Sampled Date	06-SEP-16	07-SEP-16	06-SEP-16	07-SEP-16	06-SEP-16
Sampled Time	17:00	09:35	15:00	09:10	15:35
Client ID	WQ-DC-R	WQ-VC-U	WQ-VC-R	WQ-VC-DBC	WQ-VC-UMN
Grouping / **Analyte**					
WATER					
Total Metals Lithium (Li)-Total (mg/L)	0.0020	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium (Mg)-Total (mg/L)	48.4	6.97	8.17	7.44	8.78
Manganese (Mn)-Total (mg/L)	0.494	0.0276	0.0566	0.0710	0.0638
Mercury (Hg)-Total (mg/L)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Total (mg/L)	0.000333	0.000341	0.000383	0.000398	0.000418
Nickel (Ni)-Total (mg/L)	0.00106	<0.00050	0.00076	0.00080	0.00059
Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total (mg/L)	2.85	0.55	0.72	0.69	0.68
Selenium (Se)-Total (mg/L)	0.000067	<0.000050	0.000052	0.000050	<0.000050
Silicon (Si)-Total (mg/L)	6.66	6.52	6.92	7.28	6.50
Silver (Ag)-Total (mg/L)	<0.000010	<0.000010	<0.000010	0.000027	<0.000010
Sodium (Na)-Total (mg/L)	10.1	2.30	2.60	2.44	2.90
Strontium (Sr)-Total (mg/L)	0.414	0.239	0.228	0.239	0.261
Sulfur (S)-Total (mg/L)	123	4.77	9.52	6.71	11.3
Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total (mg/L)	0.00136	0.00068	0.00339	0.0155	0.00437
Uranium (U)-Total (mg/L)	0.00134	0.000383	0.000462	0.000483	0.000490
Vanadium (V)-Total (mg/L)	0.00054	<0.00050	0.00057	0.00147	0.00079
Zinc (Zn)-Total (mg/L)	0.0054	<0.0030	<0.0030	0.0059	0.0047
Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Dissolved Metals Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved (mg/L)	0.0173	0.0294	0.0352	0.0280	0.0256
Antimony (Sb)-Dissolved (mg/L)	0.00113	<0.00010	0.00016	0.00014	0.00017
Arsenic (As)-Dissolved (mg/L)	0.00787	0.00038	0.00094	0.00072	0.00092
Barium (Ba)-Dissolved (mg/L)	0.0458	0.0642	0.0586	0.0601	0.0603
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)	0.014	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd)-Dissolved (mg/L)	0.0000286	0.0000175	0.0000202	0.0000240	0.0000209
Calcium (Ca)-Dissolved (mg/L)	122	20.8	23.7	22.6	26.5
Chromium (Cr)-Dissolved (mg/L)	0.00025	0.00013	0.00017	0.00013	<0.00010
Cobalt (Co)-Dissolved (mg/L)	0.00085	<0.00010	0.00013	0.00010	0.00010
Copper (Cu)-Dissolved (mg/L)	0.00121	0.00144	0.00153	0.00146	0.00137
Iron (Fe)-Dissolved (mg/L)	0.419	0.066	0.110	0.067	0.060
Lead (Pb)-Dissolved (mg/L)	0.000051	<0.000050	<0.000050	<0.000050	<0.000050

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1826331-6	L1826331-7			
	Description	Water	Water			
	Sampled Date	07-SEP-16	07-SEP-16			
	Sampled Time	10:35	12:25			
	Client ID	WQ-BC	WQ-PC-U			
Grouping	**Analyte**					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	0.0100	0.0089			
	Magnesium (Mg)-Total (mg/L)	16.2	20.1			
	Manganese (Mn)-Total (mg/L)	1.07	1.71			
	Mercury (Hg)-Total (mg/L)	0.000065	0.000076			
	Molybdenum (Mo)-Total (mg/L)	0.00156	0.00117			
	Nickel (Ni)-Total (mg/L)	0.0125	0.0103			
	Phosphorus (P)-Total (mg/L)	0.569	0.365			
	Potassium (K)-Total (mg/L)	3.28	3.24			
	Selenium (Se)-Total (mg/L)	0.000269	0.000257			
	Silicon (Si)-Total (mg/L)	30.4	27.6			
	Silver (Ag)-Total (mg/L)	0.00115	0.00203			
	Sodium (Na)-Total (mg/L)	4.61	6.78			
	Strontium (Sr)-Total (mg/L)	0.321	0.380			
	Sulfur (S)-Total (mg/L)	27.1	70.4			
	Thallium (Tl)-Total (mg/L)	0.000240	0.000187			
	Tin (Sn)-Total (mg/L)	0.00021	0.00015			
	Titanium (Ti)-Total (mg/L)	0.495	0.273			
	Uranium (U)-Total (mg/L)	0.00341	0.00139			
	Vanadium (V)-Total (mg/L)	0.0416	0.0339			
	Zinc (Zn)-Total (mg/L)	0.141	0.201			
	Zirconium (Zr)-Total (mg/L)	0.00092	0.00052			
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD			
	Dissolved Metals Filtration Location	FIELD	FIELD			
	Aluminum (Al)-Dissolved (mg/L)	0.0324	0.0128			
	Antimony (Sb)-Dissolved (mg/L)	0.00063	0.00352			
	Arsenic (As)-Dissolved (mg/L)	0.00404	0.0144			
	Barium (Ba)-Dissolved (mg/L)	0.0625	0.120			
	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)	0.0000805	0.0000767			
	Calcium (Ca)-Dissolved (mg/L)	43.2	67.1			
	Chromium (Cr)-Dissolved (mg/L)	0.00031	0.00011			
	Cobalt (Co)-Dissolved (mg/L)	0.00030	0.00109			
	Copper (Cu)-Dissolved (mg/L)	0.00207	0.00110			
	Iron (Fe)-Dissolved (mg/L)	0.101	0.046			
	Lead (Pb)-Dissolved (mg/L)	0.000393	0.000219			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1826331-1	L1826331-2	L1826331-3	L1826331-4	L1826331-5
Description	Water	Water	Water	Water	Water
Sampled Date	06-SEP-16	07-SEP-16	06-SEP-16	07-SEP-16	06-SEP-16
Sampled Time	17:00	09:35	15:00	09:10	15:35
Client ID	WQ-DC-R	WQ-VC-U	WQ-VC-R	WQ-VC-DBC	WQ-VC-UMN
Grouping / **Analyte**					
WATER					
Dissolved Metals Lithium (Li)-Dissolved (mg/L)	0.0021	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium (Mg)-Dissolved (mg/L)	49.1	6.75	7.35	7.05	8.38
Manganese (Mn)-Dissolved (mg/L)	0.523	0.0258	0.0513	0.0613	0.0537
Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Dissolved (mg/L)	0.000299	0.000317	0.000345	0.000375	0.000377
Nickel (Ni)-Dissolved (mg/L)	0.00106	<0.00050	0.00065	<0.00050	<0.00050
Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved (mg/L)	2.50	0.53	0.59	0.58	0.62
Selenium (Se)-Dissolved (mg/L)	0.000098	<0.000050	0.000059	0.000063	<0.000050
Silicon (Si)-Dissolved (mg/L)	6.10	6.22	6.20	6.21	5.99
Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)-Dissolved (mg/L)	10.1	2.35	2.52	2.36	2.65
Strontium (Sr)-Dissolved (mg/L)	0.405	0.233	0.222	0.238	0.246
Sulfur (S)-Dissolved (mg/L)	128	4.86	9.83	7.20	11.4
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)	0.00058	<0.00030	0.00036	<0.00030	<0.00030
Uranium (U)-Dissolved (mg/L)	0.00124	0.000342	0.000405	0.000426	0.000467
Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved (mg/L)	0.0100	0.0012	0.0024	0.0018	0.0017
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	L1826331-6	L1826331-7			
	Description	Water	Water			
	Sampled Date	07-SEP-16	07-SEP-16			
	Sampled Time	10:35	12:25			
	Client ID	WQ-BC	WQ-PC-U			
Grouping	**Analyte**					
WATER						
Dissolved Metals	Lithium (Li)-Dissolved (mg/L)	0.0012	0.0025			
	Magnesium (Mg)-Dissolved (mg/L)	10.6	15.8			
	Manganese (Mn)-Dissolved (mg/L)	0.382	1.29			
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050			
	Molybdenum (Mo)-Dissolved (mg/L)	0.00104	0.000861			
	Nickel (Ni)-Dissolved (mg/L)	0.00071	0.00086			
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050			
	Potassium (K)-Dissolved (mg/L)	1.06	1.49			
	Selenium (Se)-Dissolved (mg/L)	0.000064	0.000114			
	Silicon (Si)-Dissolved (mg/L)	7.19	5.62			
	Silver (Ag)-Dissolved (mg/L)	0.000013	0.000029			
	Sodium (Na)-Dissolved (mg/L)	3.84	6.00			
	Strontium (Sr)-Dissolved (mg/L)	0.276	0.392			
	Sulfur (S)-Dissolved (mg/L)	27.1	70.2			
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010			
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010			
	Titanium (Ti)-Dissolved (mg/L)	0.00105	0.00058			
	Uranium (U)-Dissolved (mg/L)	0.00140	0.000576			
	Vanadium (V)-Dissolved (mg/L)	0.00089	0.00055			
	Zinc (Zn)-Dissolved (mg/L)	0.0016	0.0102			
	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)
Matrix Spike	Aluminum (Al)-Dissolved	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Boron (B)-Dissolved	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Sodium (Na)-Total	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Strontium (Sr)-Total	MS-B	L1826331-1, -2, -3, -4, -5, -6, -7
Matrix Spike	Nitrate (as N)	MS-B	L1826331-2, -4, -6, -7

Qualifiers for Individual Parameters Listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TITR-VA	Water	Alkalinity Species by Titration	APHA 2320 Alkalinity

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

BE-D-L-CCMS-VA	Water	Diss. Be (low) in Water by CRC ICPMS	APHA 3030B/6020A (mod)

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

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

BE-T-L-CCMS-VA	Water	Total Be (Low) in Water by CRC ICPMS	EPA 200.2/6020A (mod)

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

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

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

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

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

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

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

Reference Information

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.

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

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

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

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

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 CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

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

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

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

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

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 NH3-NITROGEN (AMMONIA)

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

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

Reference Information

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

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

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

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

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

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"

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-VA Water Sulfate in Water by IC EPA 300.1 (mod)

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

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".
The Total Dissolved Solids result is calculated from measured concentrations of anions and cations in the sample.

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

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

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

Reference Information

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

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.

B

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1826331-COFC

COC Number: 14 -

Page ___ of ___

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

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report	☐ Yes ☐ No
☐ Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	ldoetzel@edynamics.com
Email 2	Emilie.Hamm@gov.yk.ca
Email 3	erik.pit@gov.yk.ca

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

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

Specify Date Required for E2,E or P:

Invoice To	
Same as Report To	☑ Yes ☑ No
Copy of Invoice with Report	☑ Yes ☐ No
Company:	EDI
Contact:	S Jenner

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	sjenner@edynamics.com
Email 2	ldoetzel@edynamics.com

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

Oil and Gas Required Fields (client use)	
Approver ID:	Cost Center:
GL Account:	Routing Code:
Activity Code:	
Location:	

ALS Lab Work Order # (lab use only): L1826331

ALS Contact: Craig Flaherty

Sampler: DH, AM.

Analysis Request

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA,EC-PCT-VA,PH-PCT-VA	ANIONS-ALL-IC-WR,TSS-MAN-WR	CN-WAD-CFA-VA,CN-T-CFA-VA (P)	CN-CNO-WT (P)	CN-SCN-VA (P)	NH3-F-VA (P)	MET-T-BCMDG-VA (P)	MET-D-BCMDG-VA (F/P)	IONBALANC-VA, TDS-CALC-VA					Number of Containers
[redacted]	WQ-DC-R	06-Sep-16	17:00	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-VC-U	07-Sep-16	09:35	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-VC-R	06-Sep-16	15:00	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-VC-DBC	07-Sep-16	09:10	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-VC-OMN	06-Sep-16	15:35	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-BC	07-Sep-16	10:35	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-PC-U	07-Sep-16	12:25	Water	R	R	R	R	R	R	R	R	R					9

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System?
☐ Yes ☑ No

Are samples for human drinking water use?
☐ Yes ☑ No

Special Instructions / Specify Criteria to add on report (client Use)

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C | FINAL COOLER TEMPERATURES °C: 2, 1, 1

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: [signature]	Date: 08 Sept. 2016	Time: 08:10	Received by: [redacted]	Date: [redacted]	Time: [redacted]	Received by: JC	Date: SEP - 9 2016	Time: 8:20

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

NA-FM-0326e v09 Front/04 January 2014

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

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

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

Date Received: 08-SEP-16
Report Date: 20-SEP-16 16:25 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1826293

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1826293-1				
	Description	Water				
	Sampled Date	07-SEP-16				
	Sampled Time	11:30				
	Client ID	WQ-PW				
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0				
	Conductivity (uS/cm)	363				
	Hardness (as CaCO3) (mg/L)	187 HTC				
	pH (pH)	7.99				
	Total Dissolved Solids (mg/L)	219				
	Turbidity (NTU)	0.24				
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	164				
	Chloride (Cl) (mg/L)	<0.50				
	Fluoride (F) (mg/L)	0.100				
	Nitrate (as N) (mg/L)	0.126				
	Nitrite (as N) (mg/L)	<0.0010				
	Sulfate (SO4) (mg/L)	32.1				
Total Metals	Aluminum (Al)-Total (mg/L)	<0.010				
	Antimony (Sb)-Total (mg/L)	<0.00050				
	Arsenic (As)-Total (mg/L)	0.00039				
	Barium (Ba)-Total (mg/L)	0.084				
	Boron (B)-Total (mg/L)	<0.10				
	Cadmium (Cd)-Total (mg/L)	<0.00020				
	Calcium (Ca)-Total (mg/L)	41.6				
	Chromium (Cr)-Total (mg/L)	<0.0020				
	Copper (Cu)-Total (mg/L)	<0.0010				
	Iron (Fe)-Total (mg/L)	<0.030				
	Lead (Pb)-Total (mg/L)	0.00062				
	Magnesium (Mg)-Total (mg/L)	20.2				
	Manganese (Mn)-Total (mg/L)	<0.0020				
	Mercury (Hg)-Total (mg/L)	<0.00020				
	Potassium (K)-Total (mg/L)	0.90				
	Selenium (Se)-Total (mg/L)	<0.0010				
	Sodium (Na)-Total (mg/L)	4.8				
	Uranium (U)-Total (mg/L)	0.00177				
	Zinc (Zn)-Total (mg/L)	<0.050				

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Copper (Cu)-Total	MB-LOR	L1826293-1
Matrix Spike	Barium (Ba)-Total	MS-B	L1826293-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L1826293-1
Matrix Spike	Copper (Cu)-Total	MS-B	L1826293-1
Matrix Spike	Magnesium (Mg)-Total	MS-B	L1826293-1
Matrix Spike	Sodium (Na)-Total	MS-B	L1826293-1
Matrix Spike	Nitrate (as N)	MS-B	L1826293-1

Qualifiers for Individual Parameters Listed:

Qualifier	Description
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

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

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

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

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

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

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

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

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

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

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

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

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

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

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

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.

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

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

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

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

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

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

Reference Information

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

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

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

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

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

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

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

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

TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"

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

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

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

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

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

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

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.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1826293-COFC

COC 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:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Lyndsay Doetzel	Quality Control (QC) Report with Report	☐ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	2195 - 2nd Avenue Whitehorse, YT Y1A 3T8	☐ Criteria on Report - provide details below if box checked Select Distribution:	☐ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	867-393-4882	Email 1 or Fax	ldoetzel@edynamics.com	Specify Date Required for E2,E or P:
		Email 2	Emilie.Hamm@gov.yk.ca	
		Email 3	erik.plt@gov.yk.ca	

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

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q55556	Approver ID:	Cost Center:
Job #:	MOUNT NANSEN 16-Y-0089	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): L1826293

ALS Contact: Craig Flaherty

Sampler: DH, AM

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	FULL-TOT-DW-WR	Number of Containers
[redacted]	WQ-PW	07-Sep-16	11:30	Water	R	3

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ Yes ☐ No

Are samples for human drinking water use? ☑ Yes ☐ No

Special Instructions / Specify Criteria to add on report (client Use)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ | SIF Observations ☐ Yes ☐ No

Ice packs ☑ Yes ☐ No | Custody seal intact ☐ Yes ☐ No

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
20.2	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date: 08 Sept. 2016	Time: 12:30	Received by:	Date:	Time:	Received by:	Date: SEP 9 2016	Time:

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

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

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

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

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

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

#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 Deetzel
Phone / *Téléphone*: 867-393-4682
Mailing address / *Adresse postale*: 2195 Second Ave.
Whitehorse, Yukon
Fax / *Télécopieur*: 867-393-4883
Postal code / *Code postal*: Y1A 3T8
First Nation, Municipal or Business Name / *Nom de la Première nation, de la municipalité ou de l'entreprise*: EDI
Agent / *Agent*:
Fax / *Télécopieur*:

Sampling Location · *Lieu de la prise d'échantillon*

Municipal Address / *Adresse municipale*: MH. Nansen Pumphouse
Subdivision / *Lotissement*:
Legal Description Lot / *Désignation officielle Lot*:
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)*:

Sample Collection / *Prélèvement de l'échantillon*

Sample Collected By / *Echantillon prélevé par*: Alex Miseliac
Date / *Date*: ~~08~~ 16/09/08 (YY/MM/DD · *AA/MM/JJ*)
Time / *Heure*: 09:01 (am / *pm*)
Sampling Site (e.g., kitchen tap) / *Point d'échantillonnage (ex. : robinet de cuisine)*: Pumphouse
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*: Sept 8/16 (YY/MM/DD · *AA/MM/JJ*) Time / *Heure*: 12:46 (am / *pm*) By / *Par*: Temp 4°

Condition of Sample / ***État de l'échantillon***: ☐ Satisfactory / *Satisfaisant* ☐ Unsatisfactory / *Non satisfaisant* Details / *Précisez*:

Incubation / ***Incubation***: Date / *Date*: (YY/MM/DD · *AA/MM/JJ*) Time / *Heure*: (am / *pm*) By / *Par*: Incubator / *Incubateur*:

Analysis Completed / ***Analyse terminée***: Date / *Date*: (YY/MM/DD · *AA/MM/JJ*) 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*: ☐ Present / *Présence* ☐ Absent / *Absence*

E. coli/*E. coli*: ☐ Present / *Présence* ☐ Absent / *Absence*

Comments / *Commentaires*

Report Authorized By / *Rapport autorisé par*:
Position / *Poste*:
Date / *Date*: (YY/MM/DD · *AA/MM/JJ*)

Distribution: / *Distribution :* White - Chain of Custody / *Blanc - Chaîne de possession* · Yellow - Lab Copy / *Jaune - Laboratoire* · Pink - Client Copy / *Rose - Client*

YG(4649)NC3 Rev.03/2013

Sample Number / ***Numéro de l'échantillon***: 67313

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Agent / *Agent*:
Fax / *Télécopieur*:

Sampling Location · *Lieu de la prise d'échantillon*

Municipal Address / *Adresse municipale*: Mt. Nansen Pumphouse
Subdivision / *Lotissement*:
Legal Description Lot / *Désignation officielle Lot*:
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)*:

Sample Collection / *Prélèvement de l'échantillon*

Sample Collected By / *Échantillon prélevé par*: Alex Mischler
Date / *Date* (YY/MM/DD · AA/MM/JJ): ~~08/0~~ 16/09/08
Time / *Heure*: 09:01 (am / pm)
Sampling Site (e.g., kitchen tap) / *Point d'échantillonnage (ex. : robinet de cuisine)*: Pumphouse
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*

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☐ 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* (YY/MM/DD · AA/MM/JJ): Sept 8/16
Time / *Heure*: 12:40 (am / pm)
By / *Par*: Temp 40

Condition of Sample / ***État de l'échantillon***
☑ Satisfactory / *Satisfaisant* ☐ Unsatisfactory / *Non satisfaisant*
Details / *Précisez*:

Incubation / ***Incubation***
Date / *Date* (YY/MM/DD · AA/MM/JJ): 16/09/08
Time / *Heure*: 4:00 (am / pm)
By / *Par*: R
Incubator / *Incubateur*: 4

Analysis Completed / ***Analyse terminée***
Date / *Date* (YY/MM/DD · AA/MM/JJ): 160909
Time / *Heure*: 4:a (am / pm)
By / *Par*: S

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

Total Coliforms/*Coliformes totaux*	**E. coli**/*E. coli*
☐ Present / *Présence* ☑ Absent / *Absence*	☐ Present / *Présence* ☑ Absent / *Absence*

Comments / *Commentaires*