ENVIRONMENTAL DYNAMICS INC.

2195 – 2nd Avenue
Whitehorse, YT Y1A 3T8
P: (867) 393-4882 ⌋F: (867) 393-4883

January 12, 2017

EDI Project No: 16Y0089

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

Attention: Emilie Hamm, A/Project Manager

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

Standard November sampling trip:

Trip dates:	November 7-9, 2016
EDI field staff:	Joel MacFabe, Gabriel Rivest and Danny Skookum
Weather during trip:	Air temperatures ranged from -5 to 1°C, with partly cloudy to clear skies.

Additional November sampling trips:

Trips dates:	November 17, 2016 and November 28-29, 2016
EDI field staff:	Gabriel Rivest and Danny Skookum
Weather during trip:	On November 17, air temperature was approximately -18°C and skies were partly cloudy. On November 28, air temperature at the time of sampling was approximately -13°C, and skies were overcast.

This monthly report provides a summary of site conditions and data collected during EDI's November 2016 trips to Mount Nansen as part of the 2016/17 Water Resources Investigation. This report describes site conditions, meteorology, hydrology, water quality data, program recommendations, and additional trip information (Table 1). The November 2016 trip represents the first monitoring event of the winter season.

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 primary water quality results for this month (November 7-9, 2016)) Summary of supplemental water quality results (November 17, 2016 and November 28-29, 2016)) 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
List of Attachments	1. Maps of Hydrometric Stations and Water Quality Sites 2. Site and Station Photos 3. Hydrology Summary Data Tables 4. Water Quality Summary Data Tables (November 7-9, 2016) 5. Water Quality Summary Data Tables (November 17, 2016 and November 28-29, 2016016) 6. Laboratory Certificates of Analysis (COA) & Yukon Environmental Health Services Bacteriological Results.

SITE CONDITIONS

The hydrologic and water quality conditions observed during the November 2016 trip were reflective of early winter. Air temperatures were mild on the November 7-9 trip, ranging from -5 to 1°C, with light snow to clear skies. The subsequent trips had colder air temperatures: -18°C on November 17 and -13°C on November 28th. Weather conditions ranged from clear skies to light snow, with calm to light winds. Ice cover was present to some extent across all watercourses and waterbodies. Seeps and small streams were frozen. Stations and sites along Pony Creek and Back Creek were frozen to bed, as well as some sites and stations along Dome Creek (WQ-DC-DX and H/WQ-DC-D1b). On November 28, 2016, Dome Creek was also dry at site WQ-DC-B and has not been flowing at this location since mid-November according to DES observations.

METEOROLOGY

Meteorological data was collected at the ATM-ROAD station throughout November 2016. EDI conducted a preliminary QA/QC review of the November 2016 data and all sensors appear to be functioning properly. There was snow on site during the November investigation. Snow was undisturbed under the snow depth sensor of the meteorological station at the time of visit on November 8th. No manual snow depth measurement was carried out during the November 7-9th trip.

HYDROLOGY

Seven hydrometric stations provided suitable conditions for discharge measurements during the November 7-9, 2016 trip. A total of 12 discharge measurements were scheduled at the Mount Nansen site and five stations were either frozen to bed or did not provide suitable conditions to measure discharge. Pony Creek site (H-PC-DSP) was frozen to bed, as well as Dome Creek at site H-DC-D1b and Back Creek (H-BC). Dome Creek site conditions at H-DC-B (diversion channel at the bridge) and H-DC-R (at the road) were unsuitable for discharge measurements and water level loggers were removed for the winter period. Flow rates in Victoria Creek were lower at all stations in November compared to the October 2016 results. Continuous water level logger records are available for the following six stations: H-DC-B, H-DC-R, H-VC-U, H-VC-DBC, H-VC-UMN and H-VC-R+290. The review of the continuous hydrometric and barometric data files indicates that all sensors were functioning properly.

Surface water conditions and hydrometric monitoring tasks completed at each station in November 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. November discharge values along Victoria Creek ranged from 0.160 to 0.235 m^3/s. These values were lower than the flows observed in October 2016 which ranged from 0.416 to 0.547 m^3/s, but higher than flow rates in November 2015 which ranged from 0.148 to 0.176 m^3/s.
- Ice was present at flowing creeks throughout the Mount Nansen site. Ice thickness ranged from 0.05 m to 0.10 m at the Victoria Creek stations.
- Flows increased in the downstream direction along Victoria Creek as the contributing watershed area increased.
- Discharge measurements were collected at the two of the five stations along Dome Creek. Salt dilution gauging was used to measure the discharge at the two stations: H-DC-DX+105 and H-DC-M WP, with respective discharges of 0.010 m^3/s and 0.006 m^3/s. There was ice within the channels during the salt tracer measurements, which adds measurement uncertainty to the

discharge values. A volumetric test was also performed at H-DC-M WP and discharge estimate was 0.004 m^3/s.

- Pony Creek station, H-PC-DSP, was dry and the culvert completely frozen.
- Back Creek at station H-BC was dry. A 0.25m thick ice shelf stood 0.3 m above the dry creek bed.
- The H-SEEP volumetric discharge measurement on November 8, 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).

WATER QUALITY

Water quality samples and in-situ data were collected at the scheduled sites with flowing water during the November 2016 trip. A total of 11 sites were sampled (Attachment 4). The drinking water sample, including a bacteriological sample, was collected from the pumphouse well (WQ-PW) on November 9, 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.

Subsequent sampling trips on November 17 and November 28 were carried out to further investigate potential changes in water quality immediately downstream of the tailings pond on Dome Creek.

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 6 and discussed below.

Many results reflect typical early winter conditions at Mount Nansen when water levels have decreased and watercourses are covered in ice.

Water Quality Results Summary

Analysis of the November 7-9, 2016 samples highlighted the following exceedances:

- The WQ-SEEP samples exceeded CCME-AL guidelines for ammonia, total and dissolved arsenic, total and dissolved cadmium, total and dissolved copper, total and dissolved iron, total and dissolved zinc. Total iron and manganese exceeded Mount Nansen EQS.
- Tailings Pond (WQ-TP) samples exceeded CCME-AL guidelines for fluoride, total and dissolved arsenic, total and dissolved cadmium, total and dissolved copper, total lead, total and dissolved zinc.

- On Upper Dome Creek site WQ-DC-DX+105, CCME-AL guidelines were exceeded for fluoride, total and dissolved arsenic, total and dissolved cadmium, total iron, total and dissolved zinc. Total manganese and total zinc exceeded Mount Nansen EQS.
- On Dome Creek diversion channel at the bridge, site WQ-DC-B, CCME-AL guidelines were exceeded for total and dissolved iron, total and dissolved zinc. Total iron and manganese exceeded Mount Nansen EQS.
- On Lower Dome Creek sites, WQ-DC-U and WQ-DC-R, CCME-AL guidelines were exceeded for ammonia, total and dissolved arsenic, total and dissolved cadmium (WQ-DC-U only), total and dissolved iron. Total iron and total manganese exceeded Mount Nansen EQS.
- On all Victoria Creek sites (WQ-VC-U, WQ-VC-DBC, WQ-VC-UMN and WQ-VC-R+290), no parameters exceeded CCME-AL guidelines.
- The bacteriological sample collected at WQ-PW on November 9, 2016 was absent of total coliforms and E. coli. All other sampling results for WQ-PW did not exceed CCME-AL guidelines.

In response to the October 2016 LC50 sampling results (96-hour LC50 result of 73.5% trout survival with a 95% confidence limit between 67.8 and 79.7 % (%v/v)), a LC50 sample and regular water quality sample analysis were collected at WQ-SEEP on November 17, 2016.

- Laboratory analysis for the November 2016 sample estimated a 96-hour LC50 result of 100% trout survival (%v/v). All fish appeared normal with no signs of stress at 96 hours.
- The WQ-SEEP samples exceeded CCME-AL guidelines for ammonia, total and dissolved arsenic, total cadmium, total and dissolved iron. Total iron and manganese exceeded Mount Nansen EQS.

Additional sampling on November 28 was to include sampling of four sites: WQ-SEEP, WQ-DC-B, WQ-DC-U and WQ-DC-DSS. On site it was determined that WQ-DC-B was frozen to bed, and no sample could be collected. However, samples were collected at the remaining three sites. The new sample site, WQ-DC-DSS, is located downstream of site WQ-SEEP and upstream of the diversion channel confluence (approximate location 08V 389742 m E, 6880573 m N). Analysis of the November 28, 2016 samples highlighted the following parameters that exceeded applicable guidelines:

- The WQ-SEEP and WQ-DC-DSS (additional site on Dome Creek downstream of WQ-SEEP) samples exceeded CCME-AL guidelines for ammonia, total and dissolved arsenic, total and dissolved cadmium, total and dissolved iron, total and dissolved zinc. Total iron and manganese exceeded Mount Nansen EQS.
- On Lower Dome Creek sites WQ-DC-U, CCME-AL guidelines were exceeded for ammonia, total and dissolved arsenic, total and dissolved cadmium, total and dissolved iron. Total iron and total manganese exceeded Mount Nansen EQS.

QA/QC Samples

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

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

Replicate Sample(s) – the average RPD of the replicate sample WQ-DC-DX+105-r was 6% with an average difference of 8% for total and 5% for dissolved metals. Arsenic, total cadmium, iron, lead and titanium had RPD>20%.

The average RPD of the replicate sample WQ-DC-U-r was 6% with an average difference of 3% for total and 5% for dissolved metals. Cyanide (weak acid), total cyanide and titanium had RPD>20%.

PROGRAM RECOMMENDATIONS

- During each winter trip, collect photographs and manual snow depth measurements adjacent to the meteorological station compound to confirm snow sensor data.
- Where feasible, EDI will collect concurrent discharge measurements whenever salt tracer tests are completed during the 2016/17 winter season using a secondary method (such as velocity-area or volumetric). The secondary measurement is used to validate the winter measurements if poor hydraulic conditions due to complex ice formations are present.

ADDITIONAL TRIP INFORMATION

Any changes to project scope (i.e. additional sites sampled):	Two additional field trips; the first to re-sample the LC50 at WQ-SEEP on November 16, and the second to sample WQ-SEEP, WQ-DC-U and WQ-DC-DSS on November 28, 2016. All sampling and monitoring was conducted within scope on main trip (November 7-9, 2016). The next trip is scheduled for December 5 – 7, 2016. The next trip will be the tenth of the 2016/2017 Water Resources Investigation, and the second of the winter season.
Any alterations to sample schedule/budget:	None
Additional Comments:	Sites that have now been determined to be dry or frozen to bed will not be visited until the beginning of spring melt.
Wildlife Sightings:	None
Site concerns (safety):	None

ATTACHMENT 1: MAPS OF HYDROMETRIC STATIONS AND WATER QUALITY SITES

388000 389000 390000

6882000 6881000

N

Pony Creek

Buck Creek

Mount Nansen Road

Brown-McDade Pit Lake

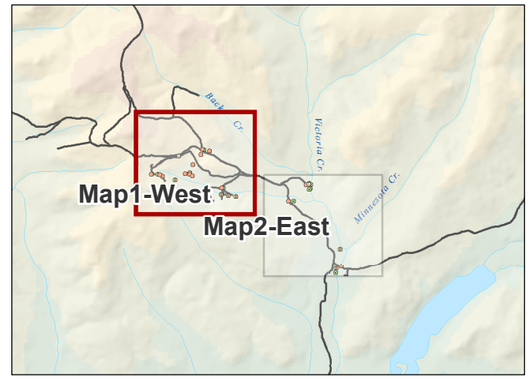
Tailings Facility

Bunkhouse

Mill

Dome Creek

H-PC-DSP
WQ-PC-U
WQ-PC-D
WQ-ADIT-SEEP
WQ-L1
WQ-PIT
ATM-ROAD
WQ-NW-SEEP-02
WQ-L2
WQ-ORE
WQ-LW-SEEP-01
WQ-WR-SEEP-A
WQ-WR-SEEP-B
WQ-DC-DX
H/WQ-DC-DX+105
WQ-MS-S-03
WQ-MS-S-08
WQ-DESS-03
WQ-CH-P-13-01
WQ-DESS-02
WQ-DESS-01
H/WQ-DC-D1B
WQ-DC-B
H-DC-B
H/WQ-TP
H/WQ-SEEP
H-DC-M/WQ-DC-U



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.

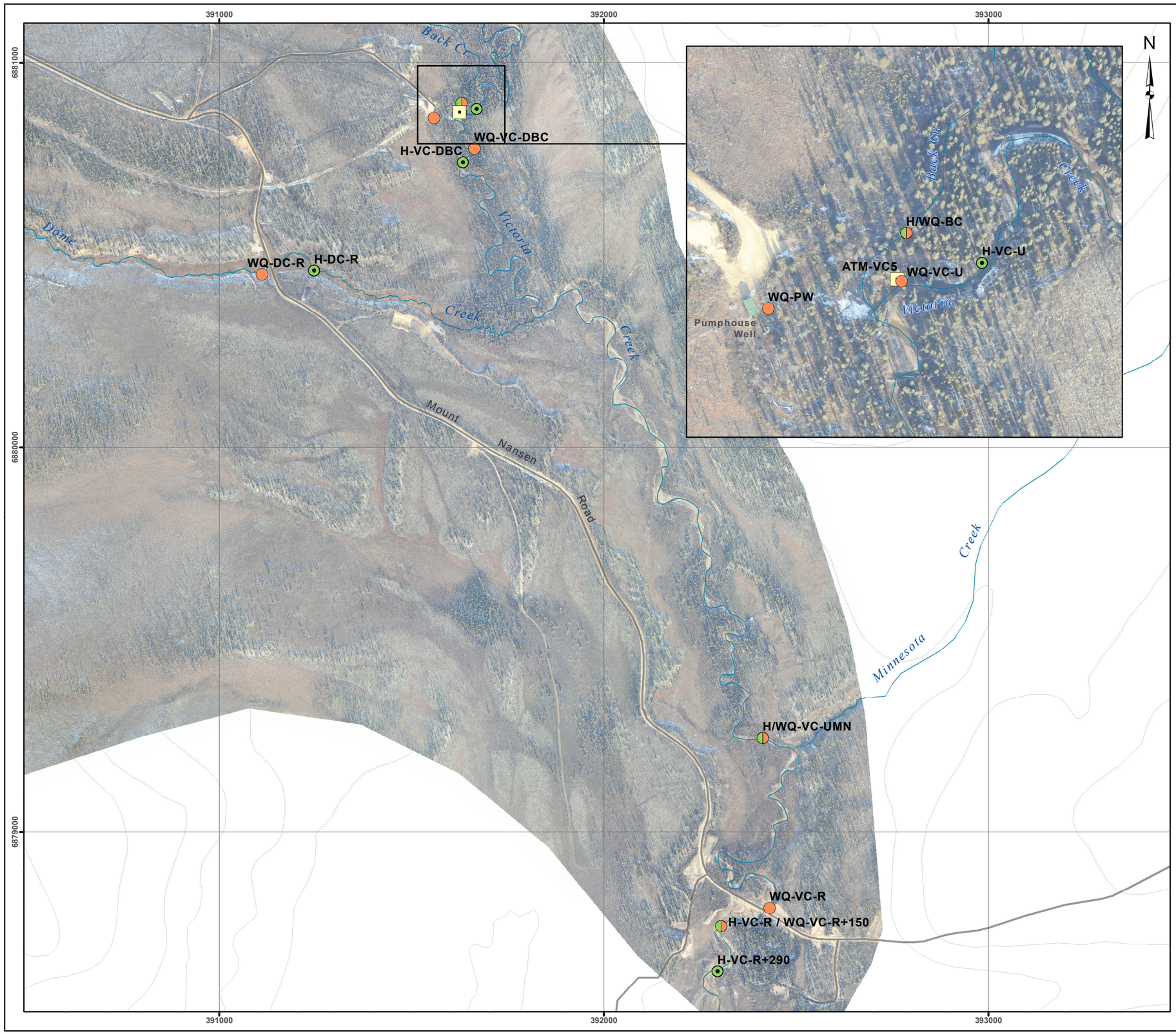
0 50 100 200 300 400 500
metres

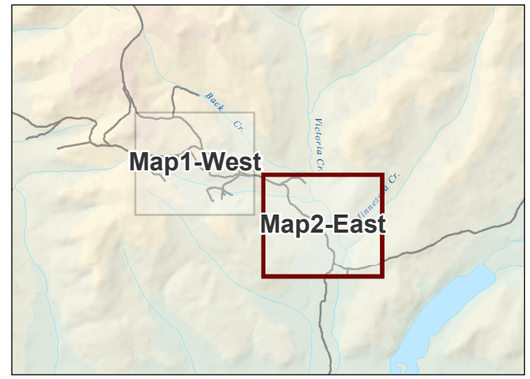
Map Scale = 1:10,000 (printed on 11 x 17)
Map Projection: NAD 1983 UTM Zone 8N

Drawn: MP	Checked: MM/SD	Date: 21/09/2015	MAP 1

Yukon EDI

Path: J:\Yukon\Projects\2015\15Y0146_AAM_Mount_Nansen\Mapping\FinalMaps\Map1_WestSites_2015.mxd





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.

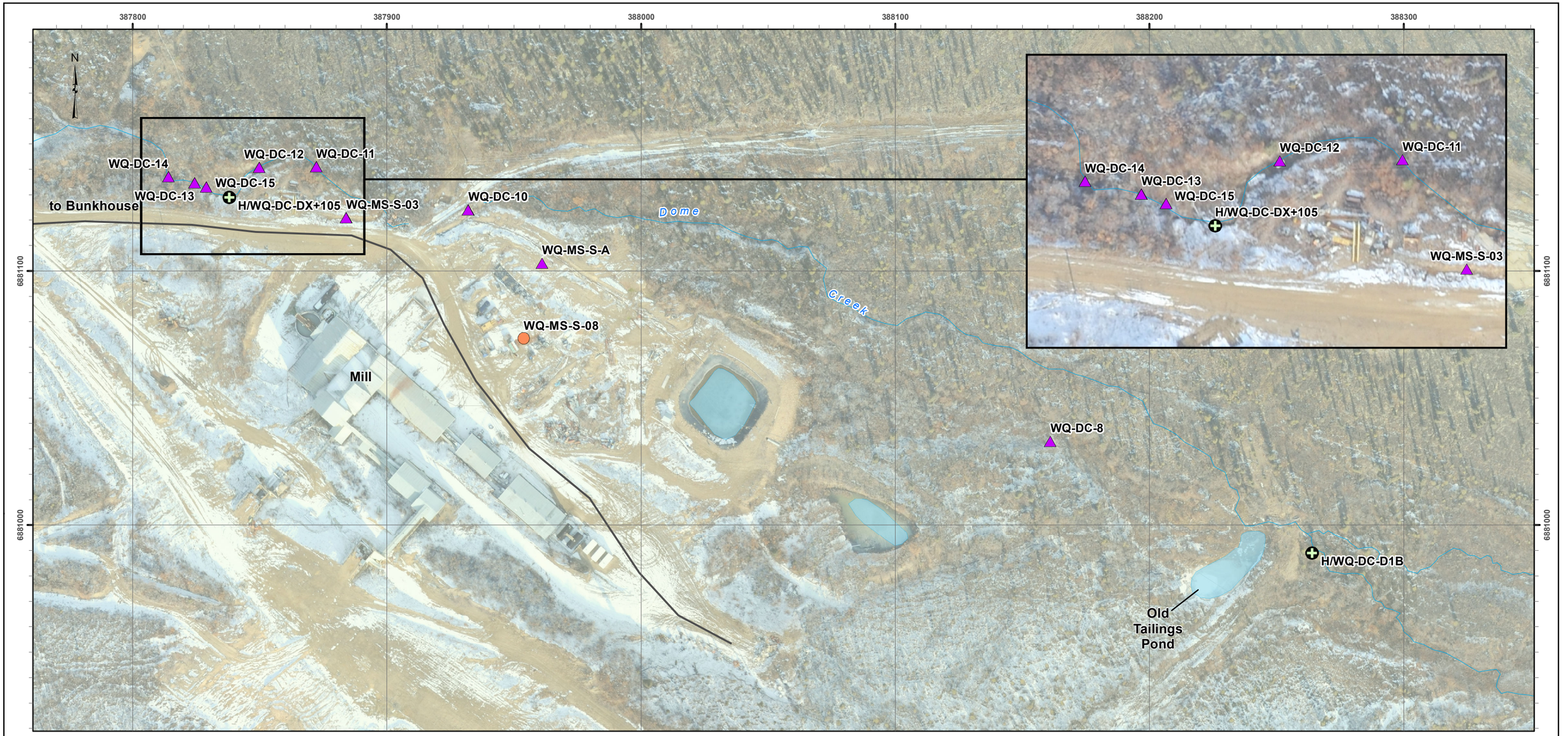
Project data displayed is site specific. Data collected by EDI Environmental Dynamics Inc. (2015) was obtained using Garmin GPS technology.

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	21/09/2015	**MAP 2**

Path: J:\Yukon\Projects\2015\15Y0146_AAM_Mount_Nansen\Mapping\FinalMaps\Map2_EastSites_2015.mxd



Dome Creek Investigation Sites

Legend

- Investigation Site
- Hydrometric Station and Water Quality Site
- Water Quality Site (label e.g. WQ-PC-U)
- Unpaved Road/Access

1 centimetre = 15 metres

Map Projection: North American Datum 1983 UTM Zone 8N

0 20 40 60 80 100

Metres

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.

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

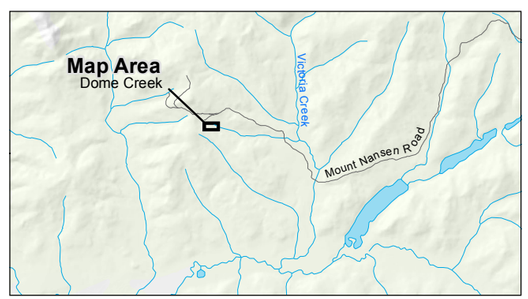
Watercourse, drainage areas and Mount Nansen Road layers digitized / modified by EDI (2011) using orthophotos provided by Yukon Government, Energy, Mines and Resources (2011).

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.

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

Drawn:	Checked:		
MP	MM/SD	**MAP 3**	Date: 23/09/2015



Yukon EDI

Path: J:\Yukon\Projects\2015\15Y0146_AAM_Mount_Nansen\Mapping\FinalMaps\Map3_DomeInvestigationSites_21Sept2015.mxd

ATTACHMENT 2: SITE AND STATION PHOTOS

Photo 1. H-DC-DX+105 – looking upstream at discharge measurement site.

Photo 2. H-DC-DX+105 – looking downstream.

Photo 3. WQ-DC-DX+105 – overview.

Photo 4. H/WQ-DC-D1b – overview, looking downstream (no detectable flow – no sample collected).

Photo 5. WQ-CH-P-13-01 – looking upstream (frozen to bed – no sample collected).

Photo 6. WQ-DC-B – looking upstream.

Photo 7. H-DC-B – looking downstream.

Photo 8. H-DC-B – well removed.

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

Photo 10. H-TP – tailings pond lower staff gauge encased in ice.

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

Photo 12. H-DC-M WP – looking upstream at weir pond.

Photo 13. H-DC-M WP – looking downstream.

Photo 14. WQ-DC-U – overview.

Photo 15. WQ-DC-R – looking upstream.

Photo 16. H-DC-R – looking upstream.

Photo 17. WQ-PC-U – looking downstream (frozen to bed – no sample collected).

Photo 18. WQ-PC-D – looking upstream (frozen to bed – no sample collected).

Photo 19. H-PC-DSP – looking upstream.

Photo 20. H/WQ-BC – looking downstream (frozen to bed – no sample collected).

Photo 21. H-VC-U – looking downstream.

Photo 22. WQ-VC-U – looking upstream.

Photo 23. WQ-VC-U – looking downstream at confluence of Victoria Creek and Back Creek.

Photo 24. WQ-VC-DBC – looking downstream.

Photo 25. H-VC-DBC – looking upstream.

Photo 26. H/WQ-VC-UMN – looking downstream.

Photo 27. WQ-VC-R+150 – looking upstream.

Photo 28. H-VC-R+290 – looking upstream.

Photo 29. WQ-NW-SEEP-02 – overview of sample site (dry – so sample collected).

Photo 30. WQ-PW – looking downstream of pipe.

ATTACHMENT 3: HYDROLOGY SUMMARY DATA TABLES

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
B	Backwater effects (ice related)

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
1510	ATM-VC5	08/11/2016	13:38	N	-	-	-	-	Barologger downloaded at 13:38.
1511	H-PC-DSP	08/11/2016	-	N	-	-	-	-	Dry. Culvert completely frozen. Site conditions were unsuitable for discharge measurements. Ice thickness greater than 0.3 m.
1512	H-DC-DX+105	08/11/2016	16:53	SS	0.010	B	-	-	Site conditions not suitable for volumetric. Salt tracer conducted. Minimal ice on shore 0.01 m. Snow cover portions of creek.
1513	H-DC-D1b	08/11/2016	-	N	-	-	-	-	Over ice conditions present at site. Snow cover on ice 0.01 m indicating ice is building. Now detectable sign of flow. Ice thickness varies greatly but is > 0.3 m.
1514	H-DC-B	08/11/2016	-	N		-	-	-	Over ice conditions present. Layers of ice and water in channel. Site conditions are such that discharge measurements are not feasible. Well removed with assistance from DES excavator. Well removed at 12:04 after equipment removed 40cm of ice. Crew chipped remaining 40cm of ice to retrieve well and logger.
1515	H-DC-M WP	07/11/2016	16:50	SS	0.006	B	-	-	Ice covered stream (0.01-0.04m thick). Snow depth in area 0.12m. Water is light in colour. Concurrent salt tracer and volumetric measurements.
				V	0.004	B	-	-	
1516	H-DC-R	07/11/2016	-	N	-	-	-	-	Multiple layers of ice and water. Ice thickness varies 0.02m to 0.10m with total iced depth approx. 0.30m. Site conditions unsuitable for discharge measurement. Sloped section of site access trail show seepage and ice acumulation above water level of creek. Well was removed.
1517	H-VC-U	08/11/2016	14:35	ADV-MID	0.160	B	2.035	B	Shore ice present. Thickness 0.01m - 0.07m. Snow depth 0.06m.
1518	H-VC-DBC	08/11/2016	13:40	ADV-MID	0.166	B	1.778	B	Layered ice shelf on banks 0.3m above water surface at time of visit. Ice thickness 0.04 - 0.15m thick and in layers with hoar frost between. Ice removed from cross section for discharged measurement.
1519	H-VC-UMN	08/11/2016	11:25	ADV-MID	0.166	B	1.630	B	Reach has 90% ice cover with open riffle section u/s. ice thickness 0.01m- 0.10m. Light snow covering on ice 0.02m. Direct read cable end found frozen in water. Crew removed carefully.
1520	H-VC-R+290	07/11/2016	14:27	ADV-MID	0.235	B	2.451	B	Channel ice covered (0.02- 0.15m). RDB frozen to bed. Snow depth at site 0.10m. Logger not DL at time of visit. Open water leads u/s and d/s.
1521	H-BC	08/11/2016	-	N		-	-	-	Dry. Ice shelf 0.3m above dry creek bed. Ice shelf thickness 0.25m thick. Well removed.

ATTACHMENT 4: WATER QUALITY SUMMARY DATA TABLES – NOVEMBER 7-9, 2016

Water Quality Site	Sample Collected? (Y/N)	Measurement Date	Comments
WQ-SEEP	Yes	07/11/2016	Ice build up around pipe outlet. Snow depth in area <0.10m.
WQ-TP	Yes	07/11/2016	Snow depth on pond 0.15m. Ice thickness 0.20m. Bed to top of water 0.50m. Substrate comprised of fines. Clear ice with minimal air entrapment. Water level with ice surface.
WQ-DC-DX	No	08/11/2016	Site is covered in 0.2m ice frozen to bed. Unable to sample at location.
WQ-DC-DX+105	Yes	08/11/2016	Flow at site is moderate. Volumetric trough is trapped in ice. Minimal ice cover (0.01m) and mainly over hanging snow to a depth of 0.20m.
WQ-DC-D1b	No	08/11/2016	Over ice conditions present at site. Snow cover on ice 0.01m indicating ice is building. Now detectable sign of flow. Ice thickness varies greatly but is >0.30m. Unable to collect water sample.
WQ-DC-B	Yes	08/11/2016	Over ice conditions present. Ice thickness >0.65m. Layers of ice with water between. Not detectable flow but water elevation rose in hole. Sample collected. Snow on ice present downstream of sampling location. Fresh ice upstream of sampling location.
WQ-DC-U	Yes	07/11/2016	Ice covered stream (0.01-0.04m thick). Snow depth in area 0.12m. Water is light in colour.
WQ-DC-R	Yes	07/11/2016	Upstream site unsuitable for sampling. Stream frozen to bed and significant over ice present. Unable to find flowing water. Water sample collected 4m upstream of H-DC-R well. Multiple layers of ice and water. Ice thickness varies 0.02m to 0.10m with total ice depth ~0.30m. Low flow detected when cutting hole. Crew let hole settle for 20min before sampling. Turbidity cleared during settling period.
WQ-VC-U	Yes	08/11/2016	Ice covered stream. Ice free riffle immediately downstream of sample location. Ice thickness 0.01m - 0.04m.
WQ-VC-R+150	Yes	07/11/2016	Ice covered channel with an open lead at downstream riffle. Ice thickness from 0.01m to 0.05m. Snow depth of 0.10m.
WQ-VC-DBC	Yes	08/11/2016	Ice covered stream. Open water at upstream riffle. Ice thickness 0.01m - 0.07m. NH3 preserved at 15:15 due to missing preservative at time of sampling.
WQ-VC-UMN	Yes	08/11/2016	Shore ice present at sampling location, ice thickness ranges from 0.01m to 0.10m.
WQ-BC	No	08/11/2016	Sample not collected, creek dry. Elevated ice shelf. 0.25m thick.
WQ-PC-U	No	08/11/2016	No detectable flow. Pockets of standing water between layers of ice. Over ice conditions present. Bare ice directly upstream. Conditions not suitable for sampling. Ice thickness greater then 0.15m. Downstream culvert frozen with do detectable flow.
WQ-PC-D	No	08/11/2016	Frozen to bed. Ice thickness 0.35m thick. Over ice conditions present under 0.04 m of snow upstream from sampling site.
WQ-CH-P-13-01	No	08/11/2016	Over ice conditions at sampling location. Unable to detect water. No snow present at sampling location. Snow downstream of sampling location 0.02m deep. Sample not collected. Ice thickness >0.30m.
WQ-NW-SEEP-02	No	09/11/2016	Site dry. No sign of water at sampling location. Sample not collected.
WQ-PW	Yes	09/11/2016	Flow rate moderate. Minimal ice accumulation at site.

Summary of Water Quality Results for the November 7 - 9, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1840282-6 WQ-SEEP 07/11/2016 17:30	L1840282-17 WQ-TP 07/11/2016 17:55	L1840282-18 WQ-DC-DX+105 08/11/2016 16:30	L1840282-19 WQ-DC-DX+105-R 08/11/2016 16:45	QA/QC WQ-DC-DX+105 Replicate Analysis	L1840282-20 WQ-DC-B 08/11/2016 08:50	L1840282-11 WQ-DC-U 07/11/2016 15:50	L1840282-5 WQ-DC-U-R 07/11/2016 16:00	QA/QC WQ-DC-U Replicate Analysis	L1840282-2 WQ-DC-R 07/11/2016 15:20
Temperature (in-situ)	°C	-	-	-	0.5	1.1	0.4	0.4	-	1.8	0.3	0.3	-	-0.1
Specific Conductivity (in-situ)	µS/cm	-	-	-	1,606	1,676	1,134	1,134	-	2,303	1,426	1,426	-	1,140
pH (in-situ)	pH	6.5 - 9.0	6.0 - 8.5	-	7.10	7.69	7.03	7.03	-	6.82	7.17	7.17	-	6.95
Dissolved Oxygen (in-situ)	mg/L	-	-	-	6.48	11.36	2.48	2.48	-	5.47	8.22	8.22	-	5.27
Turbidity (In-situ)	NTU	-	-	-	5.15	4.21	7.40	7.40	-	4.54	1.70	1.70	-	2.08
Colour, True	CU	15	-	5					-				-	
Conductivity	µS/cm	-	-	2	1550	1610	1110	1110	0%	2190	1380	1370	1%	1080
Hardness (as CaCO3)	mg/L	-	-	0.5	881	986	637	668	5%	1440	748	791	6%	610
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.15	7.95	7.64	7.81	2%	7.63	7.66	7.67	0%	7.36
Total Suspended Solids	mg/L	-	50	3	29.1	3.2	4.3	3.9	<2xDL	5.5	9.7	11.1	<2xDL	8.7
Total Dissolved Solids	mg/L	-	-	1	1200	1360	789	800	1%	1870	1030	1050	2%	789
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	285	149	274	279	2%	346	258	262	2%	218
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<DL	<1.0	<1.0	<1.0	<DL	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<DL	<1.0	<1.0	<1.0	<DL	<1.0
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	285	149	274	279	2%	346	258	262	2%	218
Ammonia, Total (as N)	mg/L	0.75	-	0.005	***4.35***	0.0319	0.0207	0.0183	<2xDL	0.516	***3.36***	***3.31***	1%	***1.09***
Bromide (Br)	mg/L	-	-	0.05	<0.25	<0.50	<0.25	<0.25	<DL	<1.0	<0.25	<0.25	<DL	<0.25
Chloride (Cl)	mg/L	120	-	0.5	<2.5	<5.0	<2.5	<2.5	<DL	<10	<2.5	<2.5	<DL	<2.5
Fluoride (F)	mg/L	0.12	-	0.02	<0.10	***0.28***	***0.17***	***0.17***	0%	<0.40	0.11	0.11	0%	<0.10
Nitrate (as N)	mg/L	13	-	0.005	1.04	<0.050	<0.025	<0.025	<DL	<0.10	0.418	0.42	0%	0.254
Nitrite (as N)	mg/L	0.06	-	0.001	0.0317	<0.010	<0.0050	<0.0050	<DL	<0.020	0.0193	0.0194	1%	0.0112
Sulfate (SO4)	mg/L	-	-	0.5	646	876	395	391	1%	1150	564	565	0%	411
Anion Sum	meq/L	-	-	-	19.2	21.2	13.7	13.7	<DL	30.9	16.9	17	<DL	12.9
Cation Sum	meq/L	-	-	-	20.4	21.1	13.1	13.7	<DL	29.9	16.8	17.6	<DL	13.6
Cation - Anion Balance	%	-	-	-	2.9	-0.3	-2.3	0	<DL	-1.8	-0.4	1.7	<DL	2.5
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	0.0123	<0.0050	<0.0050	<0.0050	<DL	<0.0050	0.0246	0.0081	**101%**	<0.0050
Cyanide, Total	mg/L	-	0.3	0.005	0.0504	<0.0050	<0.0050	<0.0050	<DL	<0.0050	0.0314	0.017	**60%**	<0.0050
Cyanate	mg/L	-	-	0.2	<0.20	0.28	<0.20	<0.20	<DL	<0.20	<2.0	<0.20	<DL	<0.20
Thiocyanate (SCN)	mg/L	-	-	0.5	5.13	<0.50	<0.50	<0.50	<DL	<0.50	1.57	1.56	<2xDL	0.55
Aluminum (Al)-Total	mg/L	0.1	-	0.003	0.0134	0.0212	0.0414	0.0415	0%	0.0037	0.0203	0.0216	6%	0.0175
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.00051	0.0398	0.00907	0.00907	0%	0.00217	0.00032	0.00033	<2xDL	0.00089
Arsenic (As)-Total	mg/L	0.005	-	0.0001	***0.0516***	***0.129***	***0.0601***	***0.0464***	**26%**	0.00498	***0.0408***	***0.0403***	1%	***0.0456***
Barium (Ba)-Total	mg/L	-	1.0	0.00005	0.0555	0.0172	0.0117	0.0116	1%	0.067	0.0612	0.0606	1%	0.0672
Beryllium (Be)-Total	mg/L	-	-	0.00002	<0.000020	<0.000020	<0.000020	<0.000020	<DL	<0.000020	<0.000020	<0.000020	<DL	<0.000020
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.000050	0.000083	<0.000050	<0.000050	<DL	<0.000050	<0.000050	<0.000050	<DL	<0.000050
Boron (B)-Total	mg/L	-	-	0.01	0.049	0.084	<0.010	<0.010	<DL	0.02	0.036	0.035	<2xDL	0.017
Cadmium (Cd)-Total *(Lab Result)*	mg/L	0.00009	0.02	0.00001	***0.000497***	***0.000571***	***0.00239***	***0.00196***	**20%**	0.0000701	***0.000129***	***0.000127***	2%	0.000067
Cadmium (Cd)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	-	*0.00037*	*0.00037*	*0.00037*	-	*0.00037*
Calcium (Ca)-Total	mg/L	-	-	0.05	252	309	176	174	1%	350	224	219	2%	159
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	0.00051	0.00014	<0.00010	<0.00010	<DL	0.00013	0.00035	0.00036	<2xDL	0.0004
Cobalt (Co)-Total	mg/L	-	-	0.0001	0.00767	0.00051	0.00084	0.00081	4%	0.00103	0.00506	0.00491	3%	0.00267
Copper (Cu)-Total *(Lab Result)*	mg/L	0.002	0.2	0.0005	***0.00326***	***0.0255***	<0.00050	<0.00050	<DL	<0.00050	0.00122	0.00121	<2xDL	0.00082
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*
Iron (Fe)-Total	mg/L	0.3	1	0.01	***11.5***	0.228	***0.56***	***0.414***	**30%**	***2.5***	***4.38***	***4.3***	2%	***4.08***
Lead (Pb)-Total *(Lab Result)*	mg/L	0.001	0.1	0.00005	<0.000050	***0.00686***	0.000355	0.000237	**40%**	<0.000050	<0.000050	0.000055	<DL	0.000144
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*
Lithium (Li)-Total	mg/L	-	-	0.0005	<0.0010	0.0113	0.0089	0.0086	3%	0.0056	<0.0010	<0.0010	<DL	<0.0010
Magnesium (Mg)-Total	mg/L	-	-	0.1	57.7	60.2	60.9	60.4	1%	168	60.9	60.1	1%	51.6
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	***5.8***	0.132	***1.17***	***1.14***	3%	***1.83***	***4.82***	***4.7***	3%	***2.61***
Mercury (Hg)-Total	mg/L	0.0000026	0.005	0.00001	<0.0000050	0.0000078	<0.0000050	<0.0000050	<DL	<0.0000050	<0.0000050	<0.0000050	<DL	<0.0000050
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	0.00107	0.00147	0.000377	0.000367	3%	0.000354	0.000809	0.000804	1%	0.000377
Nickel (Ni)-Total *(Lab Result)*	mg/L	0.025	0.3	0.0005	0.00351	0.00096	0.00156	0.0016	<2xDL	0.00135	0.00211	0.00215	<2xDL	0.00137
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*
Phosphorus (P)-Total	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<DL	<0.050	<0.050	<0.050	<DL	<0.050
Potassium (K)-Total	mg/L	-	-	0.1	6.4	21.1	3.63	3.56	2%	5.39	5.36	5.3	1%	4.82
Selenium (Se)-Total	mg/L	0.001	-	0.0001	0.000289	0.000065	<0.000050	<0.000050	<DL	0.000079	0.000215	0.000184	<2xDL	0.000115
Silicon (Si)-Total	mg/L	-	-	0.05	7.57	4.55	6.83	6.77	1%	9.94	7.15	7.04	2%	8.02
Silver (Ag)-Total	mg/L	0.00025	0.1	0.00001	0.000026	0.000178	<0.000010	<0.000010	<DL	<0.000010	<0.000010	0.00001	<DL	<0.000010
Sodium (Na)-Total	mg/L	-	-	0.05	35.8	19.7	5.27	5.28	0%	18.1	28.1	27.6	2%	21.1
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.739	0.849	0.428	0.429	0%	1.26	0.688	0.691	0%	0.527
Sulfur (S)-Total	mg/L	-	-	0.5	239	330	143	144	1%	451	212	210	1%	151
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	<0.000010	0.000156	0.000107	0.000095	12%	<0.000010	<0.000010	<0.000010	<DL	<0.000010
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<DL	<0.00010	<0.00010	<0.00010	<DL	<0.00010
Titanium (Ti)-Total	mg/L	-	-	0.0003	0.00087	<0.00030	0.00177	0.0022	**22%**	<0.00030	0.00126	0.00154	**20%**	0.00079
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.00233	0.00142	0.00434	0.00442	2%	0.00438	0.00162	0.00164	1%	0.000986
Vanadium (V)-Total	mg/L	-	-	0.0005	0.00201	<0.00050	<0.00050	<0.00050	<DL	<0.00050	0.00104	0.00106	<2xDL	0.00073
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	***0.0554***	***0.0733***	***0.77***	***0.765***	1%	***0.036***	0.0157	0.0158	1%	0.0119
Zirconium (Zr)-Total	mg/L	-	-	0.0003	0.00065	<0.00030	<0.00030	<0.00030	<DL	<0.00030	0.00034	0.00034	<2xDL	0.0003

Summary of Water Quality Results for the November 7 - 9, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1840282-6 WQ-SEEP 07/11/2016 17:30	L1840282-17 WQ-TP 07/11/2016 17:55	L1840282-18 WQ-DC-DX+105 08/11/2016 16:30	L1840282-19 WQ-DC-DX+105-R 08/11/2016 16:45	QA/QC WQ-DC-DX+105 Replicate Analysis	L1840282-20 WQ-DC-B 08/11/2016 08:50	L1840282-11 WQ-DC-U 07/11/2016 15:50	L1840282-5 WQ-DC-U-R 07/11/2016 16:00	QA/QC WQ-DC-U Replicate Analysis	L1840282-2 WQ-DC-R 07/11/2016 15:20
Aluminum (Al)-Dissolved	mg/L	0.1	-	0.001	0.0096	0.0024	<0.0010	<0.0010	<DL	0.0023	0.0084	0.0075	11%	0.014
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	0.00054	0.0392	0.00876	0.00901	3%	0.0021	0.0003	0.00033	<2xDL	0.00089
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	***0.0487***	***0.104***	***0.0177***	***0.0183***	3%	0.00475	***0.0377***	***0.039***	3%	***0.0454***
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0604	0.0178	0.0107	0.0118	10%	0.0642	0.0582	0.0646	10%	0.0751
Beryllium (Be)-Dissolved	mg/L	-	-	0.00002	<0.000020	<0.000020	<0.000020	<0.000020	<DL	<0.000040	<0.000020	<0.000020	<DL	<0.000020
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.000050	<0.000050	<0.000050	<0.000050	<DL	<0.00010	<0.000050	<0.000050	<DL	<0.000050
Boron (B)-Dissolved	mg/L	-	-	0.01	0.05	0.083	<0.010	<0.010	<DL	<0.020	0.032	0.037	<2xDL	0.018
Cadmium (Cd)-Dissolved *(Lab Result)*	mg/L	0.00009	-	0.00001	***0.000433***	***0.00045***	***0.000627***	***0.000601***	4%	0.000079	***0.000123***	***0.000107***	14%	0.0000558
Cadmium (Cd)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.00037*	*0.00037*	*0.00037*	*0.00037*	-	*0.00037*	*0.00037*	*0.00037*	-	*0.00037*
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	262	301	165	174	5%	327	210	226	7%	162
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	0.00042	<0.00010	<0.00010	<0.00010	<DL	<0.00020	0.00019	0.00028	<2xDL	0.00032
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	0.00708	0.00047	0.00074	0.00075	1%	0.00098	0.0046	0.00431	7%	0.00239
Copper (Cu)-Dissolved *(Lab Result)*	mg/L	0.002	-	0.0002	***0.00224***	***0.0208***	<0.00020	<0.00020	<DL	<0.00040	0.00095	0.00089	<2xDL	0.00066
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*
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	***10.3***	0.024	0.122	0.126	3%	***1.82***	***3.68***	***3.58***	3%	***3.67***
Lead (Pb)-Dissolved *(Lab Result)*	mg/L	0.001	-	0.00005	<0.000050	0.00062	<0.000050	<0.000050	<DL	<0.00010	<0.000050	<0.000050	<DL	<0.000050
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*
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	<0.0010	0.0132	0.0083	0.0088	6%	0.0054	<0.0010	<0.0010	<DL	<0.0010
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	55.3	56.6	54.4	56.8	4%	152	54.4	54.8	1%	49.8
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	5.58	0.113	1.05	1.09	4%	1.75	4.38	4.3	2%	2.54
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<DL	<0.0000050	<0.0000050	<0.0000050	<DL	<0.0000050
Molybdenum (Mo)-Dissolved	mg/L	0.0073	-	0.00005	0.000874	0.00122	0.000316	0.00033	4%	0.0003	0.000688	0.000687	0%	0.00033
Nickel (Ni)-Dissolved *(Lab Result)*	mg/L	0.025	-	0.0005	0.00303	0.00081	0.00144	0.00138	<2xDL	0.0012	0.00192	0.00175	<2xDL	0.00121
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*
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<DL	<0.10	<0.050	<0.050	<DL	<0.050
Potassium (K)-Dissolved	mg/L	-	-	0.1	6.84	21.5	3.42	3.74	9%	5.11	4.96	5.33	7%	5.06
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	0.000292	0.000087	<0.000050	<0.000050	<DL	<0.00010	0.000204	0.000179	<2xDL	0.00014
Silicon (Si)-Dissolved	mg/L	-	-	0.05	7.98	4.63	6.37	6.9	8%	9.65	6.69	7.07	6%	8.31
Silver (Ag)-Dissolved	mg/L	0.00025	-	0.00001	0.000011	0.000052	<0.000010	<0.000010	<DL	<0.000020	<0.000010	<0.000010	<DL	<0.000010
Sodium (Na)-Dissolved	mg/L	-	-	0.05	34.6	18.9	4.82	5.02	4%	16.7	25.6	25.5	0%	20.6
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.683	0.754	0.401	0.41	2%	1.18	0.652	0.63	3%	0.485
Sulfur (S)-Dissolved	mg/L	-	-	0.5	229	320	126	137	8%	405	184	192	4%	141
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	0.000138	0.000079	0.000079	0%	<0.000020	<0.000010	<0.000010	<DL	<0.000010
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<DL	<0.00020	<0.00010	<0.00010	<DL	<0.00010
Titanium (Ti)-Dissolved	mg/L	-	-	0.0003	0.00086	<0.00030	<0.00030	<0.00030	<DL	<0.00060	0.00057	0.00058	<2xDL	0.00064
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.0021	0.00121	0.00391	0.00397	2%	0.00393	0.0015	0.00144	4%	0.000897
Vanadium (V)-Dissolved	mg/L	-	-	0.001	0.00176	<0.00050	<0.00050	<0.00050	<DL	<0.0010	0.00084	0.00084	<2xDL	0.00066
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	***0.0541***	***0.0635***	***0.714***	***0.761***	6%	***0.0351***	0.015	0.0152	1%	0.0121
Zirconium (Zr)-Dissolved	mg/L	-	-	0.0003	0.00059	<0.00030	<0.00030	<0.00030	<DL	<0.00060	0.00032	0.00033	<2xDL	<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

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

Notes:

QA/QC Comments:

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

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

QA/QC Replicate Analysis -

The average RPD of the replicate sample WQ-DC-DX+105-r was 6% with an average difference of 8% for total and 5% for dissolved metals. Arsenic, total cadmium, iron, lead and titanium had RPD>20%.

The average RPD of the replicate sample WQ-DC-U-r was 6% with an average difference of 3% for total and 5% for dissolved metals. Cyanide (weak acid), total cyanide and total titanium had RPD>20%.

Summary of Water Quality Results for the November 7 - 9, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1840282-3 WQ-VC-U 08/11/2016 13:30	L1840282-1 WQ-VC-R+150 07/11/2016 13:55	L1840282-4 WQ-VC-DBC 08/11/2016 13:05	L1840282-8 WQ-VC-UMN 07/11/2016 10:25	L1840282-9 WQ-PW 09/11/2016 09:45	L1840282-10 WQ-FIELD BLANK 09/11/2016 09:45
Temperature (in-situ)	°C	-	-	-	0.1	0.0	0.1	0.0		0.7
Specific Conductivity (in-situ)	µS/cm	-	-	-	216	226	216	236		363
pH (in-situ)	pH	6.5 - 9.0	6.0 - 8.5	-	7.41	6.83	7.44	7.43		6.82
Dissolved Oxygen (in-situ)	mg/L	-	-	-	10.25	10.32	10.46	10.63		3.52
Turbidity (In-situ)	NTU	-	-	-	0.02	1.81	0.32	0.95		0.00
Colour, True	CU	15	-	5					<5.0	
Conductivity	µS/cm	-	-	2	214	222	214	233	352	<2.0
Hardness (as CaCO3)	mg/L	-	-	0.5	102	109	105	114	189	<0.50
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.88	7.62	7.74	7.78	7.85	***5.43***
Total Suspended Solids	mg/L	-	50	3	<3.0	<3.0	<3.0	<3.0		<3.0
Total Dissolved Solids	mg/L	-	-	1	114	123	117	128	203	<1.0
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	95.6	92.4	96.7	96.7		<1.0
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0		<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0		<1.0
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	95.6	92.4	96.7	96.7	161	<1.0
Ammonia, Total (as N)	mg/L	0.75	-	0.005	<0.0050	0.0084	<0.0050	<0.0050		<0.0050
Bromide (Br)	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050		<0.050
Chloride (Cl)	mg/L	120	-	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride (F)	mg/L	0.12	-	0.02	0.05	0.052	0.05	0.052	0.103	<0.020
Nitrate (as N)	mg/L	13	-	0.005	0.149	0.127	0.148	0.136	0.122	<0.0050
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Sulfate (SO4)	mg/L	-	-	0.5	18.3	25.4	18.6	26.9	30.6	<0.30
Anion Sum	meq/L	-	-	-	2.3	2.39	2.33	2.5		<0.10
Cation Sum	meq/L	-	-	-	2.16	2.32	2.22	2.42		<0.10
Cation - Anion Balance	%	-	-	-	-3.3	-1.4	-2.4	-1.7		0
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	<0.0050	<0.0050	<0.0050	<0.0050		<0.0050
Cyanide, Total	mg/L	-	0.3	0.005	<0.0050	<0.0050	<0.0050	<0.0050		<0.0050
Cyanate	mg/L	-	-	0.2	<0.20	<0.20	<0.20	<0.20		<0.20
Thiocyanate (SCN)	mg/L	-	-	0.5	<0.50	<0.50	<0.50	<0.50		<0.50
Aluminum (Al)-Total	mg/L	0.1	-	0.003	0.0328	0.0356	0.0176	0.0324	<0.010	<0.0030
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	<0.00010	0.00023	<0.00010	0.0002	<0.00050	<0.00010
Arsenic (As)-Total	mg/L	0.005	-	0.0001	0.00031	0.00092	0.00029	0.00086	0.0004	<0.00010
Barium (Ba)-Total	mg/L	-	1.0	0.00005	0.0738	0.0718	0.0724	0.0709	0.082	<0.000050
Beryllium (Be)-Total	mg/L	-	-	0.00002	<0.000020	<0.000020	<0.000020	<0.000020		<0.000020
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.000050	<0.000050	<0.000050	<0.000050		<0.000050
Boron (B)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.10	<0.010
Cadmium (Cd)-Total ***(Lab Result)***	mg/L	0.00009	0.02	0.00001	0.0000178	0.0000215	0.0000173	0.0000243	<0.00020	<0.0000050
Cadmium (Cd)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.00016*	*0.00017*	*0.00017*	*0.00018*	*0.00027*	*0.00037*
Calcium (Ca)-Total	mg/L	-	-	0.05	27.7	28.5	27.9	29.2	42.3	<0.050
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	0.00012	0.00013	<0.00010	0.00012	<0.0020	<0.00010
Cobalt (Co)-Total	mg/L	-	-	0.0001	<0.00010	0.00011	<0.00010	<0.00010		<0.00010
Copper (Cu)-Total ***(Lab Result)***	mg/L	0.002	0.2	0.0005	0.00098	0.00115	0.00095	0.00107	<0.0010	<0.00050
Copper (Cu)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.0024*	*0.0025*	*0.0025*	*0.0026*	*0.0040*	*0.0040*
Iron (Fe)-Total	mg/L	0.3	1	0.01	0.068	0.14	0.042	0.067	<0.030	<0.010
Lead (Pb)-Total ***(Lab Result)***	mg/L	0.001	0.1	0.00005	<0.000050	0.000169	<0.000050	0.000176	0.00064	<0.000050
Lead (Pb)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00005*	*0.00326*	*0.00355*	*0.00339*	*0.00376*	*0.00700*	*0.00700*
Lithium (Li)-Total	mg/L	-	-	0.0005	<0.0010	<0.0010	<0.0010	<0.0010		<0.0010
Magnesium (Mg)-Total	mg/L	-	-	0.1	10.3	9.99	9.99	10.4	20.2	<0.10
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	0.0607	0.0567	0.055	0.0601	<0.0020	<0.00010
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.00020	<0.0000050
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	0.00042	0.000403	0.000426	0.000401		<0.000050
Nickel (Ni)-Total ***(Lab Result)***	mg/L	0.025	0.3	0.0005	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050
Nickel (Ni)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.0970*	*0.1020*	*0.0992*	*0.1056*	*0.1500*	*0.1500*
Phosphorus (P)-Total	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050		<0.050
Potassium (K)-Total	mg/L	-	-	0.1	0.64	0.7	0.63	0.68	0.94	<0.10
Selenium (Se)-Total	mg/L	0.001	-	0.0001	0.000058	0.000054	0.000058	<0.000050	<0.0010	<0.000050
Silicon (Si)-Total	mg/L	-	-	0.05	6.23	6.09	6	5.94		<0.050
Silver (Ag)-Total	mg/L	0.00025	0.1	0.00001	<0.000010	<0.000010	<0.000010	<0.000010		<0.000010
Sodium (Na)-Total	mg/L	-	-	0.05	2.78	2.98	2.69	2.98	4.8	0.085
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.324	0.298	0.326	0.32		<0.00020
Sulfur (S)-Total	mg/L	-	-	0.5	6.53	8.52	6.57	8.85		<0.50
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010		<0.000010
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010		<0.00010
Titanium (Ti)-Total	mg/L	-	-	0.0003	0.00101	0.00087	0.00043	0.00093		<0.00030
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.000744	0.000642	0.000737	0.000707	0.00169	<0.000010
Vanadium (V)-Total	mg/L	-	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	<0.0030	<0.0030	<0.0030	<0.0030	<0.050	<0.0030
Zirconium (Zr)-Total	mg/L	-	-	0.0003	<0.00030	<0.00030	<0.00030	<0.00030		<0.00030

Summary of Water Quality Results for the November 7 - 9, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1840282-3 WQ-VC-U 08/11/2016 13:30	L1840282-1 WQ-VC-R+150 07/11/2016 13:55	L1840282-4 WQ-VC-DBC 08/11/2016 13:05	L1840282-8 WQ-VC-UMN 07/11/2016 10:25	L1840282-9 WQ-PW 09/11/2016 09:45	L1840282-10 WQ-FIELD BLANK 09/11/2016 09:45
Aluminum (Al)-Dissolved	mg/L	0.1	-	0.001	0.0062	0.0104	0.0065	0.0063		<0.0010
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	<0.00010	0.00021	<0.00010	0.00018		<0.00010
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	0.00026	0.00076	0.00024	0.00068		<0.00010
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0674	0.0708	0.07	0.0713		<0.000050
Beryllium (Be)-Dissolved	mg/L	-	-	0.00002	<0.000020	<0.000020	<0.000020	<0.000020		<0.000020
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.000050	<0.000050	<0.000050	<0.000050		<0.000050
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010		<0.010
Cadmium (Cd)-Dissolved *(Lab Result)*	mg/L	0.00009	-	0.00001	0.0000128	0.0000203	0.0000192	0.0000194		<0.0000050
Cadmium (Cd)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.00016*	*0.00017*	*0.00017*	*0.00018*	*0.00027*	*0.00037*
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	25.7	28.4	26.9	29.4		<0.050
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	<0.00010	0.00012	<0.00010	<0.00010		<0.00010
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010		<0.00010
Copper (Cu)-Dissolved *(Lab Result)*	mg/L	0.002	-	0.0002	0.00082	0.001	0.00085	0.00094		<0.00020
Copper (Cu)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.002*	*0.002*	*0.003*	*0.002*	*0.003*	*0.004*	*0.004*
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	0.018	0.055	0.019	0.022		<0.010
Lead (Pb)-Dissolved *(Lab Result)*	mg/L	0.001	-	0.00005	<0.000050	<0.000050	<0.000050	<0.000050		<0.000050
Lead (Pb)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00005*	*0.00326*	*0.00355*	*0.00339*	*0.00376*	*0.00700*	*0.00700*
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	<0.0010	<0.0010	<0.0010	<0.0010		<0.0010
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	9.07	9.19	9.08	9.74		<0.10
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.0512	0.0527	0.0504	0.0545		<0.00010
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.0000050	<0.0000050	<0.0000050	<0.0000050		<0.0000050
Molybdenum (Mo)-Dissolved	mg/L	0.0073	-	0.00005	0.000372	0.00034	0.000358	0.000352		<0.000050
Nickel (Ni)-Dissolved *(Lab Result)*	mg/L	0.025	-	0.0005	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050
Nickel (Ni)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.0970*	*0.1020*	*0.0992*	*0.1056*	*0.1500*	*0.1500*
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050		<0.050
Potassium (K)-Dissolved	mg/L	-	-	0.1	0.59	0.71	0.63	0.68		<0.10
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	<0.000050	<0.000050	0.000052	<0.000050		<0.000050
Silicon (Si)-Dissolved	mg/L	-	-	0.05	5.59	6.45	6.1	6.18		<0.050
Silver (Ag)-Dissolved	mg/L	0.00025	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010		<0.000010
Sodium (Na)-Dissolved	mg/L	-	-	0.05	2.53	2.93	2.62	3		0.132
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.302	0.295	0.313	0.314		<0.00020
Sulfur (S)-Dissolved	mg/L	-	-	0.5	5.19	8.56	6.09	8.85		<0.50
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010		<0.000010
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010		<0.00010
Titanium (Ti)-Dissolved	mg/L	-	-	0.0003	<0.00030	<0.00030	<0.00030	<0.00030		<0.00030
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.000627	0.000596	0.000679	0.000666		<0.000010
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.00050	<0.00050	<0.00050	<0.00050		<0.00050
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	<0.0010	0.0011	<0.0010	<0.0010		0.0011
Zirconium (Zr)-Dissolved	mg/L	-	-	0.0003	<0.00030	<0.00030	<0.00030	<0.00030		<0.00030

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

COLOUR KEY:

Exceeds CCME Guideline

Exceeds MN Effluent Discharge Standards

Exceeds both CCME and MN Standards

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

ATTACHMENT 5: WATER QUALITY SUMMARY DATA TABLES – NOVEMBER 17 AND 28, 2016

Water Quality Site	Sample Collected? (Y/N)	Measurement Date	Comments
WQ-SEEP	Yes	17/11/2016	Additional sampling of standard suite of water quality parameters and for an LC-50 test conducted. Sampling conditions were as expected, no difficulties encountered.
WQ-SEEP	Yes	28/11/2016	Conditions normal for time of year with open water just downstream of seep outflow, some thin ice along stream margins.
WQ-DC-B	No	28/11/2016	Creek bed was dry; has been recently excavated due to the build-up of overflow ice. Denison indicates there has been no flow in this channel for the past two weeks.
WQ-DC-U	Yes	28/11/2016	Thin ice present over stream (approximately 3 cm), snow depth in the area was approximately 5 cm
WQ-DC-DSS	Yes	28/11/2016	Considerable overflow ice build-up. Ice thickness was approximately 1.3 m.

Summary of Water Quality Results for the November 17 and 28, 2016 Trips.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1859859-1 WQ-SEEP 17/11/2016 08:30	L1864060-1 WQ-SEEP 28/11/2016 13:00	L1864060-2 WQ-DC-U 28/11/2016 11:50	L1864060-3 WQ-DC-DSS 28/11/2016 12:10
Temperature (in-situ)	°C	-	-	-	0.0	0.3	0.1	-0.1
Specific Conductivity (in-situ)	µS/cm	-	-	-	1,670	1,459	1,674	1,937
pH (in-situ)	pH	6.5 - 9.0	6.0 - 8.5	-	6.84	7.18	7.16	7.14
Dissolved Oxygen (in-situ)	mg/L	-	-	-				
Turbidity (In-situ)	NTU	-	-	-	8.84	15.87	7.08	9.36
Colour, True	CU	15	-	5				
Conductivity	µS/cm	-	-	2	1540	1610	1690	1930
Hardness (as CaCO3)	mg/L	-	-	0.5	874	880	962	1090
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.21	7.27	7.49	7.38
Total Suspended Solids	mg/L	-	50	3	31.6	44.4	17.4	11.6
Total Dissolved Solids	mg/L	-	-	1	1240	1230	1310	1490
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	275	305	334	364
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	275	305	334	364
Ammonia, Total (as N)	mg/L	0.75	-	0.005	***6.72***	***4.89***	***4.43***	***5.77***
Bromide (Br)	mg/L	-	-	0.05	<0.50	<0.50	<0.50	<0.50
Chloride (Cl)	mg/L	120	-	0.5	<5.0	<5.0	<5.0	<5.0
Fluoride (F)	mg/L	0.12	-	0.02	<0.20	<0.20	<0.20	<0.20
Nitrate (as N)	mg/L	13	-	0.005	0.98	0.916	0.41	0.883
Nitrite (as N)	mg/L	0.06	-	0.001	0.025	0.016	0.013	0.022
Sulfate (SO4)	mg/L	-	-	0.5	675	652	713	806
Anion Sum	meq/L	-	-	-	19.6	19.7	21.5	24.1
Cation Sum	meq/L	-	-	-	21.3	20.7	21.7	24.9
Cation - Anion Balance	%	-	-	-	4	2.3	0.4	1.6
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	0.008	<0.10	<0.10	<0.10
Cyanide, Total	mg/L	-	0.3	0.005	0.0305	0.14	0.1	0.12
Cyanate	mg/L	-	-	0.2	0.33	2.73	2.85	0.42
Thiocyanate (SCN)	mg/L	-	-	0.5	6.43	5.72	3.9	5.76
Aluminum (Al)-Total	mg/L	0.1	-	0.003	0.0176	0.026	0.0575	0.0108
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.00049	0.00043	0.00036	0.00047
Arsenic (As)-Total	mg/L	0.005	-	0.0001	***0.0551***	***0.0845***	***0.0503***	***0.0101***
Barium (Ba)-Total	mg/L	-	1.0	0.00005	0.0722	0.0667	0.0826	0.0656
Beryllium (Be)-Total	mg/L	-	-	0.00002	<0.000020	<0.000020	<0.000020	<0.000040
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.000050	<0.000050	<0.000050	<0.00010
Boron (B)-Total	mg/L	-	-	0.01	0.059	0.05	0.045	0.06
Cadmium (Cd)-Total ***(Lab Result)***	mg/L	0.00009	0.02	0.00001	***0.000385***	***0.000387***	***0.000151***	***0.000387***
Cadmium (Cd)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.00037*	*0.00037*	*0.00037*	*0.00037*
Calcium (Ca)-Total	mg/L	-	-	0.05	260	267	276	329
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	0.00066	0.00063	0.00046	0.00048
Cobalt (Co)-Total	mg/L	-	-	0.0001	0.00968	0.00787	0.00656	0.0101
Copper (Cu)-Total ***(Lab Result)***	mg/L	0.002	0.2	0.0005	***0.00293***	***0.00321***	0.00193	***0.0022***
Copper (Cu)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.0040*	*0.0040*	*0.0040*	*0.0040*
Iron (Fe)-Total	mg/L	0.3	1	0.01	***16.3***	***17.5***	***5.63***	***4.99***
Lead (Pb)-Total ***(Lab Result)***	mg/L	0.001	0.1	0.00005	<0.000050	0.000091	0.000095	<0.00010
Lead (Pb)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00005*	*0.00700*	*0.00700*	*0.00700*	*0.00700*
Lithium (Li)-Total	mg/L	-	-	0.0005	<0.0010	0.0017	0.0022	0.0022
Magnesium (Mg)-Total	mg/L	-	-	0.1	56.3	56.3	69.7	72.7
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	***7.27***	***6.47***	***6.22***	***7.86***
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	<0.0000050	0.0000064	<0.0000050	<0.0000050
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	0.000992	0.00106	0.000918	0.00113
Nickel (Ni)-Total ***(Lab Result)***	mg/L	0.025	0.3	0.0005	0.00357	0.00309	0.00257	0.0041
Nickel (Ni)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.1500*	*0.1500*	*0.1500*	*0.1500*
Phosphorus (P)-Total	mg/L	-	-	0.05	<0.050	<0.050	0.054	<0.10
Potassium (K)-Total	mg/L	-	-	0.1	7.16	6.3	6.59	8.06
Selenium (Se)-Total	mg/L	0.001	-	0.0001	0.000348	0.000312	0.000235	0.00033
Silicon (Si)-Total	mg/L	-	-	0.05	8.45	8.51	8.74	9.71
Silver (Ag)-Total	mg/L	0.00025	0.1	0.00001	0.00002	0.000029	0.000016	<0.000020
Sodium (Na)-Total	mg/L	-	-	0.05	45.1	36.7	35.9	46.9
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.759	0.774	0.84	0.953
Sulfur (S)-Total	mg/L	-	-	0.5	255	244	259	311
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000020
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00020
Titanium (Ti)-Total	mg/L	-	-	0.0003	0.00124	0.00142	0.00371	0.00092
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.00184	0.00186	0.00163	0.00238
Vanadium (V)-Total	mg/L	-	-	0.0005	0.00234	0.00307	0.00155	0.0013
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	0.0234	***0.0366***	0.0144	***0.0375***
Zirconium (Zr)-Total	mg/L	-	-	0.0003	0.00073	0.0008	0.00044	0.0006

Summary of Water Quality Results for the November 17 and 28, 2016 Trips.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1859859-1 WQ-SEEP 17/11/2016 08:30	L1864060-1 WQ-SEEP 28/11/2016 13:00	L1864060-2 WQ-DC-U 28/11/2016 11:50	L1864060-3 WQ-DC-DSS 28/11/2016 12:10
Aluminum (Al)-Dissolved	mg/L	0.1	-	0.001	0.012	0.0123	0.0093	0.0086
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	0.00049	0.0004	0.00032	0.00044
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	***0.0486***	***0.0683***	***0.0472***	***0.00885***
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0734	0.0625	0.084	0.0627
Beryllium (Be)-Dissolved	mg/L	-	-	0.00002	<0.000020	<0.000020	<0.000020	<0.000040
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.000050	<0.000050	<0.000050	<0.00010
Boron (B)-Dissolved	mg/L	-	-	0.01	0.056	0.046	0.042	0.055
Cadmium (Cd)-Dissolved *(Lab Result)*	mg/L	0.00009	-	0.00001	***0.000346***	***0.000315***	***0.000128***	***0.000343***
Cadmium (Cd)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.00037*	*0.00037*	*0.00037*	*0.00037*
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	257	261	271	321
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	0.00058	0.00044	0.00024	0.00038
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	0.00966	0.00744	0.00633	0.0093
Copper (Cu)-Dissolved *(Lab Result)*	mg/L	0.002	-	0.0002	0.00195	0.00132	0.00155	0.00172
Copper (Cu)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.002*	*0.004*	*0.004*	*0.004*	*0.004*
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	***15.4***	***15***	***4.93***	***4.32***
Lead (Pb)-Dissolved *(Lab Result)*	mg/L	0.001	-	0.00005	<0.000050	<0.000050	<0.000050	<0.00010
Lead (Pb)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00005*	*0.00700*	*0.00700*	*0.00700*	*0.00700*
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	<0.0010	0.0015	0.0015	<0.0020
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	56.6	55.3	69.4	70.2
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	7.48	6.3	6.15	7.58
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum (Mo)-Dissolved	mg/L	0.0073	-	0.00005	0.000938	0.000982	0.000838	0.00104
Nickel (Ni)-Dissolved *(Lab Result)*	mg/L	0.025	-	0.0005	0.00358	0.00298	0.00242	0.0038
Nickel (Ni)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.1500*	*0.1500*	*0.1500*	*0.1500*
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.10
Potassium (K)-Dissolved	mg/L	-	-	0.1	7.48	6.27	6.63	8.01
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	0.000399	0.000319	0.000246	0.00035
Silicon (Si)-Dissolved	mg/L	-	-	0.05	8.27	7.96	8.38	9.15
Silver (Ag)-Dissolved	mg/L	0.00025	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000020
Sodium (Na)-Dissolved	mg/L	-	-	0.05	46.4	35.9	35.5	45.7
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.753	0.756	0.823	0.926
Sulfur (S)-Dissolved	mg/L	-	-	0.5	247	223	245	286
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000020
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00020
Titanium (Ti)-Dissolved	mg/L	-	-	0.0003	0.00093	0.00118	0.00072	0.00068
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.00168	0.00174	0.00154	0.00231
Vanadium (V)-Dissolved	mg/L	-	-	0.001	0.00203	0.00236	0.00109	<0.0010
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	0.0236	***0.034***	0.0139	***0.0347***
Zirconium (Zr)-Dissolved	mg/L	-	-	0.0003	0.00071	0.00074	0.00044	<0.00060

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

Notes:

COLOUR KEY:

Exceeds CCME Guideline

Exceeds MN Effluent Discharge Standards

Exceeds both CCME and MN Standards

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

ATTACHMENT 6: 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: 09-NOV-16
Report Date: 05-DEC-16 15:58 (MT)
Version: FINAL REV. 2

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1856464

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

Comments: ADDITIONAL 29-NOV-16 15:03

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

Can Dang
Senior Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

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

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

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

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

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

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

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

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

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

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

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

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

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

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

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

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

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

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

Reference Information

QC Samples with Qualifiers & Comments:

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

Reference Information

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

Qualifiers for Individual Parameters Listed:

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

Test Method References:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Reference Information

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

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

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

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

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

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

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

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

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

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

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

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

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

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

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

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

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

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

IONBALANCE-VA	Water	Ion Balance Calculation	APHA 1030E

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

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

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

MET-D-CCMS-VA	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)

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

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

MET-T-CCMS-VA	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

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

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

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

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

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

Reference Information

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

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

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

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

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

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

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

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

Whitehorse Receive

al

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L1856464-COFC

COC Number: 14 -

Page 1 of 3

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

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Quality Control (QC) Report with Report ☐ Yes ☐ No

☐ Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: ldoetzel@edynamics.com

Email 2: Emilie.Hamm@gov.yk.ca

Email 3: erik.pit@gov.yk.ca

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

R ☑ Regular (Standard TAT if received by 3 pm - business days)

P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT

E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT

E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge

Specify Date Required for E2,E or P:

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

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: sjenner@edynamics.com

Email 2: ldoetzel@edynamics.com

Project Information

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

Oil and Gas Required Fields (client use)

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

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

ALS Contact: Craig Flaherty **Sampler:**

Analysis Request

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA,EC-PCT-VA,PH-PCT-VA	ANIONS-ALL-IC-WR,TSS-MAN-WR	CN-WAD-CFA-VA,CN-T-CFA-VA	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-DC-U	07-Nov-16	15:50	Water	R	R	R	R	R	R	R	R	R						9
[redacted]	WQ-VC-U	08-Nov-16	13:30	Water	R	R	R	R	R	R	R	R	R						9
[redacted]	WQ-DX+105	08-Nov-16	16:30	Water	R	R	R	R	R	R	R	R	R						9
[redacted]	WQ-DC-B	08-Nov-16	08:50	Water	R	R	R	R	R	R	R	R	R						9
[redacted]	WQ-DX+105-r	08-Nov-16	16:45	Water	R	R	R	R	R	R	R	R	R						9
[redacted]	WQ-VC-DBC	08-Nov-16	13:05	Water	R	R	R	R	R	R	R	R	R						9
[redacted]	WQ-DC-R	07-Nov-16	15:20	Water	R	R	R	R	R	R	R	R	R						9
[redacted]	TRAVEL BLANK	20 July 16	/	water															7

Short Holding Time

Rush Processing

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

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

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

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

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

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C | FINAL COOLER TEMPERATURES °C

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

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

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

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1856464-COFC

COC Number: 14 -

Page 2 of 3

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

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

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

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA,EC-PCT-VA,PH-PCT-VA	ANIONS-ALL-IC-WR,TSS-MAN-WR	CN-WAD-CFA-VA,CN-T-CFA-VA	CN-CNO-WT	CN-SCN-VA	NH3-F-VA	MET-T-BCMDG-VA	MET-D-BCMDG-VA	IONBALANC-VA,TDS-CALC-VA					Number of Containers
							P	P	P	P	P	F/P						
[redacted]	WQ - TP	07-Nov-16	17:55	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ - DC - U - T	07-Nov-16	16:00	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ - VC - UMN	08-Nov-16	10:25	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ - VC - R+150	07-Nov-16	13:55	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ - SEEP	07-Nov-16	17:30	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ - Field BLANK	09-Nov-16	09:45	Water	R	R	R	R	R	R	R	R	R					9
[redacted]		-Nov-16		Water	R	R	R	R	R	R	R	R	R					9

Short Holding Time

Rush Processing

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

SAMPLE CONDITION AS RECEIVED (lab use only)

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

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

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

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1856464-COFC

COC Number: 14 -

Page 3 of 3

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

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	FULL-TOT-DW-WR	Number of Containers
[redacted]	WQ-PW	09 - Nov-16	09:45	Water	R	3

Short Holding Time

Rush Processing

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

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

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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

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

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

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

Date Received: 18-NOV-16
Report Date: 25-NOV-16 13:16 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1859859

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

Comments: LC50 Rainbow Trout analysis was performed by Nautilus Environmental located in Burnaby, BC. Refer to their report, appended, for detail.

Can Dang
Senior Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1859859-1				
	Description	Water				
	Sampled Date	16-NOV-16				
	Sampled Time	08:30				
	Client ID	WQ-SEEP				
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	1540				
	Hardness (as CaCO3) (mg/L)	874				
	pH (pH)	7.21				
	Total Suspended Solids (mg/L)	31.6				
	TDS (Calculated) (mg/L)	1240				
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	275				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0				
	Alkalinity, Total (as CaCO3) (mg/L)	275				
	Ammonia, Total (as N) (mg/L)	6.72				
	Bromide (Br) (mg/L)	<0.50 DLDS				
	Chloride (Cl) (mg/L)	<5.0 DLDS				
	Fluoride (F) (mg/L)	<0.20 DLDS				
	Nitrate (as N) (mg/L)	0.980				
	Nitrite (as N) (mg/L)	0.025				
	Sulfate (SO4) (mg/L)	675				
	Anion Sum (meq/L)	19.6				
	Cation Sum (meq/L)	21.3				
	Cation - Anion Balance (%)	4.0				
Cyanides	Cyanide, Weak Acid Diss (mg/L)	0.0080				
	Cyanide, Total (mg/L)	0.0305				
	Cyanate (mg/L)	0.33				
	Thiocyanate (SCN) (mg/L)	6.43				
Total Metals	Aluminum (Al)-Total (mg/L)	0.0176				
	Antimony (Sb)-Total (mg/L)	0.00049				
	Arsenic (As)-Total (mg/L)	0.0551				
	Barium (Ba)-Total (mg/L)	0.0722				
	Beryllium (Be)-Total (mg/L)	<0.000020				
	Bismuth (Bi)-Total (mg/L)	<0.000050				
	Boron (B)-Total (mg/L)	0.059				
	Cadmium (Cd)-Total (mg/L)	0.000385				
	Calcium (Ca)-Total (mg/L)	260				
	Chromium (Cr)-Total (mg/L)	0.00066				
	Cobalt (Co)-Total (mg/L)	0.00968				
	Copper (Cu)-Total (mg/L)	0.00293				
	Iron (Fe)-Total (mg/L)	16.3				
	Lead (Pb)-Total (mg/L)	<0.000050				

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1859859-1				
	Description	Water				
	Sampled Date	16-NOV-16				
	Sampled Time	08:30				
	Client ID	WQ-SEEP				
Grouping	**Analyte**					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0010				
	Magnesium (Mg)-Total (mg/L)	56.3				
	Manganese (Mn)-Total (mg/L)	7.27				
	Mercury (Hg)-Total (mg/L)	<0.0000050				
	Molybdenum (Mo)-Total (mg/L)	0.000992				
	Nickel (Ni)-Total (mg/L)	0.00357				
	Phosphorus (P)-Total (mg/L)	<0.050				
	Potassium (K)-Total (mg/L)	7.16				
	Selenium (Se)-Total (mg/L)	0.000348				
	Silicon (Si)-Total (mg/L)	8.45				
	Silver (Ag)-Total (mg/L)	0.000020				
	Sodium (Na)-Total (mg/L)	45.1				
	Strontium (Sr)-Total (mg/L)	0.759				
	Sulfur (S)-Total (mg/L)	255				
	Thallium (Tl)-Total (mg/L)	<0.000010				
	Tin (Sn)-Total (mg/L)	<0.00010				
	Titanium (Ti)-Total (mg/L)	0.00124				
	Uranium (U)-Total (mg/L)	0.00184				
	Vanadium (V)-Total (mg/L)	0.00234				
	Zinc (Zn)-Total (mg/L)	0.0234				
	Zirconium (Zr)-Total (mg/L)	0.00073				
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD				
	Dissolved Metals Filtration Location	FIELD				
	Aluminum (Al)-Dissolved (mg/L)	0.0120				
	Antimony (Sb)-Dissolved (mg/L)	0.00049				
	Arsenic (As)-Dissolved (mg/L)	0.0486				
	Barium (Ba)-Dissolved (mg/L)	0.0734				
	Beryllium (Be)-Dissolved (mg/L)	<0.000020				
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050				
	Boron (B)-Dissolved (mg/L)	0.056				
	Cadmium (Cd)-Dissolved (mg/L)	0.000346				
	Calcium (Ca)-Dissolved (mg/L)	257				
	Chromium (Cr)-Dissolved (mg/L)	0.00058				
	Cobalt (Co)-Dissolved (mg/L)	0.00966				
	Copper (Cu)-Dissolved (mg/L)	0.00195				
	Iron (Fe)-Dissolved (mg/L)	15.4				
	Lead (Pb)-Dissolved (mg/L)	<0.000050				

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1859859-1				
	Description	Water				
	Sampled Date	16-NOV-16				
	Sampled Time	08:30				
	Client ID	WQ-SEEP				
Grouping	**Analyte**					
WATER						
Dissolved Metals	Lithium (Li)-Dissolved (mg/L)	<0.0010				
	Magnesium (Mg)-Dissolved (mg/L)	56.6				
	Manganese (Mn)-Dissolved (mg/L)	7.48				
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050				
	Molybdenum (Mo)-Dissolved (mg/L)	0.000938				
	Nickel (Ni)-Dissolved (mg/L)	0.00358				
	Phosphorus (P)-Dissolved (mg/L)	<0.050				
	Potassium (K)-Dissolved (mg/L)	7.48				
	Selenium (Se)-Dissolved (mg/L)	0.000399				
	Silicon (Si)-Dissolved (mg/L)	8.27				
	Silver (Ag)-Dissolved (mg/L)	<0.000010				
	Sodium (Na)-Dissolved (mg/L)	46.4				
	Strontium (Sr)-Dissolved (mg/L)	0.753				
	Sulfur (S)-Dissolved (mg/L)	247				
	Thallium (Tl)-Dissolved (mg/L)	<0.000010				
	Tin (Sn)-Dissolved (mg/L)	<0.00010				
	Titanium (Ti)-Dissolved (mg/L)	0.00093				
	Uranium (U)-Dissolved (mg/L)	0.00168				
	Vanadium (V)-Dissolved (mg/L)	0.00203				
	Zinc (Zn)-Dissolved (mg/L)	0.0236				
	Zirconium (Zr)-Dissolved (mg/L)	0.00071				

* 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	L1859859-1
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1859859-1
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1859859-1
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1859859-1
Matrix Spike	Boron (B)-Dissolved	MS-B	L1859859-1
Matrix Spike	Cadmium (Cd)-Dissolved	MS-B	L1859859-1
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1859859-1
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1859859-1
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1859859-1
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1859859-1
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1859859-1
Matrix Spike	Cobalt (Co)-Dissolved	MS-B	L1859859-1
Matrix Spike	Iron (Fe)-Dissolved	MS-B	L1859859-1
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1859859-1
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1859859-1
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1859859-1
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1859859-1
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1859859-1
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1859859-1
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1859859-1
Matrix Spike	Nickel (Ni)-Dissolved	MS-B	L1859859-1
Matrix Spike	Potassium (K)-Dissolved	MS-B	L1859859-1
Matrix Spike	Potassium (K)-Dissolved	MS-B	L1859859-1
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1859859-1
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1859859-1
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1859859-1
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1859859-1
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1859859-1
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1859859-1
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1859859-1
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L1859859-1
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L1859859-1
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L1859859-1
Matrix Spike	Uranium (U)-Dissolved	MS-B	L1859859-1
Matrix Spike	Zinc (Zn)-Dissolved	MS-B	L1859859-1

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
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.

Reference Information

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

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

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

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

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

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

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

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

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

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-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

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

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

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

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

Reference Information

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.

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

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

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

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

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

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

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

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

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

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

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

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

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:

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.

NAUTILUS ENVIRONMENTAL

Acute Toxicity Test Results

Sample collected November 16, 2016

Final Report

November 25, 2016

Submitted to: **ALS Environmental**
Burnaby, BC

8664 Commerce Court, Burnaby, BC V5A 4N7

SAMPLE INFORMATION

Sample ID	Dates			Receipt temperature
	Collected	Received	Rainbow trout test initiation	
L1859859-1 WQ-SEEP	15-Nov-16 at N/A	18-Nov-16 at 1445h	19-Nov-16 at 1130h	2.7°C

N/A = Not Available.

TESTS

- Rainbow trout 96-h LC50 test

RESULTS

Toxicity test results

Sample ID	96-h LC50 (% v/v)
L1859859-1 WQ-SEEP	>100

QA/QC

QA/QC summary	Rainbow trout
Reference toxicant LC50 (95% CI)	40.6 (34.1 – 48.4) µg/L Zn[1]
Reference toxicant historical mean (2 SD range)	60.8 (22.0 – 167.6) µg/L Zn
Reference toxicant CV	66%
Organism health history	Acceptable
Protocol deviations	None
Water quality range deviations	None
Control performance	Acceptable
Test performance	Valid

[1] Test date: November 14, 2016

Report By:
Yvonne Lam, B.Sc.
Laboratory Biologist

Reviewed By:
Edmund Canaria, R.P.Bio
Senior Analyst

This report has been prepared by Nautilus Environmental Company Inc. based on data and/or samples provided by our client and the results of this study are for their sole benefit. Any reliance on the data by a third party is at the sole and exclusive risk of that party. The results presented here relate only to the samples tested.

APPENDIX A – **Summary of test conditions**

Table 1. Summary of test conditions: 96-h rainbow trout (*Oncorhynchus mykiss*) LC50 test.

Test species	*Oncorhynchus mykiss*
Organism source	Hatchery
Organism age	Juvenile
Test type	Static
Test duration	96 hours
Test vessel	20-L glass aquarium
Test volume	10 to 20 L (depending on size of fish)
Test solution depth	≥15 cm
Test concentrations	Five concentrations, plus laboratory control
Test replicates	1 per treatment
Number of organisms	10 per replicate
Control/dilution water	Dechlorinated Metro Vancouver municipal tapwater
Test solution renewal	None
Test temperature	15 ± 1°C
Feeding	None
Light intensity	100 to 500 lux
Photoperiod	16 hours light / 8 hours dark
Aeration	6.5 ± 1 mL/min/L
Test measurements	Temperature, dissolved oxygen and pH measured daily; salinity measured in the undiluted sample at test initiation; conductivity measured at test initiation and termination; survival checked daily
Test protocol	Environment Canada (2000), EPS 1/RM/13, with 2007 & 2016 amendments
Statistical software	CETIS Version 1.8.7
Test endpoints	Survival (96-hour LC50)
Test acceptability criterion for controls	Survival ≥90%
Reference toxicant	Zinc (added as $ZnCl_2$)

APPENDIX B – **Toxicity test data**

Rainbow Trout Summary Sheet

Client: ALS

Start Date/Time: Nov 19 /16 @ 1130h

Work Order No.: 161267

Test Species: *Oncorhynchus mykiss*

Test Validity Criteria:
≥ 90% control survival
WQ Ranges:
T (°C) = 15 ± 1; DO (mg/L) = 7.0 to 10.3; pH = 5.5 to 8.5

Sample Information:

Sample ID: L1859859-1 WQ-SEEP
Sample Date: Nov 16 /16
Date Received: Nov 18 /16
Sample Volume: 2 X 20L
Other: /

Dilution Water:

Type: Dechlorinated Municipal Tap Water
Hardness (mg/L $CaCO_3$): 8
Alkalinity (mg/L $CaCO_3$): 4

Test Organism Information:

Batch No.: 110116
Source: Vancouver Island Trout Hatchery
No. Fish/Volume (L): 10/10L
Loading Density (g/L): 0.30
Mean Length ± SD (mm): 29 ± 1 Range: 27-31
Mean Weight ± SD (g): 0.30 ± 0.05 Range: 0.22-0.39

Zinc Reference Toxicant Results:

Reference Toxicant ID: RTZn54
Stock Solution ID: 16Zn02
Date Initiated: NOV14/16
96-h LC50 (95% CL): 48.6 (34.1-48.4) mg/L

Reference Toxicant Mean and Historical Range: 60.8 (22.0-167.6) mg/L Zn
Reference Toxicant CV (%): 66.1 %

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

Reviewed by: [signature] Date reviewed: NOV. 24, 2016

96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: ALS
Sample I.D. L1859859 - 1-WQ-SEEP
W.O. # 161267
RBT Batch #: 110116
Date Collected/Time: Nov 10/16 @ N/A
Date Setup/Time: Nov 10/16 @ 1130 h
Sample Setup By: AMo

Number Fish/Volume: 10/10L
7-d % Mortality: 0
Total Pre-aeration Time (mins): 30
Aeration rate adjusted to 6.5 ± 1 mL/min/L? (Y/N): Yes

Thermometer: Temp-2 **D.O. meter:** DO-2
Cond./Salinity: C-2 **pH meter:** pH-1

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	14.0		14.0
D.O. (mg/L)	~~7.~~ 6.8		7.5
pH	6.6		6.7
Cond. (µS/cm)	1588		1591
Salinity (ppt)	0.8		0.8

Concentration	# Survivors							Temperature (°C)					Dissolved Oxygen (mg/L)					pH					Conductivity (µS/cm)	
(% v/v)	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96
Control				10	10	10	10	14.0	14.0	15.0	15.0	15.0	10.2	9.8	10.0	9.8	9.8	6.9	7.1	7.0	7.0	7.0	26	43
6.25				10	10	10	10	14.0	14.0	15.0	15.0	15.0	10.2	9.7	9.9	9.9	9.8	6.9	7.4	7.5	7.5	7.3	147	149
12.5				10	10	10	10	14.0	14.0	15.0	15.0	15.0	10.1	9.8	9.9	9.9	9.9	6.8	7.5	7.6	7.6	7.5	300	308
25				10	10	10	10	14.0	14.0	15.0	15.0	15.0	10.1	9.8	9.8	9.8	9.9	6.8	7.9	7.8	7.7	7.7	449	450
50				10	10	10	10	14.0	14.0	15.0	15.0	15.0	8.9	9.8	9.9	9.9	9.9	6.7	8.1	8.1	8.0	8.1	597	882
100				8	8	8	7	14.0	14.0	15.0	15.0	15.0	7.5	9.7	9.9	9.9	9.9	6.7	8.3	8.4	8.3	8.4	1591	1531
Initials				AP	EL	EL	EL	AP	AP	EL	EL	EL	AP	AP	EL	EL	EL	AP	AP	EL	EL	EL	AP	EL

Sample Description/Comments: orange - opaque - odourless - no particulates

Fish Description at 96 h: All surviving fish appear normal Number of Stressed Fish at 96 h: 0

Other Observations:

Reviewed by: [signature] Date Reviewed: Nov. 24, 2016

APPENDIX C – **Chain-of-custody form**

ALS Environmental

Rush

L1859859

VANCOUVER

Subcontract Request Form

Subcontract To:

NAUTILUS ENVIRONMENTAL
8664 COMMERCE COURT
BURNABY,BC V5A 4N7

NOTES: Please reference on final report and invoice: PO# *L1859859*
ALS requires QC data to be provided with your final results.

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

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
L1859859-1 WQ-SEEP	Trout Bioassay LC50 (96 Hour) - Nautilus (TROUT-LC50-96HR-NL 1)	11/16/2016 / 11/25/2016	P

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

Analysis and reporting info contact: Shane Ramos
8081 LOUGHEED HWY
SUITE 100
BURNABY,BC V5A 1W9
Phone: (604) 253-4188 Email: Shane.Ramos@ALSGlobal.com

Please email confirmation of receipt to: **Shane.Ramos@ALSGlobal.com**

Shipped By: _____ Date Shipped: _____

Received By: Nautilus Date Received: _____

Verified By: N.Y. Nan Yamamoto Date Verified: Nov 18/16 @ 14:45

Temperature: 2.7°C

Sample Integrity Issues: 2x20L

WO # 161267 - Rbt LC50

END OF REPORT

Whitehorse Receive

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1859859-COFC

COC Number: 14 -

Page 1 of 2

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

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

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

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

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA,EC-PCT-VA,PH-PCT-VA	ANIONS-ALL-IC-WR,TSS-MAN-WR	CN-WAD-CFA-VA,CN-T-CFA -VA	CN-CNO-WT	CN-SCN-VA	NH3-F-VA	MET-T-BCMDG-VA	MET-D-BCMDG-VA	IONBALANC-VA, TDS-CALC-VA					Number of Containers
							P	P	P	P	P	F/P						
[redacted]	WQ-SEEP	16-Nov-16	08:30	Water	R	R	R	R	R	R	R	R	R					9

RUSH

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

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
4.6			2	3.2	5

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]	17/11/16	1305	[redacted]	17-11-16	1:10	JC	NOV 18 2016	11:25AM

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-03256 v09 Front/04 January 2014

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

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

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1859859-COFC

COC Number: 14 -

Page 1 of 2

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	erik.pit@gov.yk.ca	
		Email 3	Emilie.Hamm@gov.yk.ca	

Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution		Analysis Request
	Copy of Invoice with Report ☑ Yes ☐ No	Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
Company:	EDI	Email 1 or Fax	sjenner@edynamics.com	
Contact:	S Jenner	Email 2	ldoetzel@edynamics.com	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q55559	Approver ID:	Cost Center:
Job #:	MOUNT NANSEN 16Y0089	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): [redacted] | ALS Contact: Sean Sluggett | Sampler:

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Rainbow Trout LC50	Number of Containers
[redacted]	WQ-SEEP	16-Nov-16	08:30	Water	R	2

RUSH

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
5.6				1°C	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
[signature]	17/11/16	13:05	[signature]	Nov 17 16	1:10	JC	18Nov16	11:25 Am

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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

Date Received: 18-NOV-16
Report Date: 22-NOV-16 18:05 (MT)
Version: DRAFT

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1859859

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

Can Dang
Senior Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1859859-1				
	Description	Water				
	Sampled Date	16-NOV-16				
	Sampled Time	08:30				
	Client ID	WQ-SEEP				
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	1540				
	Hardness (as CaCO3) (mg/L)	874				
	pH (pH)	7.21				
	Total Suspended Solids (mg/L)	31.6				
	TDS (Calculated) (mg/L)	1240				
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	275				
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0				
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0				
	Alkalinity, Total (as CaCO3) (mg/L)	275				
	Ammonia, Total (as N) (mg/L)	6.72				
	Bromide (Br) (mg/L)	<0.50 DLDS				
	Chloride (Cl) (mg/L)	<5.0 DLDS				
	Fluoride (F) (mg/L)	<0.20 DLDS				
	Nitrate (as N) (mg/L)	0.980				
	Nitrite (as N) (mg/L)	0.025				
	Sulfate (SO4) (mg/L)	675				
	Anion Sum (meq/L)	19.6				
	Cation Sum (meq/L)	21.3				
	Cation - Anion Balance (%)	4.0				
Cyanides	Cyanide, Weak Acid Diss (mg/L)	0.0080				
	Cyanide, Total (mg/L)	0.0305				
	Cyanate (mg/L)	0.33				
	Thiocyanate (SCN) (mg/L)	6.43				
Total Metals	Aluminum (Al)-Total (mg/L)	0.0176				
	Antimony (Sb)-Total (mg/L)	0.00049				
	Arsenic (As)-Total (mg/L)	0.0551				
	Barium (Ba)-Total (mg/L)	0.0722				
	Beryllium (Be)-Total (mg/L)	<0.000020				
	Bismuth (Bi)-Total (mg/L)	<0.000050				
	Boron (B)-Total (mg/L)	0.059				
	Cadmium (Cd)-Total (mg/L)	0.000385				
	Calcium (Ca)-Total (mg/L)	260				
	Chromium (Cr)-Total (mg/L)	0.00066				
	Cobalt (Co)-Total (mg/L)	0.00968				
	Copper (Cu)-Total (mg/L)	0.00293				
	Iron (Fe)-Total (mg/L)	16.3				
	Lead (Pb)-Total (mg/L)	<0.000050				

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1859859-1				
	Description	Water				
	Sampled Date	16-NOV-16				
	Sampled Time	08:30				
	Client ID	WQ-SEEP				
Grouping	**Analyte**					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	<0.0010				
	Magnesium (Mg)-Total (mg/L)	56.3				
	Manganese (Mn)-Total (mg/L)	7.27				
	Mercury (Hg)-Total (mg/L)	<0.0000050				
	Molybdenum (Mo)-Total (mg/L)	0.000992				
	Nickel (Ni)-Total (mg/L)	0.00357				
	Phosphorus (P)-Total (mg/L)	<0.050				
	Potassium (K)-Total (mg/L)	7.16				
	Selenium (Se)-Total (mg/L)	0.000348				
	Silicon (Si)-Total (mg/L)	8.45				
	Silver (Ag)-Total (mg/L)	0.000020				
	Sodium (Na)-Total (mg/L)	45.1				
	Strontium (Sr)-Total (mg/L)	0.759				
	Sulfur (S)-Total (mg/L)	255				
	Thallium (Tl)-Total (mg/L)	<0.000010				
	Tin (Sn)-Total (mg/L)	<0.00010				
	Titanium (Ti)-Total (mg/L)	0.00124				
	Uranium (U)-Total (mg/L)	0.00184				
	Vanadium (V)-Total (mg/L)	0.00234				
	Zinc (Zn)-Total (mg/L)	0.0234				
	Zirconium (Zr)-Total (mg/L)	0.00073				
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD				
	Dissolved Metals Filtration Location	FIELD				
	Aluminum (Al)-Dissolved (mg/L)	0.0120				
	Antimony (Sb)-Dissolved (mg/L)	0.00049				
	Arsenic (As)-Dissolved (mg/L)	0.0486				
	Barium (Ba)-Dissolved (mg/L)	0.0734				
	Beryllium (Be)-Dissolved (mg/L)	<0.000020				
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050				
	Boron (B)-Dissolved (mg/L)	0.056				
	Cadmium (Cd)-Dissolved (mg/L)	0.000346				
	Calcium (Ca)-Dissolved (mg/L)	257				
	Chromium (Cr)-Dissolved (mg/L)	0.00058				
	Cobalt (Co)-Dissolved (mg/L)	0.00966				
	Copper (Cu)-Dissolved (mg/L)	0.00195				
	Iron (Fe)-Dissolved (mg/L)	15.4				
	Lead (Pb)-Dissolved (mg/L)	<0.000050				

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1859859-1
	Description	Water
	Sampled Date	16-NOV-16
	Sampled Time	08:30
	Client ID	WQ-SEEP
Grouping	**Analyte**	
WATER		
Dissolved Metals	Lithium (Li)-Dissolved (mg/L)	<0.0010
	Magnesium (Mg)-Dissolved (mg/L)	56.6
	Manganese (Mn)-Dissolved (mg/L)	7.48
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050
	Molybdenum (Mo)-Dissolved (mg/L)	0.000938
	Nickel (Ni)-Dissolved (mg/L)	0.00358
	Phosphorus (P)-Dissolved (mg/L)	<0.050
	Potassium (K)-Dissolved (mg/L)	7.48
	Selenium (Se)-Dissolved (mg/L)	0.000399
	Silicon (Si)-Dissolved (mg/L)	8.27
	Silver (Ag)-Dissolved (mg/L)	<0.000010
	Sodium (Na)-Dissolved (mg/L)	46.4
	Strontium (Sr)-Dissolved (mg/L)	0.753
	Sulfur (S)-Dissolved (mg/L)	247
	Thallium (Tl)-Dissolved (mg/L)	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	0.00093
	Uranium (U)-Dissolved (mg/L)	0.00168
	Vanadium (V)-Dissolved (mg/L)	0.00203
	Zinc (Zn)-Dissolved (mg/L)	0.0236
	Zirconium (Zr)-Dissolved (mg/L)	0.00071

* 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	Barium (Ba)-Dissolved	MS-B	L1859859-1
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1859859-1
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1859859-1
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1859859-1

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
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

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.

Reference Information

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-T-CCMS-VA	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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:

Reference Information

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

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

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

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

Whitehorse Receive

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1859859-COFC

COC Number: 14 -

Page 1 of 2

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

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

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

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

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA,EC-PCT-VA,PH-PCT-VA	ANIONS-ALL-IC-WR,TSS-MAN-WR	CN-WAD-CFA-VA,CN-T-CFA -VA	CN-CNO-WT	CN-SCN-VA	NH3-F-VA	MET-T-BCMDG-VA	MET-D-BCMDG-VA	IONBALANC-VA, TDS-CALC-VA					Number of Containers
							P	P	P	P	P	F/P						
[redacted]	WQ-SEEP	16-Nov-16	08:30	Water	R	R	R	R	R	R	R	R	R					9

RUSH

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

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
4.6			2	3.2	5

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]	17/11/16	1305	[redacted]	17-11-16	1:10	JC	NOV 18 2016	11:25AM

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-03256 v09 Front/04 January 2014

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

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

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1859859-COFC

COC Number: 14 -

Page 1 of 2

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	erik.pit@gov.yk.ca	
		Email 3	Emilie.Hamm@gov.yk.ca	

Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution		Analysis Request
	Copy of Invoice with Report ☑ Yes ☐ No	Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
Company:	EDI	Email 1 or Fax	sjenner@edynamics.com	
Contact:	S Jenner	Email 2	ldoetzel@edynamics.com	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q55559	Approver ID:	Cost Center:
Job #:	MOUNT NANSEN 16Y0089	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): [redacted] | ALS Contact: Sean Sluggett | Sampler:

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Rainbow Trout LC50	Number of Containers
[redacted]	WQ-SEEP	16-Nov-16	08:30	Water	R	2

RUSH

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
5.6				1°C	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
[signature]	17/11/16	13:05	[signature]	Nov 17 16	1:10	JC	18Nov16	11:25 Am

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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

Date Received: 28-NOV-16
Report Date: 02-DEC-16 15:07 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1864060

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

Comments: The total cyanide results found and reported could be bias low due to sample matrix interferences. For the total cyanide analysis, the samples were spiked with a known concentration cyanide standard prior to analysis. The percentage of known cyanide recovered was <75%. This low percentage recovery suggested possible matrix interferences in the measurement of total cyanide.

Can Dang
Senior Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1864060-1	L1864060-2	L1864060-3		
	Description	Water	Water	Water		
	Sampled Date	28-NOV-16	28-NOV-16	28-NOV-16		
	Sampled Time	13:00	11:50	12:10		
	Client ID	WQ-SEEP	WQ-DC-U	WQ-DC-DSS		
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	1610	1690	1930		
	Hardness (as CaCO3) (mg/L)	880	962	1090		
	pH (pH)	7.27	7.49	7.38		
	Total Suspended Solids (mg/L)	44.4	17.4	11.6		
	TDS (Calculated) (mg/L)	1230	1310	1490		
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	305	334	364		
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0		
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0		
	Alkalinity, Total (as CaCO3) (mg/L)	305	334	364		
	Ammonia, Total (as N) (mg/L)	4.89	4.43	5.77		
	Bromide (Br) (mg/L)	<0.50 DLDS	<0.50 DLDS	<0.50 DLDS		
	Chloride (Cl) (mg/L)	<5.0 DLDS	<5.0 DLDS	<5.0 DLDS		
	Fluoride (F) (mg/L)	<0.20	<0.20	<0.20		
	Nitrate (as N) (mg/L)	0.916	0.410	0.883		
	Nitrite (as N) (mg/L)	0.016	0.013	0.022		
	Sulfate (SO4) (mg/L)	652	713	806		
	Anion Sum (meq/L)	19.7	21.5	24.1		
	Cation Sum (meq/L)	20.7	21.7	24.9		
	Cation - Anion Balance (%)	2.3	0.4	1.6		
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.10 DLM	<0.10 DLM	<0.10 DLM		
	Cyanide, Total (mg/L)	0.14 RRR	0.10 RRR	0.12 RRR		
	Cyanate (mg/L)	2.73	2.85	0.42		
	Thiocyanate (SCN) (mg/L)	5.72	3.90	5.76		
Total Metals	Aluminum (Al)-Total (mg/L)	0.0260	0.0575	0.0108		
	Antimony (Sb)-Total (mg/L)	0.00043	0.00036	0.00047		
	Arsenic (As)-Total (mg/L)	0.0845	0.0503	0.0101		
	Barium (Ba)-Total (mg/L)	0.0667	0.0826	0.0656		
	Beryllium (Be)-Total (mg/L)	<0.000020	<0.000020	<0.000040		
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.00010		
	Boron (B)-Total (mg/L)	0.050	0.045	0.060		
	Cadmium (Cd)-Total (mg/L)	0.000387	0.000151	0.000387		
	Calcium (Ca)-Total (mg/L)	267	276	329		
	Chromium (Cr)-Total (mg/L)	0.00063	0.00046	0.00048		
	Cobalt (Co)-Total (mg/L)	0.00787	0.00656	0.0101		
	Copper (Cu)-Total (mg/L)	0.00321	0.00193	0.0022		
	Iron (Fe)-Total (mg/L)	17.5	5.63	4.99		
	Lead (Pb)-Total (mg/L)	0.000091	0.000095	<0.00010		

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1864060-1	L1864060-2	L1864060-3		
	Description	Water	Water	Water		
	Sampled Date	28-NOV-16	28-NOV-16	28-NOV-16		
	Sampled Time	13:00	11:50	12:10		
	Client ID	WQ-SEEP	WQ-DC-U	WQ-DC-DSS		
Grouping	**Analyte**					
WATER						
Total Metals	Lithium (Li)-Total (mg/L)	0.0017	0.0022	0.0022		
	Magnesium (Mg)-Total (mg/L)	56.3	69.7	72.7		
	Manganese (Mn)-Total (mg/L)	6.47	6.22	7.86		
	Mercury (Hg)-Total (mg/L)	0.0000064	<0.0000050	<0.0000050		
	Molybdenum (Mo)-Total (mg/L)	0.00106	0.000918	0.00113		
	Nickel (Ni)-Total (mg/L)	0.00309	0.00257	0.0041		
	Phosphorus (P)-Total (mg/L)	<0.050	0.054	<0.10 DLA		
	Potassium (K)-Total (mg/L)	6.30	6.59	8.06		
	Selenium (Se)-Total (mg/L)	0.000312	0.000235	0.00033		
	Silicon (Si)-Total (mg/L)	8.51	8.74	9.71		
	Silver (Ag)-Total (mg/L)	0.000029	0.000016	<0.000020 DLA		
	Sodium (Na)-Total (mg/L)	36.7	35.9	46.9		
	Strontium (Sr)-Total (mg/L)	0.774	0.840	0.953		
	Sulfur (S)-Total (mg/L)	244	259	311		
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000020 DLA		
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00020 DLA		
	Titanium (Ti)-Total (mg/L)	0.00142	0.00371	0.00092		
	Uranium (U)-Total (mg/L)	0.00186	0.00163	0.00238		
	Vanadium (V)-Total (mg/L)	0.00307	0.00155	0.0013		
	Zinc (Zn)-Total (mg/L)	0.0366	0.0144	0.0375		
	Zirconium (Zr)-Total (mg/L)	0.00080	0.00044	0.00060		
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD		
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD		
	Aluminum (Al)-Dissolved (mg/L)	0.0123	0.0093	0.0086		
	Antimony (Sb)-Dissolved (mg/L)	0.00040	0.00032	0.00044		
	Arsenic (As)-Dissolved (mg/L)	0.0683	0.0472	0.00885		
	Barium (Ba)-Dissolved (mg/L)	0.0625	0.0840	0.0627		
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000040 DLA		
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.00010 DLA		
	Boron (B)-Dissolved (mg/L)	0.046	0.042	0.055		
	Cadmium (Cd)-Dissolved (mg/L)	0.000315	0.000128	0.000343		
	Calcium (Ca)-Dissolved (mg/L)	261	271	321		
	Chromium (Cr)-Dissolved (mg/L)	0.00044	0.00024	0.00038		
	Cobalt (Co)-Dissolved (mg/L)	0.00744	0.00633	0.00930		
	Copper (Cu)-Dissolved (mg/L)	0.00132	0.00155	0.00172		
	Iron (Fe)-Dissolved (mg/L)	15.0	4.93	4.32		
	Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	<0.00010 DLA		

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1864060-1 Water 28-NOV-16 13:00 WQ-SEEP	L1864060-2 Water 28-NOV-16 11:50 WQ-DC-U	L1864060-3 Water 28-NOV-16 12:10 WQ-DC-DSS		
WATER						
Dissolved Metals	Lithium (Li)-Dissolved (mg/L)	0.0015	0.0015	<0.0020 DLA		
	Magnesium (Mg)-Dissolved (mg/L)	55.3	69.4	70.2		
	Manganese (Mn)-Dissolved (mg/L)	6.30	6.15	7.58		
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050	<0.0000050		
	Molybdenum (Mo)-Dissolved (mg/L)	0.000982	0.000838	0.00104		
	Nickel (Ni)-Dissolved (mg/L)	0.00298	0.00242	0.0038		
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.10 DLA		
	Potassium (K)-Dissolved (mg/L)	6.27	6.63	8.01		
	Selenium (Se)-Dissolved (mg/L)	0.000319	0.000246	0.00035		
	Silicon (Si)-Dissolved (mg/L)	7.96	8.38	9.15		
	Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000020 DLA		
	Sodium (Na)-Dissolved (mg/L)	35.9	35.5	45.7		
	Strontium (Sr)-Dissolved (mg/L)	0.756	0.823	0.926		
	Sulfur (S)-Dissolved (mg/L)	223	245	286		
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000020 DLA		
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00020 DLA		
	Titanium (Ti)-Dissolved (mg/L)	0.00118	0.00072	0.00068		
	Uranium (U)-Dissolved (mg/L)	0.00174	0.00154	0.00231		
	Vanadium (V)-Dissolved (mg/L)	0.00236	0.00109	<0.0010 DLA		
	Zinc (Zn)-Dissolved (mg/L)	0.0340	0.0139	0.0347		
	Zirconium (Zr)-Dissolved (mg/L)	0.00074	0.00044	<0.00060 DLA		

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Aluminum (Al)-Total	MB-LOR	L1864060-1, -2, -3
Matrix Spike	Aluminum (Al)-Total	MS-B	L1864060-1, -2, -3
Matrix Spike	Barium (Ba)-Total	MS-B	L1864060-1, -2, -3
Matrix Spike	Calcium (Ca)-Total	MS-B	L1864060-1, -2, -3
Matrix Spike	Iron (Fe)-Total	MS-B	L1864060-1, -2, -3
Matrix Spike	Magnesium (Mg)-Total	MS-B	L1864060-1, -2, -3
Matrix Spike	Manganese (Mn)-Total	MS-B	L1864060-1, -2, -3
Matrix Spike	Potassium (K)-Total	MS-B	L1864060-1, -2, -3
Matrix Spike	Silicon (Si)-Total	MS-B	L1864060-1, -2, -3
Matrix Spike	Sodium (Na)-Total	MS-B	L1864060-1, -2, -3
Matrix Spike	Strontium (Sr)-Total	MS-B	L1864060-1, -2, -3
Matrix Spike	Sulfur (S)-Total	MS-B	L1864060-1, -2, -3
Matrix Spike	Titanium (Ti)-Total	MS-B	L1864060-1, -2, -3
Matrix Spike	Ammonia, Total (as N)	MS-B	L1864060-2, -3
Matrix Spike	Sulfate (SO4)	MS-B	L1864060-1, -2, -3

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
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

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

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

Reference Information

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-T-CCMS-VA Water Total Metals in Water by CRC ICPMS EPA 200.2/6020A (mod)

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

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

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

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

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

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

Reference Information

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

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

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:

GLOSSARY OF REPORT TERMS

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

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

Whitehorse Receive

Chain of Custody (COC) / Analytical Request Form

tal

Canada Toll Free: 1 800 668 9878

L1864060-COFC

COC Number: 14 -

Page 1 of 1

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	EDI	Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☐ Regular (Standard TAT if received by 3 pm - business days)
Contact:	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.plt@gov.yk.ca	

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

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q55559	Approver ID:	Cost Center:
Job #:	MOUNT NANSEN 16-Y-0089	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)	[redacted]	ALS Contact: Craig Flaherty	Sampler:

Analysis Request

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA,EC-PCT-VA,PH-PCT-VA	ANIONS-ALL-IC-WR,TSS-MAN-WR	CN-WAD-CFA-VA,CN-T-CFA -VA	CN-CNO-WT	CN-SCN-VA	NH3-F-VA	MET-T-BCMDG-VA	MET-D-BCMDG-VA	IONBALANC-VA, TDS-CALC-VA	Number of Containers
							P	P	P	P	P	F/P		
[redacted]	WQ-SEEP	28-Nov-2016	13:00	Water	R	R	R	R	R	R	R	R	R	9
[redacted]	~~WQ-DC-U~~	~~28-Nov-16~~			R	R	R	R	R	R	R	R	R	9
[redacted]	WQ-DC-U	28-Nov-16	11:50		R	R	R	R	R	R	R	R	R	9
[redacted]	WQ-DC-DSS	28-Nov-16	12:10		R	R	R	R	R	R	R	R	R	9
[redacted]														
[redacted]														
[redacted]														
[redacted]														
[redacted]														
[redacted]														
[redacted]														

RUSH

Priority processing

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

SAMPLE CONDITION AS RECEIVED (lab use only)

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

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

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]	28/11/16	16:52	[redacted]	28 Nov	4:55PM	[redacted]	Nov 29	4:10pm

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-03256-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*
Phone / *Téléphone*
Mailing address / *Adresse postale*
Fax / *Télécopieur*
Postal code / *Code postal*
First Nation, Municipal or Business Name / *Nom de la Première nation, de la municipalité ou de l'entreprise*
Agent / *Agent*
Fax / *Télécopieur*

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

Municipal Address / *Adresse municipale*
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*
Date / *Date* YY/MM/DD · *AA/MM/JJ*
Time / *Heure* am / pm
Sampling Site (e.g., kitchen tap) / *Point d'échantillonnage (ex. : robinet de cuisine)*
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* YY/MM/DD · *AA/MM/JJ* Time / *Heure* am / pm By / *Par*

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*