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June 28, 2016

EDI Project No: 16Y0089

Assessment and Abandoned Mines Branch (AAM) K-149
Department of Energy, Mines and Resources, Yukon Government
Room 2C Royal Center, 4114-4th Avenue
PO 2703, Whitehorse, YT, Y1A 2C6

Attention: Erik Pit, Type II Project Manager

RE: Mount Nansen Water Resources Investigations – Monthly Report: April 2016

Trip dates:	April 18 - 20, 2016 and April 26 – 28, 2016
EDI field staff:	April 18 - 20, 2016: Scott Dilling, Joel MacFabe and Danny Skookum April 26 – 28, 2016. Scott Dilling, Jane Bachman, Alex Mischler and Danny Skookum
Weather during trip:	April 18 - 20, 2016*:* Conditions ranged from clear skies to light snow with light winds and temperatures up to 8°C. April 26 – 28, 2016*:* Conditions range from clear skies to light snow with calm winds and temperatures up to 11°C.

The following monthly report includes a summary of site conditions and data collected during EDI's April 2016 trips to Mount Nansen as part of the 2016/17 Water Resources Investigations. Two trips were completed in April 2016 to capture the spring freshet period and represent the start of the open water season. In addition to hydrology and meteorology, this report includes site conditions, water quality, program recommendations and additional trip information (Table 1).

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

Report Section	Description
Site Conditions	• Summary of weather and general site conditions
Meteorology	• Statement on station status and identification of any data gaps or QA/QC issues • Snow depth sensor QA/QC
Hydrology	• Discussion of hydrology data for this month • Statement of QA/QC for the data collected this month
Water Quality	• Summary of water quality results for this month • Statement on QA/QC sample results for this month
Program Recommendations	• Program recommendations for meteorological, hydrology and water quality programs

Report Section	Description
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 from the trip 3. April Hydrology Data Tables 4. April Water Quality Data Tables 5. Laboratory Certificates of Analysis (COA) & Yukon Environmental Health Services Bacteriological Results (April 2016).

SITE CONDITIONS

The two site trips in April 2016 were reflective of early-spring conditions and the spring freshet period at the Mount Nansen Site; the majority of snow and ice around the site had melted. Small, isolated patches of snow, frozen ground and overflow ice were present, particularly in shaded areas on north-facing slopes. All watercourses were flowing during the first April trip, April 18-20, 2016 with increased water levels, but snowmelt related peak flows had not been reached. Denison Environmental Services (DES) provided photos and video of site conditions during the week of April 25, 2016 to support scheduling to capture the maximum spring flow. The second April trip began April 26, 2016. A review of the continuous stage data for stations along Victoria Creek and Back Creek indicated that peak flow occurred on the evening of April 25, 2015. Therefore measurements obtained during the second April visit corresponded with declining water levels and discharges. The tailings pond remained covered with ice 0.45 m and 0.25 m thick on the first and second trips, respectively.

METEOROLOGY

Meteorological data was collected at the ATM-ROAD station throughout the month of April 2016. EDI conducted a QA/QC review of the April 2016 data and all sensors appear to be functioning properly. The snow sensor produced a good quality reading during both field visits. On April 19, 2016 the snow depth measured by EDI was 20.5 cm, whereas the snow sensor measurement was 18.8 cm (Table 2). On April 27, 2016, snow was completely melted in the vicinity of the meteorological station; however, the snow sensor reading was 0.8 cm. This measurement error is within acceptable margins of error for the sensor type.

Throughout the winter period, the difference between the field based measurement and snow sensor depth ranged from -0.6 cm to 1.1 cm. The majority of the differences can be accounted for by spatial variability; snow re-distribution due to wind and micro topography in the vicinity of the sensor target and meteorological station. The snow sensor metric called 'Snow_Depth_Qual' reflects the data quality of each measurement (see Note 1, Table 2).

Table 2. Comparison of manual snow depth measurements and snow sensor readings.

Measurement Date/Time	Manual Snow Depth Measurement near Station (cm)	Meteorological Station Snow Sensor Measurement (cm)	Snow Sensor Quality[1]	Difference (cm)
October 13, 2015 13:00	0.0	0.6	181 (Good)	-0.6
November 16, 2015 14:20	20.0	18.2	185 (Good)	1.8
December 15, 2015 18:05	29.1	27.1	182 (Good)	2.0
January 12, 2016 13:35	32.5	30.0	169 (Good)	2.5
February 16, 2016 09:45	41.6	41.3	177 (Good)	0.3
March 15, 2016 09:05	48.0	46.6	172 (Good)	1.4
April 19, 2016 08:40	20.5	18.8	192 (Good)	1.7
April 27, 2016 09:10	0.0	0.8	168 (Good)	-0.8

Note:
[1]- Quality numbers provide an indication of surface density in snow monitoring applications. Values will increase during snowfall events consisting of low-density snow. Quality Numbers: 0 = Not able to read distance; 152-210 = Good Measurement Quality Numbers; 210-300= Reduced Echo Signal Strength; 300-600 = High measurement uncertainty

HYDROLOGY

Discharge measurements were collected at all stations with suitable conditions during the April 2016 trips. Two continuous stations, H-BC and H-DC-R, were re-installed for the open water period. Hydrometric measurements could not be collected at H-DC-D1b during April due to prohibitive ice conditions. While H-VC-R will be discontinued this spring therefore discharge measurements were planned during April to support data analysis and comparisons to the recently established station H-VC-R+290. Hydrometric measurements were obtained at H-VC-R+290, however, measurements could not be obtained at H-VC-R due to overland flow and braided channel conditions caused by ice. Substantial ice and snow melt prior to April allowed for the first measurements of the season at H-DC-DX+105, H-DC-B, H-DC-R, H-BC and H-PC-DSP. Surface water conditions and hydrometric monitoring tasks completed at each station in April 2016 are summarized in Attachment 3. Quality control and quality assurance was conducted for all hydrometric data.

The following seasonal re-installations were completed during the April trips:

- A stilling well, staff gauge and continuous logger were re-established for the open water season at H-BC on April 19, 2016. 2015.
- A stilling well, staff gauge and continuous logger were re-established for the open water season at H-DC-R on April 29, 2016.
- The hydrometric station located at H-VC-R+290 (downstream of H-VC-R) has collected concurrent continuous data with the H-VC-R station since September 2015. H-VC-R+290 station was installed in response to ice accumulations, sediment accumulation and braided

channel conditions affecting the quality of the continuous logger data at H-VC-R. The performance of the stilling well at H-VC-R+290 over the winter period was reviewed and the results indicate that the newer station location was preferable to the H-VC-R throughout the winter period as well as during the spring freshet. The Victoria Creek channel is moderately stable downstream of the Mount Nansen access road, however geomorphic change does occur. The H-VC-R+290 station location will remain a good quality year-round continuous monitoring station if the channel geometry remains stable. The stilling well, staff gauge and continuous logger at H-VC-R will be removed in June 2016.

- Continuous logger records are available at six stations for the month of April: H-DC-M WP, H-VC-U, H-VC-DBC, H-VC-UMN, H-VC-R and H-VC-R+290. For stations re-established in April, only a partial month of continuous data are available. (e.g., H-BC installed April 19, 2015; and H-DC-R installed April 29, 2015).

Summaries of site conditions, hydrometric monitoring tasks completed at each station and discharge measurements for the April 18 – 20, 2016 and April 26 – 28, 2016 periods are provided in the attached data tables. Site observations for the April trips are included in the subsection below. Quality control and quality assurance for the hydrometric data was conducted on both the instantaneous and continuous datasets.

Field Results - April

- Discharge measurements were collected with an ADV using the velocity-area method at the four Victoria Creek stations: H-VC-U, H-VC-DBC, H-VC-UMN and H-VC-R+290. April 18 – 20, 2016 discharge values for Victoria Creek stations ranged from 0.195 to 0.559 m^3/s. Discharge values increased significantly, ranging from 1.367 to 1.754 m^3/s April 26 – 28, 2016 The peak water level associated with snowmelt for these stations occurred on April 25, 2016.
- Hydraulic conditions were suitable for velocity-area measurements at H-BC during April, with measured discharges of 0.074 and 0.179 m^3/s, respectively.
- The discharges measured at H-VC-DBC (0.268 and 1.536 m^3/s) in April were greater than at the downstream station at H-VC-UMN (0.195 and 1.460 m^3/s). Typically discharge increases in the downstream direction of a watercourse as the contributing watershed area increases. As discussed at the end of the 2015/16 winter season, this pattern is suspected to be caused by a net loss to groundwater between the two stations and is most pronounced during the winter season when discharge approaches baseflow.
- Discharge measurements were completed using salt dilution gauging along Dome Creek at H-DC-B, H-DC-M WP and H-DC-R. Discharge ranged from 0.018 to 0.040 m^3/s during the April 18 – 20, 2016 period and increased substantially April 26 – 28, 2016 with flows ranging from 0.046 to 0.055 m^3/s.
- At H-DC-M WP, water continues to leak between the metal weir plate and the wooden support structure. Volumetric measurements cannot be accurately collected due to the leakage; however, salt dilution gauging can be conducted downstream. As previously identified, a large quantity of fine sediment has accumulated in the weir pond. The continuous logger is encased in sediment

and is now outside of the wetted channel. This logger should be removed during the next site visit.

- A preliminary review of the logger at H-DC-M WP data indicates that the timestamps on the logger are functioning properly. Additional off-site testing will be conducted to determine if the pressure transducer is drifting. This will be completed once the logger is removed and will determine if the logger can be re-used elsewhere.
- The H-SEEP volumetric discharge measurement on April 19, 2016 (0.002 m^3/s) was less than the flow rate observed at the pump in the seepage pond shack (0.003 m^3/s). On April 28, 2016, the measured discharge (0.003 m^3/s) was identical to the flow rate observed in the seepage pond pump shack (0.003 m^3/s).

WATER QUALITY

Water quality samples and in-situ data were collected at the regularly scheduled sites during the April 2016 trips. This included sites specifically scheduled for sampling during the spring freshet including opportunistic sampling of seeps along the mill site and waste rock pile. On the April 18 – 20, 2016 period, a total of 19 sites were sampled and remaining sites had no evidence of flow. On the April 26 – 28, 2016 period, a total of 19 sites were sampled and remaining sites had no evidence of flow (Attachment 3). The drinking water sample was collected from the pumphouse well (WQ-PW) on both trips and a bacteriological sample was collected on April 20. All samples were submitted for analysis through ALS Laboratories under chain of custody documentation, except for the bacteriological sample which was submitted to Yukon Government – Health and Social Services for analysis.

Site conditions were noted and a record of the samples collected were compiled (Attachment 3). In-situ and laboratory results summary tables as well as the lab certificates of analysis are attached (Attachment 3 and Attachment 4). 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.

Results reflect typical spring freshet conditions when there is increased surface runoff and sediment introduction with the higher flows from snow and ice melt. This often results in elevated concentrations of many total metals. A summary of the results and comments on the sample QA/QC data are included in the subsections below.

April Water Quality Results Summary

- Back Creek (WQ-BC) April 19 samples exceeded CCME-AL guidelines for aluminum, arsenic, cadmium, copper, iron, lead, mercury and zinc. Total iron also exceeded Mount Nansen EQS. April 27 samples had a higher incidence of total metals concentrations exceeding CCME-AL guidelines (when flows and turbidity were higher) – including aluminum, arsenic, cadmium,

chromium, copper, iron, lead, manganese, mercury, silver and zinc. Total suspended solids, iron and manganese were also above the Mount Nansen EQS.

- All samples from Victoria Creek during the April 19 trip exceeded CCME-AL guideline for total aluminum. Samples from WQ-VC-U, WQ-VC-DBC and WQ-VC-R+150 also exceeded CCME-AL guidelines for total iron and copper. During the April 27 trip there was an increase in the number of total metals concentrations that exceeded CCME-AL guidelines due to increased flows and higher turbidity, including aluminum, arsenic, cadmium, chromium (only WQ-VC-U and WQ-VC-DBC), copper, iron, lead, mercury (only WQ-VC-U, WQ-VC-DBC and WQ-VC-R+150), silver (only WQ-VC-U and WQ-VC-DBC), molybdenum and zinc. Mount Nansen EQS were exceeded for total manganese at WQ-VC-DBC on both trips. All samples also had total suspended solids above the Mount Nansen EQS on the second April trip.
- The upstream (WQ-PC-U) and downstream (WQ-PC-D) Pony Creek sites had samples that exceeded CCME-AL guidelines for aluminum, arsenic, cadmium, copper, iron, lead, mercury (only WQ-PC-D on second trip), silver and zinc. Samples also exceeded Mount Nansen EQS for total iron at each site on both trips, for manganese and zinc only at WQ-PC-D on April 19 and for total suspended solids at WQ-PC-D on April 27.
- The WQ-SEEP samples of both trips exceeded CCME-AL guidelines for ammonia, arsenic, copper, iron and zinc. Total iron and manganese exceeded also Mount Nansen EQS on both trips.
- Tailings Pond (WQ-TP) April 19 samples exceeded the CCME-AL guideline for arsenic, cadmium, copper and zinc. April 28 samples exceeded the CCME-AL guideline for aluminum, arsenic, cadmium, copper, iron, lead, silver and zinc, as well as the Mount Nansen EQS for manganese.
- All samples from Dome Creek exceeded the CCME-AL guidelines for arsenic on both April trips. Samples from WQ-DC-R and WQ-DC-R exceeded Mount Nansen EQS for total iron and manganese on both trips. Samples from WQ-DC-DX+105 exceeded Mount Nansen EQS for zinc.
- Dome East Slope Seep WQ-DESS-01 samples exceeded Mount Nansen EQS for pH and zinc on both April trips. Samples for both WQ-DESS-01 and WQ-DESS-02 exceeded CCME-AL guideline for aluminum and cadmium.
- Diversion Channel (WQ-DC-B) samples exceeded the CCME-AL guidelines for aluminum and arsenic on both April trips, as well as the Mount Nansen EQS for total iron.
- East toe of NW Pile Seep (WQ-NW-SEEP-02) sample from the second April trip exceeded the CCME-AL guidelines for aluminum, arsenic, cadmium, copper, lead, silver and zinc, as well as the Mount Nansen EQS for zinc.
- Both the WQ-ADIT-SEEP and WQ-LW-SEEP-01 were dry during both April 2016 trips.

- The LC50 sample collected from the WQ-SEEP had a 96-hour LC50 result of 100% trout survival at 96-hours. Laboratory added in comments that all fish appeared healthy with no signs of stress at 96 hours.
- The bacteriological sample collected at WQ-PW on April 20, 2016 indicated all coliform bacteria was absent.

QA/QC Samples

April 19-20, 2016 Trip

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 4% with an average difference of 5% for total and 5% for dissolved metals. Only total titanium had RPD>20%.

The average RPD of the replicate sample WQ-VC-U-r was 6% with an average difference of 12% for total and 1% for dissolved metals. Total aluminum, chromium, lead, molybdenum and titanium had RPD>20%.

April 26-28, 2016 Trip

Travel Blank Sample – had an ammonia concentration above detection limit, this can occur when samples provided by lab are dated. All other parameters were below detection limits (no contamination suspected from travel or storage).

Field Blank Sample – had a chromium concentration that was above detection limit, suggestion some potential field contamination (improperly tightened lid, dust or wind during sampling, etc.). All other parameters were below detection limits (no contamination suspected from sample handling or processing).

Replicate Sample(s) – the average RPD of the replicate sample WQ-SEEP-r was 5% with an average difference of 6% for total and 2% for dissolved metals. Total lead, silver and titanium had RPD>20%.

The average RPD of the replicate sample WQ-DC-R-r was 7% with an average difference of 12% for total and 4% for dissolved metals. Total arsenic, cadmium, lead, silver, titanium and zinc had RPD>20%.

PROGRAM RECOMMENDATIONS

- Conduct velocity-area and salt tracer discharge measurements at all hydrometric stations during the open water season, where possible, to continue to validate the salt tracer method.
- As first noted in January 2016, water leaks between the metal weir plate and the wooden structure at H-DC-M WP. Volumetric discharge measurements cannot be made at the station because all of the water cannot be captured. Once flows have receded, the condition of the weir plate should be assessed and repaired as required to facilitate future volumetric discharge measurements.
- Accumulated fine sediment in the weir pond at H-DC-M WP continues to cause concern that channel instability in the diversion channel banks upstream (particularly following rain storms and excavation work) is causing sedimentation in the weir pond, and decreasing the function of the weir and continuous water level logger Sedimentation in the pond decreases capacity, causing water to flow over the edges of the wooden support structure and has buried the continuous water level logger. This station should be converted to a discrete measurement location by removing the logger and periodically removing sediment manually.
- Once removed the water level logger at H-DC-M WP should be tested by EDI for drift and assessed for re-deployment, as required, elsewhere at the Mount Nansen site.
- The hydrometric station at H-VC-R has been collecting concurrent data with H-VC-R+290 since September 2015. The hydrometric station at H-VC-R (stilling well, continuous data logger, staff gauge) is to be removed in June 2016.
- During the 2015 open water season, a large earth dam was constructed upstream of WQ-PC-U as part of placer mining operations. Flows from the ponded area were controlled by a pump that discharged upstream of the WQ-PC-U site. This produced non-representative sampling conditions at WQ-PC-U and WQ-PC-D. Additionally, the accumulation of sediment and the controlling of flows in the channel produced channel instability and non-representative hydrological conditions at H-PC-DSP. Depending on the proposed placer works, the installation of a hydrology station may need to be suspended.
- The benchmarks, stilling well, continuous logger and staff gauge at H-DC-B were removed prior to the winter season to prevent them from being destroyed during excavation activities along the diversion channel. Site conditions during the April trips were not suitable for station installation because of thick ice and snow along the channel. The site will be assessed during the May visit and the station re-established when site conditions permit.

ADDITIONAL TRIP INFORMATION

Any changes to project scope (i.e. additional sites sampled):	None. All sampling and monitoring was conducted within scope. The third sampling trip occurred on May 9 – 11, 2016. A monthly report will be issued after water quality results have been received. The next trip is scheduled for June 6 – 8, 2016. The next trip will be the fourth of the 2016/2017 Water Resources Investigation.
Any alterations to sample schedule/budget:	None. An additional staff member was included on the April 27th trip to cover the additional workload associated with accurately capturing the spring freshet. The budget is able to accommodate this additional staff member.
Additional Comments:	Conditions were representative of spring freshet, with high water levels along many channels, including Victoria Creek. Small patches of snow and overflow ice remain in shaded areas, and moderate amount of ice along the Dome Creek stations.
Wildlife Sightings:	A red fox was spotted along the banks of Diversion Channel on April 19, 2016.
Site concerns (safety):	Danny Skookum injured his back while collecting a water sample on April 26, 2016. Denison Environmental Services (DES) and AAM were notified of the event. Danny remained onsite, resting his back at the Mount Nansen bunkhouse and left site with EDI on April 28, 2016. AAM was notified of this incident, and all necessary paperwork has been completed and filed. Danny is to visit a nurse prior to the next field visit to obtain medical clearance to determine if his physical condition is acceptable for working.

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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
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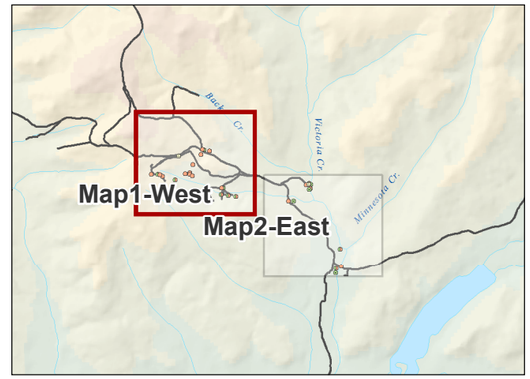
WQ-DC-B
H-DC-B
H/WQ-TP
H/WQ-SEEP
H-DC-M/WQ-DC-U



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

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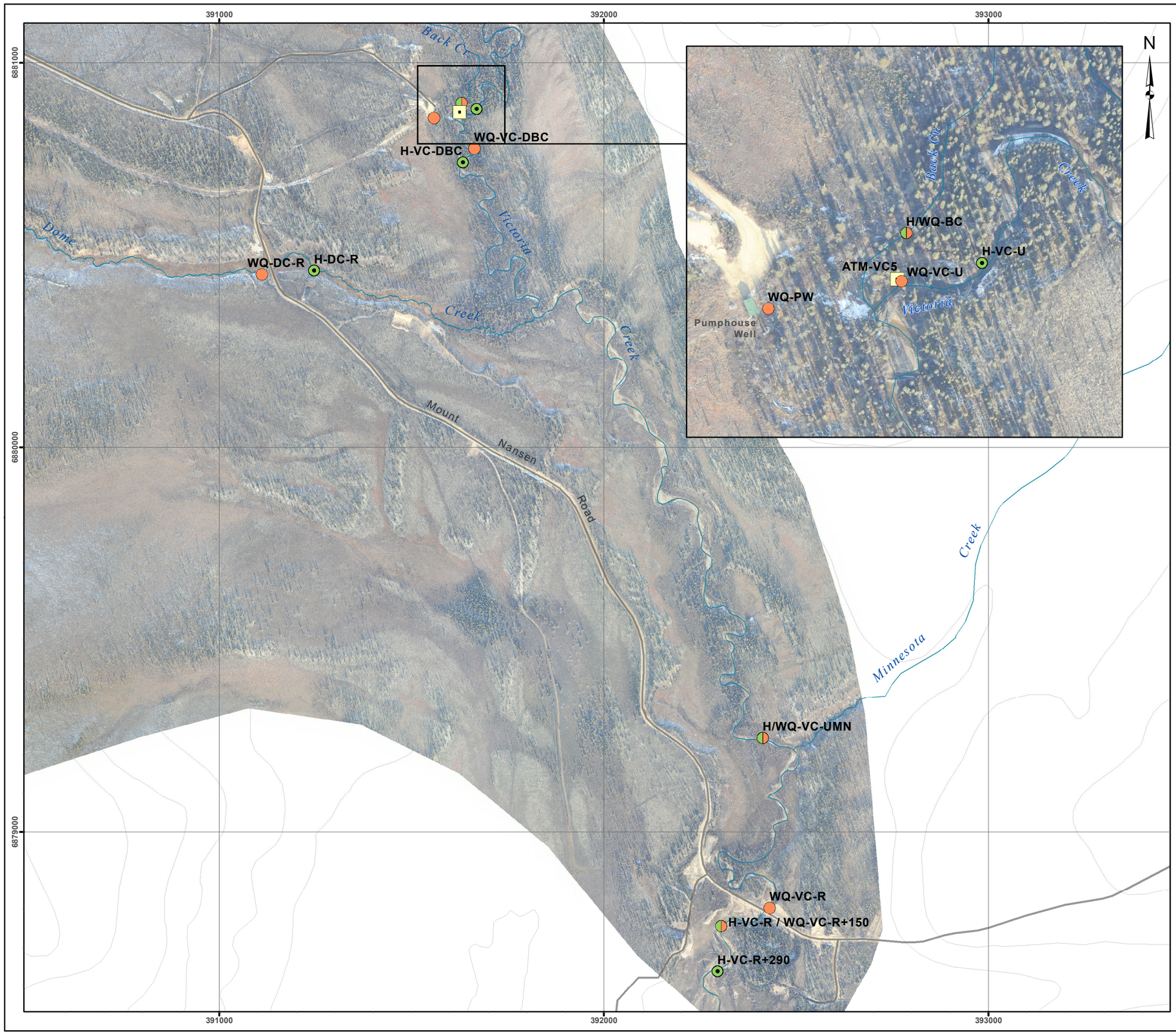

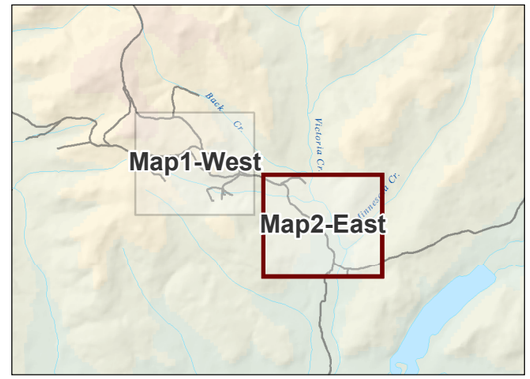

Legend

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

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

Notes:

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

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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

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MP	MM/SD	21/09/2015	**MAP 2**

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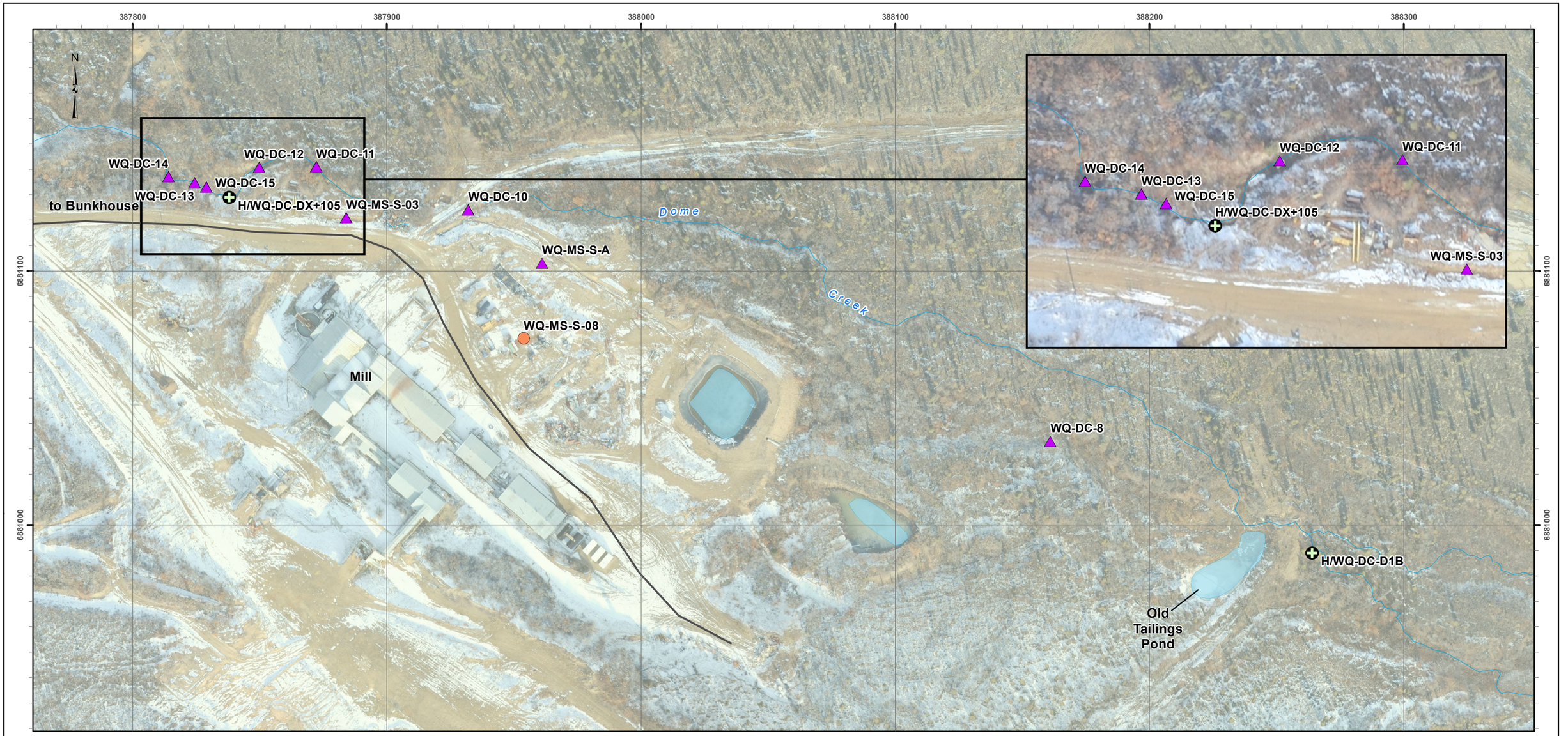


Dome Creek Investigation Sites

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.

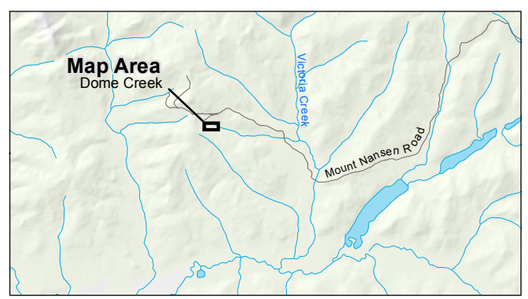
Watercourse, drainage areas and Mount Nansen Road layers digitized / modified by EDI (2011) using orthophotos provided by Yukon Government, Energy, Mines and Resources (2011).

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

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ATTACHMENT 2: SITE AND STATION PHOTOS

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Photo 1. WQ-VC-U – looking downstream (April 20, 2016).

Photo 2. WQ-VC-U – looking downstream (April 27, 2016).

Photo 3. H/WQ-DC-DX+105 – looking downstream (April 19, 2016).

Photo 4. H/WQ-DC-DX+105 – looking downstream (April 26, 2016).

Photo 5. H/WQ-DC-D1b – looking downstream. Water flowing on top of thick ice. (April 19, 2016)

Photo 6. H/WQ-DC-D1b – looking downstream. Water flowing on top of thick ice. (April 28, 2016)

Photo 7. WQ-DESS-01 – overview of site (April 20, 2016)

Photo 8. WQ-DESS-01 – overview of site (April 28, 2016)

Photo 9. WQ-DESS-02 – no detectable flow at site (April 20, 2016)

Photo 10. WQ-DESS-02 –overview of site. Site dry. (April 28, 2016)

Photo 11. WQ-DESS-03 – overview of site (April 20, 2016)

Photo 12. WQ-DESS-03 – overview of site. No detectable flow at site. (April 28, 2016).

Photo 13. WQ-LW-SEEP-01 – overview of site (April 20, 2016)

Photo 14. WQ-LW-SEEP-01 – overview of site. No detectable flow at site. (April 28, 2016).

Photo 15. WQ-CH-P-13-01 – looking downstream (April 20, 2016).

Photo 16. WQ-CH-P-13-01 – looking downstream. (April 28, 2016).

Photo 17. WQ-DC-B – looking upstream (April 19, 2016).

Photo 18. WQ-DC-B – looking upstream (April 28, 2016).

Photo 19. H-DC-B – looking downstream (April 19, 2016).

Photo 20. H-DC-B – looking downstream (April 28, 2016).

Photo 21. H/WQ-TP – overview of Tailings Pond (April 19, 2016).

Photo 22. H/WQ-TP – overview of Tailings Pond (April 28, 2016).

Photo 23. H/WQ-SEEP – looking downstream.

Photo 24. H/WQ-SEEP – looking downstream.

Photo 25. H-DC-M WP – overview of weir pond (April 18, 2016).

Photo 26. H-DC-M WP – overview of weir pond (April 28, 2016).

Photo 27. WQ-DC-U – looking downstream (April 18, 2016)

Photo 28. WQ-DC-U – looking downstream (April 28, 2016)

Photo 29. WQ-DC-R – looking downstream (April 18, 2016).

Photo 30. WQ-DC-R – looking downstream (April 28, 2016).

Photo 31. H-DC-R – looking downstream. Note anchor ice along bed (April 18, 2016).

Photo 32. H-DC-R – overview showing re-installed continuous station (April 28, 2016).

Photo 33. WQ-PC-U – overview of site (April 19, 2016)

Photo 34. WQ-PC-U – overview of site (April 27, 2016)

Photo 35. Overview of placer operations upstream of WQ-PC-U site (April 28, 2016)

Photo 36. WQ-NW-SEEP-02 – overview of seepage pipe (April 28, 2016)

Photo 37. WQ-ADIT-SEEP – overview of site (April 19, 2016)

Photo 38. WQ-ADIT-SEEP – overview of site (April 27, 2016)

Photo 39. H-PC-DSP – looking upstream at culvert (April 19, 2016)

Photo 40. H-PC-DSP – looking upstream at culvert (April 27, 2016)

Photo 41. WQ-PC-D – looking upstream (April 19, 2016).

Photo 42. WQ-PC-D – looking upstream (April 27, 2016).

Photo 43. H/WQ-BC – looking downstream (April 19, 2016).

Photo 44. H/WQ-BC – overview of new stilling well and staff gauge (April 19, 2016).

Photo 45. H/WQ-BC – looking downstream (April 27, 2016).

Photo 46. Confluence of Back Creek and Victoria Creek. Back Creek flows from right to left (April 27, 2016)

Photo 47. H-VC-U – looking upstream (April 19, 2016)

Photo 48. H-VC-U – looking upstream (April 27, 2016)

Photo 49. WQ-VC-U – looking downstream (April 20, 2016).

Photo 50. WQ-VC-U – looking downstream (April 27, 2016).

Photo 51. WQ-PW – looking downstream (April 20, 2016).

Photo 52. WQ-VC-U – looking downstream (April 28, 2016).

Photo 53. WQ-VC-DBC – overview of sample site (April 19, 2016).

Photo 54. WQ-VC-DBC – overview of sample site (April 27, 2016)

Photo 55. H-VC-DBC – looking upstream (April 19, 2016)

Photo 56. H-VC-DBC – looking upstream (April 27, 2016)

Photo 57. WQ-VC-UMN – looking upstream (April 19, 2016).

Photo 58. WQ-VC-UMN – looking downstream (April 27, 2016).

Photo 59. H-VC-UMN – overview of sample site (April 19, 2016).

Photo 60. H-VC-UMN – looking downstream (April 27, 2016)

Photo 61. H-VC-R – ice and braided channel downstream of culvert outlet (April 18, 2016)

Photo 62. Upstream of road crossing at H-VC-R showing water flowing along road embankment (April 18, 2016)

Photo 63. H-VC-R – overland flow beyond left downstream bank at H-VC-R. Converges with main channel upstream of H-VC-R+290 (April 18, 2016).

Photo 64. H-VC-R – looking downstream at main channel (April 18, 2016).

Photo 65. WQ-VC-R+150 – looking downstream (April 18, 2016).

Photo 66. H-VC-R – looking downstream (April 27, 2016)

Photo 67. H-VC-R – ice downstream of culvert outlet (April 27, 2016)

Photo 68. Upstream of road crossing at H-VC-R showing water flowing along road embankment (April 27, 2016)

Photo 69. H-VC-R +290 – looking downstream (April 18, 2016).

Photo 70. H-VC-R –Overland flow converges with main channel upstream of H-VC-R+290 (April 18, 2016).

Photo 71. H-VC-R+290 – looking downstream (April 27, 2016).

ATTACHMENT 3: APRIL HYDROLOGY DATA TABLES

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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
454	ATM-VC5	19/04/2016	10:00						Barologger sucessfully downloaded.
470	ATM-VC5	27/04/2016	15:45					N	Barologger sucessfully downloaded.
456	H-DC-DX+105	19/04/2016	17:40	V	0.001			N	Volumetric discharge measurement completed. Snow and ice covering channel. Flowrate below reportable confidence limits.
472	H-DC-DX+105	26/04/2016	18:25	V	0.008			N	Volumetric discharge measurement completed. Water level above bankfull conditions downstream of site. No snow or ice in channel.
457	H-DC-D1b	19/04/2016	9:10	N		X		N	Conditions not suitable for discharge measurement. Water flowing on top of ice. Ice estimated to be up to 2 m thick along channel.
473	H-DC-D1b	28/04/2016	16:00	N		X		N	Conditions not suitable for discharge measurement. Water flowing on top of ice with braided channels and multiple layers of ice. Ice estimated to be up to 2 m thick along channel.
458	H-DC-B	19/04/2016	16:20	SS	0.018	B		N	Salt tracer completed for discharge estimate. Ice and snow along south bank of channel. Minor anchor ice along bed of channel.
474	H-DC-B	28/04/2016	12:20	SS	0.046	B			Salt tracer completed for discharge measurement. Channel covered with ice downstream of site. Ice and snow along south bank of channel.
469	H-TP	19/04/2016	15:20	N				N	Very low water level in tailings pond. Staff gauges not wetted with snow approxiamtely 0.5 m behind gauges.
483	H-TP	28/04/2016	11:40					N	Very low water level in tailings pond. Edge of water is 1 m behind staff gauges. Centre of pond covered with ice up to 0.25 m thick.
466	H-SEEP	19/04/2016	15:00	V	0.002				Volumetric measurement collected at pipe outlet. Flow rate at pump at 14:50 150.478 L/min (0.003 m3/s) and total discharge = 248,276 L.
482	H-SEEP	28/04/2016	10:50	V	0.003				Volumetric measurement collected at pipe outlet. Flow rate at pump at 13:30 177.723 L/min (0.003 m3/s) and total discharge = 599,361 L.
475	H-DC-M WP	28/04/2016	9:55	SS	0.040	E			Small volume of water flows between metal weir plate and wooden support structure; visually estimated to be less than 1 L/s. Water flows around right downstream edge of pond structure; visually estimated to be 2 L/s. Staff gauge not wetted due to accumula
460	H-DC-R	18/04/2016	16:20	SS	0.040				Ancor ice present along portions of bed. Salt tracer completed for discharge estimate.
476	H-DC-R	28/04/2016	14:10	SS	0.055		0.710		Stilling well, staff gauge, and continuous logger installed. Channel ice free. Small secondary channel of overland flow not conained in primary channel; flow rate visually estimated to be 3 L/s.
455	H-PC-DSP	19/04/2016	16:40	V	0.004			N	Volumetric discharge measurement collected at culvert outlet. Ice along banks of channel.
471	H-PC-DSP	27/04/2016	9:30	V	0.013	E		N	Volumetric discharge measurement completed at culvert outlet. Minor ice along banks of channel. No active placer mining activities immediately upstream; water flowing freely through channel.
463	H-BC	19/04/2016	11:50	ADV-MID	0.074		1.734		Stilling well, staff gauge and continuous logger installed. ADV discharge measurement completed. Highly tubid water in channel.

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
479	H-BC	27/04/2016	15:10	ADV-MID	0.179		1.938		ADV completed for discharge measurement. No snow or ice in channel. Highly turbid water.
461	H-VC-U	19/04/2016	10:30	ADV-MID	0.263		2.085		ADV discharge measurement completed. Thin shore ice, less than 1 cm thick.
477	H-VC-U	27/04/2016	13:35	ADV-MID	1.367		2.239		Water level at bankfull elevation at vegetation line. ADV completed for discharge measurement.
468	H-PW	20/04/2016	11:55	V	0.003				Volumetric discharge measurement completed. Summer discharge site and hose in use.
462	H-VC-DBC	19/04/2016	9:35	ADV-MID	0.268		1.870		Thin anchor ice (1cm) present along bed of channel with some thin shore ice. ADV discharge measurement completed. Highly tubid water in channel.
478	H-VC-DBC	27/04/2016	11:55	ADV-MID	1.536		1.987		High flow rate with high water marks visible at higher elevation. ADV completed for discharge measurement.
464	H-VC-UMN	19/04/2016	13:30	ADV-MID	0.195		1.622		Moderate amount of shore ice up to 0.1 m thick. ADV discharge measurement completed.
480	H-VC-UMN	27/04/2016	19:15	ADV-MID	1.460		1.796		ADV completed for discharge measurement. Evidence of higher flows with folded vegetation along banks.
465	H-VC-R+290	18/04/2016	13:35	ADV-MID	0.559		2.447		ADV discharge measurement completed. Braided channel upstream of station due to thick ice causing overland flow along left downstream floodplain. Overland flow converges with main channel upstream of station. Estimated 10 L/s of overland flow not captured.
481	H-VC-R+290	27/04/2016	17:10	ADV-MID	1.754		2.563		ADV completed for discharge measurement. Ponded water along left downstream floodplain where flowing water was observed during previous visit. Small side channel along right bank ; flowrate visually estimated to be less than 2 L/s.

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-U	Upper Victoria Creek
H-VC-UMN	Victoria Creek Upstream of Minnesota Creek

Discharge Data Flag Legend

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

Survey Data Flag Legend

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

ATTACHMENT 4: APRIL WATER QUALITY DATA TABLES

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Water Quality Site	Sample Collected? (Y/N)	Measurement Date	Comments
WQ-ADIT-SEEP	N	19-Apr-16	Snow and ice covers rock wall face. No visible seepage flow or evidence of historical flows. No sample collected.
WQ-ADIT-SEEP	N	27-Apr-16	No evidence of seepage from bank or flows originating at higher elevation than channel. Snow cover along slope. No sample collected.
WQ-BC	Y	19-Apr-16	Flowing water is moderate. Light brown in colour. Shore ice ~1-8cm thick.
WQ-BC	Y	27-Apr-16	High flow with very turbid water. No ice or snow in channel.
WQ-CH-P-13-01	Y	20-Apr-16	Low, steady flow at site. Sample collected at small waterfall. Chipped away ice to expose flowing water. Ice present in channel, with most snow in vicinity melted.
WQ-CH-P-13-01	Y	28-Apr-16	Patchy ice and snow in channel on slope and on channel sides.
WQ-DC-B	Y	19-Apr-16	Water has orange tint to it. Flowing water is on top of ice frozen to bed. Ice thickness varies as it is frozen to bed (~10-15cm thick). Snow and ice on RDB bank. Sample collected at u/s edge of bridge.
WQ-DC-B	Y	28-Apr-16	Temp SPC pH measured with HANNA Pen. Ice on banks.
WQ-DC-D1b	Y	20-Apr-16	Water flowing on top of ice. Ice estimated to be 2 m thick below sampling location. Ice thickness above water surface 0.05 m.
WQ-DC-D1b	Y	28-Apr-16	Thick ice present at site with water flowing over top with braided channels.
WQ-DC-DX	Y	19-Apr-16	Low flowrate in poorly defined channel. Portion of water goes to ground upstream of sampling site. Chipped pathway on ice confine flow into single channel.
WQ-DC-DX	Y	26-Apr-16	Snow-ice cover up to 0.1m thick. Braided channel downstream of sample site.
WQ-DC-DX+105	Y	19-Apr-16	Channel covered with thin layer of snow and soft ice. Banks covered with hard ice. Replicate collected at 1800.
WQ-DC-DX+105	Y	26-Apr-16	Water level higher than previous visit. Water above bank full conditions downstream of site. Slight tannin colour to water. No snow or ice in channel. Some snow on ground in vicinity of site.
WQ-DC-R	Y	18-Apr-16	Sample collected upstream of culvert at typical location. Braided channel with minor flow along left side of valley. Anchor ice along approximately half of channel bed along main channel.
WQ-DC-R	Y	28-Apr-16	Overflow present upstream of sample site. Braided channel upstream of sample site. Replicate collected at 13:30.
WQ-DC-U	Y	28-Apr-16	Overflow ice present upstream of weir. Minor ice on banks 1 cm thick.
WQ-DC-U	Y	18-Apr-16	Valley covered with patches of ice with silt and vegetation on top of ice. Some locations with orange staining. Flow contained in single channel. Ice covers portions of channel, up to 0.1 m thich.
WQ-DESS-01	Y	28-Apr-16	Minor ice at edges of the channel less than 1 cm thick.
WQ-DESS-01	Y	20-Apr-16	Mod flow for site. D/s flow follows road.

Water Quality Site	Sample Collected? (Y/N)	Measurement Date	Comments
WQ-DESS-02	N	28-Apr-16	Zero flow. Dry channel.
WQ-DESS-02	N	20-Apr-16	Standing water at site, but no detectable flow. No sample collected. Bank is free of ice and snow, roadway covered with ice downstream of sampling location.
WQ-DESS-03	N	28-Apr-16	Standing water no flow. No sample obtained.
WQ-DESS-03	Y	20-Apr-16	Low, steady flow from typical seepage location along road. Sample collected from small waterfall.
WQ-LW-SEEP-01	N	28-Apr-16	Site dry. No sample collected.
WQ-LW-SEEP-01	N	20-Apr-16	Site dry. Minor patches of snow present in vicinity of sample site.
WQ-NW-SEEP-02	Y	28-Apr-16	Ice on site and in pipe when bag was installed at 8:45. Install photos on JB camera. Site photos on SD camera.
WQ-PC-D	Y	27-Apr-16	Minor patches of ice on edges of channel 1 to 3 cm thick. Channel is braided at sampling site. Bar in centre of channel is not submerged.
WQ-PC-D	Y	19-Apr-16	Ice and snow over majority of channel u/s. Small amounts of shore ice at sample location (<1cm). Water is lightly rust coloured. Possible cause for increased turbidity could be from road and LDB slop u/s of sampling area. See photos
WQ-PC-U	Y	27-Apr-16	Braided channel downstream of sampling site, with ice on edges of active channels. White Foam downstream of site. Ice up to 0.01 m thick in vicinity of site.
WQ-PC-U	Y	19-Apr-16	Some ice present in d/s pool. Water flow is mod.
WQ-PW	Y	28-Apr-16	Normal flow conditions.
WQ-PW	Y	20-Apr-16	Drinking water bottle set and bacteriological sample collected. Summer discharge site and hose in use.
WQ-SEEP	Y	28-Apr-16	Replicate collected at 10:35. No snow or ice at site. Foam has orange colour with orange dust and staining on vegetation.
WQ-SEEP	Y	19-Apr-16	Red hue to water and redish orange dust along vegetation. Noticeable smell to seepage outlet similar to wet moss. Light sheen along bank downstream of outlet.
WQ-TP	Y	28-Apr-16	Thinly ice covered at edge of pond. Ice up to 0.25 m thick at sampling location at centre of pond. Chipped hole in ice. Allowed to settle for 5 minutes prior to collecting sample.
WQ-TP	Y	19-Apr-16	Water level very low. Sample collected near centre of pond where water available. Augured hole through ice. Approximately 0.5 m of water below bottom of ice surface.
WQ-VC-DBC	Y	27-Apr-16	Channel is completely ice and snow free. High flow conditions. Very turbid water with small pieces of organic and sediment visible in samples.
WQ-VC-DBC	Y	19-Apr-16	Moderate shore ice. Ice in channel <1cm in areas with vegetation. Water has red colour to it.
WQ-VC-R+150	Y	27-Apr-16	No ice or ice in channel. Water above right bank.

Water Quality Site	Sample Collected? (Y/N)	Measurement Date	Comments
WQ-VC-R+150	Y	18-Apr-16	Sample collected at winter sampling location. Braided channel upstream of road. Tannin coloured water. Minor amount of snow remains in floodplain.
WQ-VC-U	Y	27-Apr-16	High flow with very turbid water. No snow or ice in channel. Sample collected from centre of channel.
WQ-VC-U	Y	19-Apr-16	Site was small amount of shore ice <1cm. Some snow remains on banks. Baro D/L, sync'd, and set to continuous linear logging. Some sheen on water near ice. Remains cohesive when disturbed. Red colour to water.
WQ-VC-UMN	Y	27-Apr-16	No snow or ice in channel. Highly turbid water. Sample collected along right bank.
WQ-VC-UMN	Y	19-Apr-16	Mod amounts of shore ice. 10cm thick. Water is red in colour.
QA/QC Samples			
Replicate 1	Y	20-Apr-16	Collected replicate sample at WQ-VC-U-r.
Replicate 2	Y	19-Apr-16	Collected replicate sample at WQ-DC-DX+105-r.
Field Blank	Y	19-Apr-16	Field blank collected at WQ-LW-SEEP-01.
Travel Blank	Y	20-Apr-16	Lab filled bottles were carried around site.
Replicate 1	Y	28-Apr-16	Collected replicate sample at WQ-SEEP-r.
Replicate 2	Y	28-Apr-16	Collected replicate sample at WQ-DC-R-r.
Field Blank	Y	28-Apr-16	Field blank collected at WQ-PW.
Travel Blank	Y	28-Apr-16	Lab filled bottles were carried around site.

Summary of Water Quality Results for the April 19-20, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1758226-1 WQ-DESS-03 20/04/2016 09:30	L1758226-2 WQ-DESS-01 20/04/2016 09:50	L1758226-3 WQ-DC-D1B 20/04/2016 09:10	L1758226-4 WQ-CH-P-13-01 20/04/2016 10:00	L1758226-5 WQ-VC-UMN 19/04/2016 13:35	L1758226-6 WQ-SEEP 19/04/2016 14:50	L1758226-7 WQ-VC-DBC 19/04/2016 09:45	L1758226-8 WQ-BC 19/04/2016 11:00	L1758226-9 WQ-DC-DX+105 19/04/2016 17:55	L1758226-10 WQ-DC-DX+105-R 19/04/2016 18:00	QA/QC WQ-DC-DX+105 Replicate Analysis	L1758226-11 WQ-TP 19/04/2016 17:15	L1758226-14 WQ-VC-U 20/04/2016 12:00	L1758226-15 WQ-VC-U-R 20/04/2016 12:05	QA/QC WQ-VC-U Replicate Analysis
Temperature (in-situ)	°C	-	-	-	0.3	0.3	0.9	0.1	0.2	1.4	0.5	0.1	0.2	-	-	3.4	0.4	-	-
Specific Conductivity (in-situ)	µS/cm	-	-	-	59.2	308.9	789.2	625.8	205.7	1580	168.6	219.8	173.8	-	-	1864	159.5	-	-
pH (in-situ)	pH	6.5 - 9.0	6.0 - 8.5	-	7.26	***5.59***	7.57	***4.92***	7.61	7.02	7.48	7.94	7.48	-	-	7.45	7.49	-	-
Dissolved Oxygen (in-situ)	mg/L	-	-	-	10.65	10.69	9.88	10.84	10.41	3.81	10.37	11.09	9.77	-	-	5.69	10.34	-	-
Turbidity (In-situ)	NTU	-	-	-	0.51	0.77	0.44	0.16	2.14	19.2	3.58	29.3	5.24	-	-	1.18	1.59	-	-
Dissolved Oxygen (in-situ - Pit only)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colour, True	CU	15	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity	µS/cm	-	-	2	45	314	798	635	228	1532	169	218	173	172	1%	537	162	165	2%
Hardness (as CaCO3)	mg/L			0.5	29.5	163	466	360	123	865	89.7	120	84.1	83.5	1%	286	85.7	86.2	1%
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	***6.11***	***5.60***	7.93	***5.02***	7.72	7.01	7.66	7.79	7.24	7.23	0%	7.67	7.69	7.71	0%
Total Suspended Solids	mg/L	-	50	3	5.3	<3.0	<3.0	<3.0	<3.0	44.7	4.7	44	<3.0	<3.0	<DL	<3.0	24	27.3	13%
Total Dissolved Solids	mg/L	-	-	1	22	194	535	430	131	1160	91.6	128	103	103	0%	360	88.1	89.1	1%
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	7.7	3.8	150	<1.0	71.3	251	67.6	63.6	31.3	32.3	3%	31	69.5	70.9	2%
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<DL	<1.0	<1.0	<1.0	<DL
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<DL	<1.0	<1.0	<1.0	<DL
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	7.7	3.8	150	<1.0	71.3	251	67.6	63.6	31.3	32.3	3%	31	69.5	70.9	2%
Ammonia, Total (as N)	mg/L	0.75	-	0.005	0.007	0.0061	0.0566	0.0066	<0.0050	***3.89***	0.0063	0.0092	0.0143	0.0079	<2xDL	0.116	<0.0050	<0.0050	<DL
Chloride (Cl)	mg/L	120	-	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	0.63	0.66	<2xDL	<0.50	<0.50	<0.50	<DL
Fluoride (F)	mg/L	0.12	-	0.02	0.031	0.033	***0.127***	0.04	0.049	0.084	0.047	0.069	0.046	0.047	<2xDL	0.068	0.046	0.043	<2xDL
Nitrate (as N)	mg/L	13	-	0.005	<0.0050	<0.0050	<0.0050	<0.0050	0.0426	0.381	0.064	0.0486	<0.0050	0.0064	<DL	0.0765	0.0666	0.0648	3%
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0219	<0.0010	<0.0010	<0.0010	<0.0010	<DL	<0.0010	<0.0010	<0.0010	<DL
Sulfate (SO4)	mg/L	-	-	0.5	3.36	131	275	303	41.5	634	16.3	42.5	43.8	43.7	0%	229	13.4	13.3	1%
Anion Sum	meq/L	-	-	-	0.23	2.81	8.73	6.31	2.3	18.3	1.7	2.16	1.56	1.58	-	5.4	1.67	1.7	-
Cation Sum	meq/L	-	-	-	0.72	3.42	9.6	7.43	2.62	20.2	1.93	2.58	1.96	1.95	-	5.98	1.84	1.85	-
Cation - Anion Balance	%	-	-	-	52.2	9.9	4.7	8.2	6.7	5	6.4	8.9	11.5	10.5	-	5.1	4.8	4.2	-
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0159	<0.0050	<0.0050	<0.0050	<0.0050	<DL	<0.0050	<0.0050	<0.0050	<DL
Cyanide, Total	mg/L	-	0.3	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0652	<0.0050	<0.0050	<0.0050	<0.0050	<DL	<0.0050	<0.0050	<0.0050	<DL
Cyanate	mg/L	-	-	0.2	<2.0	<0.20	<0.20	<0.20	<0.20	<0.20	0.22	<0.20	<0.20	<0.20	<DL	<0.20	<0.20	<0.20	<DL
Thiocyanate (SCN)	mg/L	-	-	0.5	2.36	1.43	0.61	1.05	0.69	4.9	0.63	0.8	0.94	0.97	<2xDL	<0.50	0.53	0.53	<2xDL
Aluminum (Al)-Total	mg/L	0.1	-	0.003	***0.582***	***0.26***	0.0243	***0.478***	***0.12***	0.0436	***0.234***	***1.04***	***0.269***	***0.232***	15%	0.0057	***0.332***	***0.436***	27%
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.00014	<0.00010	0.00634	0.00011	0.00031	0.00059	0.0001	0.00044	0.00322	0.00326	1%	0.0102	<0.00010	0.00012	<DL
Arsenic (As)-Total	mg/L	0.005	-	0.0001	0.00251	0.00192	***0.0182***	0.0025	0.00298	***0.11***	0.00101	***0.00764***	***0.021***	***0.02***	5%	***0.0245***	0.00063	0.00074	16%
Barium (Ba)-Total	mg/L	-	1.0	0.00005	0.0421	0.0132	0.0281	0.0167	0.0627	0.0673	0.0686	0.0689	0.0265	0.0262	1%	0.00588	0.0703	0.0729	4%
Beryllium (Be)-Total	mg/L	-	-	0.00002	0.000033	<0.000010	<0.000020	0.000039	<0.000020	<0.000020	<0.000020	0.000055	0.000045	0.000045	<2xDL	<0.000020	0.000022	0.000026	<2xDL
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000093	<0.000050	<0.000050	<DL	<0.000050	<0.000050	<0.000050	<DL
Boron (B)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	0.05	<0.010	<0.010	<0.010	<0.010	<DL	0.016	<0.010	<0.010	<DL
Cadmium (Cd)-Total *(Lab Result)*	mg/L	0.00009	0.02	0.00001	***0.0000889***	***0.002***	0.000359	***0.00599***	0.0000406	0.000252	0.000053	***0.000311***	***0.0028***	***0.00275***	2%	***0.000534***	0.0000284	0.0000264	<2xDL
Cadmium (Cd)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.000058*	*0.000238*	*0.000370*	*0.000370*	*0.000188*	*0.000370*	*0.000145*	*0.000184*	*0.000137*	*0.000136*	-	*0.000370*	*0.000139*	*0.000140*	-
Calcium (Ca)-Total	mg/L	-	-	0.05	8.69	39.5	114	78.2	31.6	258	22.9	32.1	23.6	23.2	2%	82.9	20.7	21	1%
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	<0.00060	<0.00030	<0.00020	<0.00040	<0.00030	<0.00090	<0.00030	0.00139	<0.00030	0.00041	<DL	<0.00010	0.00043	0.00075	54%
Cobalt (Co)-Total	mg/L	-	-	0.0001	0.00032	<0.00010	0.00024	0.0002	0.00016	0.00727	0.00016	0.0007	0.00014	0.00014	<2xDL	0.00026	0.0002	0.00024	<2xDL
Copper (Cu)-Total *(Lab Result)*	mg/L	0.002	0.2	0.0005	***0.00468***	0.0026	0.00307	0.00257	0.00246	0.00261	***0.00266***	***0.00533***	***0.0175***	***0.0174***	1%	***0.0102***	***0.00254***	***0.00288***	13%
Copper (Cu)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.00200*	*0.00359*	*0.00400*	*0.00400*	*0.00282*	*0.00400*	*0.00216*	*0.00276*	*0.00204*	*0.00203*	-	*0.00400*	*0.00207*	*0.00208*	-
Iron (Fe)-Total	mg/L	0.3	1	0.01	***0.544***	0.145	0.196	***0.42***	0.252	***19.6***	***0.353***	***1.58***	***0.334***	***0.311***	7%	0.038	***0.543***	***0.642***	17%
Lead (Pb)-Total *(Lab Result)*	mg/L	0.001	0.1	0.00005	0.000208	0.00007	0.000633	0.000298	0.00039	0.000451	0.000415	***0.00462***	***0.00579***	***0.00532***	8%	0.000424	0.000341	0.000419	21%
Lead (Pb)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00005*	*0.00100*	*0.00593*	*0.00700*	*0.00700*	*0.00414*	*0.00700*	*0.00277*	*0.00401*	*0.00255*	*0.00253*	-	*0.00700*	*0.00261*	*0.00263*	-
Lithium (Li)-Total	mg/L	-	-	0.0005	<0.0010	<0.0010	0.0045	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<DL	0.0011	<0.0010	<0.0010	<DL
Magnesium (Mg)-Total	mg/L	-	-	0.1	1.72	13.7	37.4	34.1	10.1	57.3	7.49	7.85	5.31	5.23	2%	14.6	7.16	7.21	1%
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	0.0379	0.0565	***0.685***	0.406	0.0476	***6.18***	0.069	0.362	0.0483	0.0479	1%	0.237	0.0381	0.0414	8%
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	***0.0000268***	0.00002	0.0000076	0.0000183	0.0000094	0.0000092	0.0000116	0.0000165	0.0000198	0.0000185	<2xDL	<0.0000050	0.0000102	0.0000103	<2xDL
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	<0.000050	<0.000050	<0.00025	<0.000050	<0.00035	0.00106	<0.00040	0.000769	<0.00010	0.000093	<DL	0.000385	0.000305	0.000376	21%
Nickel (Ni)-Total *(Lab Result)*	mg/L	0.025	0.3	0.0005	0.00169	0.0026	0.00093	0.00407	0.00079	0.0029	0.00082	0.00166	0.00161	0.00166	<2xDL	0.00066	0.00087	0.00094	<2xDL
Nickel (Ni)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.02500*	*0.13855*	*0.15000*	*0.15000*	*0.11186*	*0.15000*	*0.08800*	*0.10978*	*0.08379*	*0.08334*	*0.02500*	*0.15000*	*0.08500*	*0.08538*	*0.02500*
Phosphorus (P)-Total	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.053	0.056	0.064	<2xDL	<0.050	<0.050	<0.050	<DL
Potassium (K)-Total	mg/L	-	-	0.1	2.02	2.27	3.88	2.64	1.33	6.12	1.19	1.54	7.7	7.53	2%	3.49	1.01	1.04	3%
Selenium (Se)-Total	mg/L	0.001	-	0.0001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000259	<0.000050	0.000056	0.000093	0.000058	<2xDL	<0.000050	<0.000050	<0.000050	<DL
Silicon (Si)-Total	mg/L	-	-	0.05	2.64	2.78	5.64	3.06	4.97	8.18	5.14	6.26	5.17	5.01	3%	1.02	5.1	5.19	2%
Silver (Ag)-Total	mg/L	0.0001	0.1	0.00001	0.000019	<0.000010	0.000024	0.000019	0.000011	0.00004	<0.000010	0.000082	***0.000131***	***0.000117***	11%	0.000035	<0.000010	<0.000010	<DL
Sodium (Na)-Total	mg/L	-	-	0.05	0.645	0.895	3.24	1.4	2.62	34.7	2.07	2.31	0.764	0.769	1%	3.18	1.99	2.03	2%
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.0402	0.103	0.278	0.202	0.236	0.753	0.231	0.209	0.0572	0.0558	2%	0.206	0.227	0.233	3%
Sulfur (S)-Total	mg/L	-	-	0.5	1.49	43.9	91.1	102	14.3	228	5.71	13.7	14.7	14.7	1%	74.2	4.23	4.22	0%
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	0.000014	<0.000010	<0.000010	<0.000010	<0.000010	0.00002	0.000015	0.000013	<2xDL	0.000034	<0.000010	<0.000010	<DL
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<DL	<0.00010	<0.00010	<0.00010	<DL
Titanium (Ti)-Total	mg/L	-	-	0.0003	0.00956	0.00165	0.0005	0.00492	0.0023	0.0023	0.00558	0.0309	0.00323	0.00262	21%	<0.00030	0.0107	0.0134	22%
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.000331	<0.000010	0.00151	0.000019	0.000535	0.00164	0.000542	0.00109	0.000082	0.00008	2%	0.000421	0.000504	0.000551	9%
Vanadium (V)-Total	mg/L	-	-	0.0005	0.00115	<0.00050	<0.00050	0.00075	<0.00050	0.00317	0.00072	0.00274	0.00058	0.00057	<2xDL	<0.00050	0.00118	0.00149	<2xDL
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	0.0127	***0.814***	***0.171***	***1.94***	0.0053	0.0291	0.0036	0.0153	***0.357***	***0.341***	5%	***0.0525***	0.0041	0.0044	<2xDL
Zirconium (Zr)-Total	mg/L	-	-	0.0003	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.00072	<0.00030	0.00046	<0.00030	<0.00030	<DL	<0.00030	<0.00030	<0.00030	<DL
Aluminum (Al)-Dissolved	mg/L	0.1	-	0.001	***0.319***	***0.245***	0.0202	***0.284***	0.0563	0.0152	0.0734	***0.118***	***0.186***	***0.192***	3%	0.0016	0.0602	0.0613	2%
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	0.00645	<0.00010	0.00028	0.00046	<0.00010	0.0002	0.00238	0.00239	0%	0.0108	<0.00010	<0.00010	<DL
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	0.00156	0.00179	***0.0178***	0.00156	0.00247	***0.0809***	0.00055	0.00216	***0.0134***	***0.0135***	1%	***0.0233***	0.0003	0.00028	<2xDL
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0381	0.0136	0.0273	0.0131	0.0609	0.0626	0.0641	0.0563	0.0246	0.0261	6%	0.00624	0.0672	0.0665	1%
Beryllium (Be)-Dissolved	mg/L	-	-	0.00002	0.000026	0.00003	<0.000020	0.000033	<0.000020	<0.000020	<0.000020	0.000023	0.000045	0.000046	<2xDL	<0.000020	<0.000020	<0.000020	<DL
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<DL	<0.000050	<0.000050	<0.000050	<DL
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	0.045	<0.010	<0.010	<0.010	<0.010	<DL	0.016	<0.010	<0.010	<DL
Cadmium (Cd)-Dissolved *(Lab Result)*	mg/L	0.00009	-	0.00001	***0.0000723***	***0.00212***	0.000272	***0.00559***	0.0000472	0.000183	0.0000414	***0.000199***	***0.00262***	***0.00276***	5%	***0.000562***	0.0000141	0.0000172	<2xDL
Cadmium (Cd)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.000058*	*0.000238*	*0.000370*	*0.000370*	*0.000188*	*0.000370*	*0.000145*	*0.000184*	*0.000137*	*0.000136*	-	*0.000370*	*0.000139*	*0.000140*	-
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	8.94	41.7	122	84.7	32.2	254	23.3	34.5	24.6	24.5	0%	89.1	22	22.1	0%
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	0.00024	0.00018	<0.00010	0.00013	0.00011	0.00043	0.00013	0.00017	0.00019	0.00022	<2xDL	<0.00010	0.0001	0.00019	<2xDL
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	0.00022	<0.00010	0.00012	0.00654	<0.00010	0.00028	0.00011	0.00012	<2xDL	0.0003	<0.00010	<0.00010	<DL
Copper (Cu)-Dissolved *(Lab Result)*	mg/L	0.002	-	0.0002	***0.00386***	0.00249	0.00269	0.00213	0.00225	0.00137	***0.00237***	***0.00384***	***0.0166***	***0.018***	8%	***0.0106***	***0.0021***	0.00202	4%
Copper (Cu)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00200*	*0.00200*	*0.00359*	*0.00400*	*0.00400*	*0.00282*	*0.00400*	*0.00216*	*0.00276*	*0.00204*	*0.00203*	-	*0.00400*	*0.00207*	*0.00208*	-
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	0.136	0.111	0.185	0.062	0.159	***17.3***	0.159	0.232	0.182	0.179	2%	0.014	0.141	0.141	0%
Lead (Pb)-Dissolved *(Lab Result)*	mg/L	0.001	-	0.00005	<0.000050	0.000073	0.000326	<0.000050	0.000112	<0.000050	0.000063	0.000346	0.00188	0.00204	8%	0.000129	<0.000050	<0.000050	<DL
Lead (Pb)-Diss. (Hardness Adjusted Guideline)	*mg/L*			*0.00005*	*0.00100*	*0.00593*	*0.00700*	*0.00700*	*0.00414*	*0.00700*	*0.00277*	*0.00401*	*0.00255*	*0.00253*	-	*0.00700*	*0.00261*	*0.00263*	-
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	<0.0010	<0.0010	0.0044	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<DL	0.0018	<0.0010	<0.0010	<DL
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	1.75	14.3	39.4	36	10.3	55.9	7.63	8.27	5.5	5.43	1%	15.5	7.51	7.53	0%
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.00321	0.0547	0.655	0.19	0.04	5.63	0.0605	0.33	0.0409	0.0441	8%	0.271	0.0266	0.0267	0%
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	0.0000199	0.0000127	<0.0000050	0.0000105	0.0000064	0.0000065	0.0000065	0.0000077	0.0000122	0.0000116	<2xDL	<0.0000050	<0.0000050	0.0000057	<DL
Molybdenum (Mo)-Dissolved	mg/L	0.0073	-	0.00005	<0.000050	<0.000050	0.000158	<0.000050	0.000299	0.000913	0.000305	0.000709	<0.000050	0.000058	<DL	0.000426	0.000275	0.000273	1%
Nickel (Ni)-Dissolved *(Lab Result)*	mg/L	0.025	-	0.0005	0.00158	0.00252	0.00081	0.00374	0.00069	0.00249	0.00068	0.00115	0.00152	0.00171	<2xDL	0.00062	0.00071	0.00065	<2xDL
Nickel (Ni)-Diss. (Hardness Adjusted Guideline)	*mg/L*			*0.0005*	*0.02500*	*0.13855*	*0.15000*	*0.15000*	*0.11186*	*0.15000*	*0.08800*	*0.10978*	*0.08379*	*0.08334*	-	*0.15000*	*0.08500*	*0.08538*	-
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<DL	<0.050	<0.050	<0.050	<DL
Potassium (K)-Dissolved	mg/L	-	-	0.1	2.13	2.4	4.18	2.83	1.37	6.01	1.16	1.48	8.01	7.83	2%	3.62	1.04	1.06	2%
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	<0.000050	<0.000050	<0.000050	0.000058	0.000052	0.000266	0.00005	0.000051	0.000097	0.000091	<2xDL	<0.000050	0.000056	<0.000050	<DL
Silicon (Si)-Dissolved	mg/L	-	-	0.05	2.35	2.83	5.9	3.02	4.89	7.88	4.86	4.94	4.97	4.95	0%	1.07	4.84	4.85	0%
Silver (Ag)-Dissolved	mg/L	0.00025	-	0.00001	<0.000010	<0.000010	0.000014	<0.000010	<0.000010	0.000012	<0.000010	0.000014	0.000047	0.000054	14%	0.000018	<0.000010	<0.000010	<DL
Sodium (Na)-Dissolved	mg/L	-	-	0.05	0.673	0.921	3.28	1.38	2.58	31	1.99	2.41	0.75	0.781	4%	3.25	1.98	1.99	1%
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.0392	0.105	0.278	0.202	0.235	0.718	0.227	0.212	0.0544	0.0553	2%	0.218	0.231	0.229	1%
Sulfur (S)-Dissolved	mg/L	-	-	0.5	1.51	44.8	92.6	105	14.2	212	5.52	14.2	13.6	13.5	1%	76.5	4.29	4.32	1%
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	0.000013	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000011	0.000012	<2xDL	0.000036	<0.000010	<0.000010	<DL
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<DL	<0.00010	<0.00010	<0.00010	<DL
Titanium (Ti)-Dissolved	mg/L	-	-	0.0003	0.00088	0.00078	0.0004	0.00053	0.00074	0.00096	0.00072	0.00215	0.00136	0.00152	11%	<0.00030	0.00048	0.0005	<2xDL
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	<0.000010	<0.000010	0.00144	<0.000010	0.000516	0.0016	0.000514	0.00103	0.000067	0.000074	10%	0.000442	0.000463	0.00046	1%
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00226	<0.00050	<0.00050	<0.00050	<0.00050	<DL	<0.00050	<0.00050	<0.00050	<DL
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	0.0121	***0.859***	***0.17***	***1.95***	0.0046	0.0255	0.003	0.005	***0.355***	***0.371***	4%	***0.0566***	0.0029	0.0019	<2xDL
Zirconium (Zr)-Dissolved	mg/L	-	-	0.0003	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.0007	<0.00030	0.00032	<0.00030	<0.00030	<DL	<0.00030	<0.00030	<0.00030	<DL

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

COLOUR KEY:

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

Notes:

QA/QC Comments: The **Travel Blank** sample did not have any parameters above detection limit. No contamination from storage or transport is suspected.
The **Field Blank** did not have any parameters above detection limits. No contamination from field sampling methodology is suspected.
QA/QC Replicate Analysis - the average RPD of the replicate sample WQ-DC-DX+105-r was 4% with an average difference of 5% for total and 5% for dissolved metals.
The average RPD of the replicate sample WQ-VC-U-r was 6% with an average difference of 12% for total and 1% for dissolved metals.
Total Aluminum, Chromium, Lead, Molybdenum and Titanium had RPD>20% (indicating intrinsically high sample variability).

See methodology document for details on QA/QC methods.

Summary of Water Quality Results for the April 19-20, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1758226-16 WQ-PC-U 19/04/2016 16:40	L1758226-17 WQ-DC-DX 19/04/2016 18:15	L1758226-18 WQ-DC-B 19/04/2016 15:45	L1758226-19 WQ-VC-R+150 18/04/2016 14:00	L1758226-20 WQ-PC-D 19/04/2016 17:00	L1758226-21 WQ-DC-U 18/04/2016 17:30	L1758226-22 WQ-DC-R 18/04/2016 16:00	L1758226-12 FIELD BLANK 20/04/2016 10:45	L1758226-13 TRAVEL BLANK	L1758238-1 WQ-PW 20/04/2016 11:55
Temperature (in-situ)	°C	-	-	-	0.3	0.2	0	-0.2	0.3	0.2	-0.4	-	-	2
Specific Conductivity (in-situ)	µS/cm	-	-	-	351.7	170.4	922.2	173.6	336.3	856.4	768	-	-	391.9
pH (in-situ)	pH	6.5 - 9.0	6.0 - 8.5	-	7.74	7.68	7.74	7.03	7.69	7.95	7.78	-	-	7.16
Dissolved Oxygen (in-situ)	mg/L	-	-	-	10.3	10.55	10.46	9.98	10.82	10.36	9.74	-	-	3.05
Turbidity (In-situ)	NTU	-	-	-	6.19	1.8	2.68	1.73	119	12.61	2.73	-	-	0
Dissolved Oxygen (in-situ - Pit only)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-
Colour, True	CU	15	-	5	-	-	-	-	-	-	-	-	-	<5.0
Conductivity	µS/cm	-	-	2	362	181	917	177	338	915	773	<2.0	<2.0	378
Hardness (as CaCO3)	mg/L	-	-	0.5	191	82.6	553	91.2	177	541	438	<0.50	<0.50	195
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.63	7.66	7.87	7.64	7.63	8	7.93	***5.38***	***5.38***	7.83
Total Suspended Solids	mg/L	-	50	3	***53.3***	<3.0	4	4	16.7	50	5.3	<3.0	<3.0	-
Total Dissolved Solids	mg/L	-	-	1	226	105	638	99	211	644	525	<1.0	<1.0	217
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	60.8	51.8	142	56.2	52.9	148	123	<1.0	<1.0	-
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	60.8	51.8	142	56.2	52.9	148	123	<1.0	<1.0	182
Ammonia, Total (as N)	mg/L	0.75	-	0.005	0.122	0.0097	0.0454	0.0072	0.0611	0.437	0.524	<0.0050	0.0368	-
Chloride (Cl)	mg/L	120	-	0.5	<0.50	0.81	<0.50	<0.50	<0.50	0.53	0.57	<0.50	<0.50	<0.50
Fluoride (F)	mg/L	0.12	-	0.02	0.05	0.036	0.069	0.044	0.055	0.071	0.067	<0.020	<0.020	0.11
Nitrate (as N)	mg/L	13	-	0.005	0.0929	0.0181	<0.0050	0.0155	0.105	0.0235	0.0347	<0.0050	<0.0050	0.114
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0032	<0.0010	<0.0010	<0.0010
Sulfate (SO4)	mg/L	-	-	0.5	114	31	357	29.8	108	357	287	<0.30	<0.30	36.3
Anion Sum	meq/L	-	-	-	3.6	1.71	10.3	1.75	3.32	10.4	8.45	<0.10	<0.10	4.41
Cation Sum	meq/L	-	-	-	4.07	2	11.5	1.97	3.79	11.4	9.33	<0.10	<0.10	4.14
Cation - Anion Balance	%	-	-	-	6.1	7.9	5.5	6.1	6.6	4.4	5	0	0	-3.1
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<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	<0.0050	<0.0050	<0.0050	<0.0050	-
Cyanate	mg/L	-	-	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<2.0	<0.20	<0.20	<0.20	-
Thiocyanate (SCN)	mg/L	-	-	0.5	0.87	0.88	0.85	0.79	0.82	0.89	0.86	<0.50	<0.50	-
Aluminum (Al)-Total	mg/L	0.1	-	0.003	***1.68***	0.031	***0.193***	***0.182***	***1.42***	***0.635***	0.0873	<0.0030	<0.0030	<0.010
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.00179	0.00097	0.00137	0.00024	0.00182	0.00136	0.0019	<0.00010	<0.00010	<0.00050
Arsenic (As)-Total	mg/L	0.005	-	0.0001	***0.0176***	***0.0101***	***0.00609***	0.00223	***0.0176***	***0.0144***	***0.0152***	<0.00010	<0.00010	0.00036
Barium (Ba)-Total	mg/L	-	1.0	0.00005	0.0811	0.0149	0.0367	0.0541	0.0687	0.0444	0.0393	<0.000050	<0.000050	0.087
Beryllium (Be)-Total	mg/L	-	-	0.00002	0.000088	<0.000020	<0.000020	<0.000020	0.000082	0.000031	<0.000020	<0.000020	<0.000020	-
Bismuth (Bi)-Total	mg/L	-	-	0.0005	0.000179	<0.000050	<0.000050	<0.000050	0.000139	<0.000050	<0.000050	<0.000050	<0.000050	-
Boron (B)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	0.012	<0.010	<0.010	<0.10
Cadmium (Cd)-Total *(Lab Result)*	mg/L	0.00009	0.02	0.00001	***0.000361***	0.0000359	0.0000752	0.0000463	***0.00425***	0.000155	0.000111	<0.0000050	<0.0000050	<0.00020
Cadmium (Cd)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.000271*	*0.000135*	*0.000370*	*0.000147*	*0.000255*	*0.000370*	*0.000370*	*0.000370*	*0.000370*	*0.000276*
Calcium (Ca)-Total	mg/L	-	-	0.05	54.2	22.1	122	23	49.6	121	105	<0.050	<0.050	44.7
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	0.00162	0.00015	0.00019	0.00026	0.00121	0.00096	0.0002	0.00041	<0.00010	<0.0020
Cobalt (Co)-Total	mg/L	-	-	0.0001	0.0012	<0.00010	0.00044	0.00016	0.00106	0.00124	0.00118	<0.00010	<0.00010	-
Copper (Cu)-Total *(Lab Result)*	mg/L	0.002	0.2	0.0005	***0.00708***	***0.00224***	0.00216	***0.00267***	***0.0134***	0.00313	0.00252	<0.00050	<0.00050	<0.0010
Copper (Cu)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.00400*	*0.00201*	*0.00400*	*0.00219*	*0.00385*	*0.00400*	*0.00400*	*0.00400*	*0.00400*	*0.00400*
Iron (Fe)-Total	mg/L	0.3	1	0.01	***2.83***	0.081	***1.22***	***0.339***	***1.96***	***3.03***	***1.66***	<0.010	<0.010	<0.030
Lead (Pb)-Total *(Lab Result)*	mg/L	0.001	0.1	0.00005	***0.014***	0.000116	0.000167	0.000321	***0.00943***	0.00109	0.00168	<0.000050	<0.000050	0.00055
Lead (Pb)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00005*	*0.00700*	*0.00249*	*0.00700*	*0.00283*	*0.00658*	*0.00700*	*0.00700*	*0.00700*	*0.00700*	*0.00700*
Lithium (Li)-Total	mg/L	-	-	0.0005	0.0011	<0.0010	0.0029	<0.0010	0.0014	0.0031	0.0018	<0.0010	<0.0010	-
Magnesium (Mg)-Total	mg/L	-	-	0.1	11.4	6.05	53.8	7.63	10.6	48.5	38.4	<0.10	<0.10	20.2
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	0.439	0.0175	***0.71***	0.0292	***0.566***	***1.24***	***1.21***	<0.00010	<0.00010	<0.0020
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	0.0000218	0.0000168	0.0000127	0.0000149	0.0000189	0.0000151	0.0000125	<0.0000050	<0.0000050	<0.00020
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	0.000213	<0.000050	0.000167	0.000255	0.0002	0.000262	0.00026	0.000072	<0.000050	-
Nickel (Ni)-Total *(Lab Result)*	mg/L	0.025	0.3	0.0005	0.00208	<0.00050	0.00107	0.00104	0.00216	0.00178	0.00117	<0.00050	<0.00050	-
Nickel (Ni)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.15000*	*0.08265*	*0.15000*	*0.08911*	*0.14751*	*0.15000*	*0.15000*	*0.15000*	*0.15000*	-
Phosphorus (P)-Total	mg/L	-	-	0.05	0.078	0.052	<0.050	<0.050	<0.050	0.068	<0.050	<0.050	<0.050	-
Potassium (K)-Total	mg/L	-	-	0.1	2.48	11.5	3.12	1.44	2.4	3.26	3.26	<0.10	<0.10	0.88
Selenium (Se)-Total	mg/L	0.001	-	0.0001	<0.000050	0.000061	<0.000050	<0.000050	0.000071	0.000038	0.000063	<0.000050	<0.000050	<0.0010
Silicon (Si)-Total	mg/L	-	-	0.05	6.55	5.88	4.82	4.3	6	5.42	4.29	<0.050	<0.050	-
Silver (Ag)-Total	mg/L	0.0001	0.1	0.00001	***0.000147***	0.000027	<0.000010	0.000011	***0.00015***	0.000028	0.000049	<0.000010	<0.000010	-
Sodium (Na)-Total	mg/L	-	-	0.05	2.83	0.791	5.24	2.09	2.62	7.09	7.79	<0.050	<0.050	5.1
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.332	0.0616	0.426	0.179	0.292	0.415	0.338	<0.00020	<0.00020	-
Sulfur (S)-Total	mg/L	-	-	0.5	34.9	10.6	116	9.88	34.7	113	96.1	<0.50	<0.50	-
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	0.000037	<0.000010	<0.000010	<0.000010	0.000037	0.000011	<0.000010	<0.000010	<0.000010	-
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-
Titanium (Ti)-Total	mg/L	-	-	0.0003	0.0419	0.00078	0.00239	0.00339	0.0326	0.0308	0.00122	<0.00030	<0.00030	-
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.00133	0.000023	0.00194	0.000331	0.000809	0.00177	0.00125	<0.000010	<0.000010	0.0018
Vanadium (V)-Total	mg/L	-	-	0.0005	0.00437	<0.00050	0.00059	0.00056	0.00327	0.00239	0.00061	<0.00050	<0.00050	-
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	***0.0338***	0.0055	***0.0333***	0.0068	***0.375***	***0.0392***	***0.0535***	<0.0030	<0.0030	<0.050
Zirconium (Zr)-Total	mg/L	-	-	0.0003	0.00039	<0.00030	<0.00030	<0.00030	0.00038	<0.00030	<0.00030	<0.00030	<0.00030	-
Aluminum (Al)-Dissolved	mg/L	0.1	-	0.001	***0.178***	0.0222	***0.161***	0.0961	***0.172***	***0.113***	0.0712	<0.0010	-	-
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	0.00071	0.00094	0.00137	0.00022	0.00077	0.00121	0.00169	<0.00010	-	-
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	0.00481	***0.0101***	***0.00565***	0.00175	0.00472	***0.00724***	***0.0124***	<0.00010	-	-
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0581	0.0142	0.0365	0.0541	0.0528	0.0372	0.0396	<0.000050	-	-
Beryllium (Be)-Dissolved	mg/L	-	-	0.00002	0.000029	<0.000020	<0.000020	<0.000020	0.000035	<0.000020	<0.000020	<0.000020	-	-
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	-	-
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.010	-	-
Cadmium (Cd)-Dissolved *(Lab Result)*	mg/L	0.00009	-	0.00001	0.000119	0.0000363	0.0000055	0.0000358	***0.00401***	0.0000752	0.0000807	<0.0000050	-	-
Cadmium (Cd)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.000271*	*0.000135*	*0.000370*	*0.000147*	*0.000255*	*0.000370*	*0.000370*	*0.000370*	-	-
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	57.1	22.8	129	23.7	52.6	131	109	<0.050	-	-
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	0.00019	0.00014	0.00012	0.00015	0.00021	0.00013	0.00012	<0.00010	-	-
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	0.00059	<0.00010	0.00043	0.00011	0.0007	0.00103	0.00118	<0.00010	-	-
Copper (Cu)-Dissolved *(Lab Result)*	mg/L	0.002	-	0.0002	0.00325	***0.00218***	0.00196	***0.00254***	***0.00981***	0.00214	0.00238	<0.00020	-	-
Copper (Cu)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00200*	*0.00400*	*0.00201*	*0.00400*	*0.00219*	*0.00385*	*0.00400*	*0.00400*	*0.00400*	-	-
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	***0.46***	0.066	***1.13***	0.216	***0.402***	***1.21***	***1.41***	<0.010	-	-
Lead (Pb)-Dissolved *(Lab Result)*	mg/L	0.001	-	0.00005	0.000673	<0.000050	0.00009	0.000096	0.000897	0.000113	0.000652	<0.000050	-	-
Lead (Pb)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00005*	*0.00700*	*0.00249*	*0.00700*	*0.00283*	*0.00658*	*0.00700*	*0.00700*	*0.00700*	-	-
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	<0.0010	<0.0010	0.0029	<0.0010	<0.0010	0.0028	0.0017	<0.0010	-	-
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	11.7	6.21	55.8	7.78	11.1	52.1	40	<0.10	-	-
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.393	0.0163	0.708	0.0233	0.539	1.26	1.18	<0.00010	-	-
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	0.0000077	0.0000093	0.0000075	0.0000083	0.0000082	<0.0000050	0.0000062	<0.0000050	-	-
Molybdenum (Mo)-Dissolved	mg/L	0.0073	-	0.00005	0.00013	<0.000050	0.000165	0.000252	0.000119	0.000232	0.000235	<0.000050	-	-
Nickel (Ni)-Dissolved *(Lab Result)*	mg/L	0.025	-	0.0005	0.00107	<0.00050	0.00106	0.00103	0.00153	0.00118	0.0012	<0.00050	-	-
Nickel (Ni)-Diss. (Hardness Adjusted Guideline)	*mg/L*			*0.0005*	*0.15000*	*0.08265*	*0.15000*	*0.08911*	*0.14751*	*0.15000*	*0.15000*	*0.15000*	-	-
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	-	-
Potassium (K)-Dissolved	mg/L	-	-	0.1	2.41	11.9	3.26	1.43	2.32	3.5	3.39	<0.10	-	-
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	0.000065	0.00007	0.000055	0.000051	0.00006	0.000061	0.000075	<0.000050	-	-
Silicon (Si)-Dissolved	mg/L	-	-	0.05	4.05	5.93	4.91	4.2	3.92	4.86	4.32	<0.050	-	-
Silver (Ag)-Dissolved	mg/L	0.00025	-	0.00001	0.000016	0.000019	<0.000010	<0.000010	0.000016	<0.000010	0.000021	<0.000010	-	-
Sodium (Na)-Dissolved	mg/L	-	-	0.05	2.87	0.786	5.28	2.1	2.62	7.44	7.7	<0.050	-	-
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.326	0.061	0.433	0.179	0.293	0.425	0.339	<0.00020	-	-
Sulfur (S)-Dissolved	mg/L	-	-	0.5	36.1	10.7	118	9.94	35.5	119	97.3	<0.50	-	-
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	-	-
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	-
Titanium (Ti)-Dissolved	mg/L	-	-	0.0003	0.0033	0.00033	0.00119	0.00096	0.00289	0.00106	0.00096	<0.00030	-	-
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.00112	0.00002	0.00196	0.000309	0.000758	0.0018	0.00125	<0.000010	-	-
Vanadium (V)-Dissolved	mg/L	-	-	0.001	0.00061	<0.00050	<0.00050	<0.00050	0.00052	<0.00050	<0.00050	<0.00050	-	-
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	0.0087	0.0075	***0.0331***	0.006	***0.363***	0.03	0.0233	<0.0010	-	-
Zirconium (Zr)-Dissolved	mg/L	-	-	0.0003	0.00036	<0.00030	<0.00030	<0.00030	0.00032	<0.00030	<0.00030	<0.00030	-	-

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

COLOUR KEY:

Exceeds CCME Guideline

Exceeds MN Effluent Discharge Standards

Exceeds both CCME and MN Standards

Exceeds Hardness Dependent Calculated Guideline (CCME)

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

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

Summary of Water Quality Results for the April 26-28, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1761963-1 WQ-DC-DX 26/04/2016 19:00	L1761963-2 WQ-PC-U 27/04/2016 09:30	L1761963-3 WQ-BC 27/04/2016 15:00	L1761963-4 WQ-PC-D 27/04/2016 10:20	L1761963-5 WQ-DESS-01 28/04/2016 16:25	L1761963-8 WQ-SEEP 28/04/2016 10:00	L1761963-7 WQ-SEEP-R 28/04/2016 10:35	QA/QC WQ-SEEP Replicate Analysis	L1761963-9 WQ-DC-U 28/04/2016 09:15	L1761963-11 WQ-DC-R 28/04/2016 13:15	L1761963-10 WQ-DC-R-R 28/04/2016 13:30	QA/QC WQ-DC-R Replicate Analysis
Temperature (in-situ)	°C	-	-	-	-0.4	-0.4	2.7	-0.3	0.1	2.9	-	-	0.1	-0.1	-0.1	-
Specific Conductivity (in-situ)	µS/cm	-	-	-	76.2	108.4	90.6	111.3	533.9	1265	-	-	697.8	698.5	698.5	-
pH (in-situ)	pH	6.5 - 9.0	6.0 - 8.5	-	7.17	7.05	7.6	7.31	***5.85***	7.06	-	-	7.7	7.49	7.49	-
Dissolved Oxygen (in-situ)	mg/L	-	-	-	10.88	11.03	10.56	11.21	11.13	5.29	-	-	11.11	9.61	9.61	-
Turbidity (In-situ)	NTU	-	-	-	2.06	15.35	439	110	1.03	21.9	-	-	24.4	8.63	8.63	-
Dissolved Oxygen (in-situ - Pit only)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colour, True	CU	15	-	5	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity	µS/cm	-	-	2	80.4	110	110	117	525	1290	1300	1%	708	689	691	0%
Hardness (as CaCO3)	mg/L	-	-	0.5	41.6	55.6	55.4	57.3	277	689	691	0%	384	368	371	1%
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.22	7.13	7.47	7.22	***5.68***	7.52	7.54	0%	7.96	7.88	7.9	0%
Total Suspended Solids	mg/L	-	50	3	8	24	***1060***	***243***	23.3	***60.7***	35.3	53%	11.3	6.7	<3.0	<DL
Total Dissolved Solids	mg/L	-	-	1	45.8	64.1	61.7	67.7	343	876	952	8%	471	453	456	1%
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	22.9	21.1	30.8	22.6	3.6	211	208	1%	105	95	95.7	1%
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<DL	<1.0	<1.0	<1.0	<DL
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<DL	<1.0	<1.0	<1.0	<DL
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	22.9	21.1	30.8	22.6	3.6	211	208	1%	105	95	95.7	1%
Ammonia, Total (as N)	mg/L	0.75	-	0.005	0.0078	0.0784	0.0314	0.091	0.0076	***3.34***	***3.18***	5%	0.4	0.308	0.304	1%
Chloride (Cl)	mg/L	120	-	0.5	<0.50	<0.50	<0.50	<0.50	<0.50	1	1.2	<2xDL	<0.50	0.95	0.72	<2xDL
Fluoride (F)	mg/L	0.12	-	0.02	0.032	0.031	0.051	0.034	0.039	0.066	0.079	<2xDL	0.059	0.059	0.059	<2xDL
Nitrate (as N)	mg/L	13	-	0.005	<0.0050	0.0263	0.0368	0.0312	<0.0050	0.362	0.395	9%	0.042	0.102	0.104	2%
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0111	0.0107	4%	0.0022	0.004	0.0027	<2xDL
Sulfate (SO4)	mg/L	-	-	0.5	13.2	27.5	19.9	29.8	243	447	524	16%	265	256	257	0%
Anion Sum	meq/L	-	-	-	0.73	1	1.03	1.08	5.12	13.6	15.1	-	7.62	7.26	7.29	-
Cation Sum	meq/L	-	-	-	0.96	1.28	1.25	1.3	5.75	16.1	16.2	-	8.15	7.84	7.91	-
Cation - Anion Balance	%	-	-	-	13.5	12.6	9.3	9.6	5.7	8.6	3.2	-	3.4	3.8	4	-
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0053	0.0107	<2xDL	<0.0050	<0.0050	<0.0050	<DL
Cyanide, Total	mg/L	-	0.3	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0493	0.0413	18%	<0.0050	<0.0050	<0.0050	<DL
Cyanate	mg/L	-	-	0.2	<2.0	0.32	0.33	0.37	0.28	<0.20	<0.20	<DL	<0.20	0.21	0.26	<2xDL
Thiocyanate (SCN)	mg/L	-	-	0.5	1.26	1.27	0.69	1.09	1.19	4.26	3.92	8%	0.83	0.64	0.63	<2xDL
Aluminum (Al)-Total	mg/L	0.1	-	0.003	***0.233***	***0.863***	***15.7***	***3.82***	***0.311***	0.0667	0.071	6%	***0.24***	0.067	0.0748	11%
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.00051	0.00076	0.00222	0.00398	0.00016	0.00063	0.00064	2%	0.00153	0.00174	0.00196	12%
Arsenic (As)-Total	mg/L	0.005	-	0.0001	***0.00702***	***0.0082***	***0.0701***	***0.0618***	0.00254	***0.0948***	***0.101***	6%	***0.0102***	***0.0121***	***0.0148***	20%
Barium (Ba)-Total	mg/L	-	1.0	0.00005	0.016	0.0481	0.406	0.12	0.0215	0.0621	0.0633	2%	0.0382	0.0451	0.0435	4%
Beryllium (Be)-Total	mg/L	-	-	0.00002	0.000055	0.00006	0.000639	0.000227	0.00004	<0.0000020	0.000022	<DL	<0.0000020	<0.0000020	<0.0000020	<DL
Bismuth (Bi)-Total	mg/L	-	-	0.0005	<0.000050	0.000061	0.000899	0.00055	<0.000050	<0.000050	<0.000050	<DL	<0.000050	<0.000050	<0.000050	<DL
Boron (B)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	0.044	0.046	<2xDL	0.013	0.013	0.013	<2xDL
Cadmium (Cd)-Total *(Lab Result)*	mg/L	0.00009	0.02	0.00001	0.0000435	***0.000168***	***0.00205***	***0.00133***	***0.00444***	0.000344	0.000363	5%	0.000134	0.000108	0.000154	35%
Cadmium (Cd)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.000077*	*0.000097*	*0.000097*	*0.000100*	*0.000369*	*0.000370*	*0.000370*	-	-	*0.000370*	*0.000370*	*0.000370*	-
Calcium (Ca)-Total	mg/L	-	-	0.05	10.7	15.7	22	18.8	61.6	196	200	2%	92.3	93.6	91.4	2%
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	<0.00050	0.00104	***0.0212***	0.00478	<0.00050	<0.0010	<0.0010	<DL	<0.00050	<0.00050	<0.00050	<DL
Cobalt (Co)-Total	mg/L	-	-	0.0001	0.00014	0.00065	0.0098	0.00264	0.00021	0.00578	0.00603	4%	0.00105	0.00105	0.00105	0%
Copper (Cu)-Total *(Lab Result)*	mg/L	0.002	0.2	0.0005	<0.0050	<0.0050	***0.0352***	***0.0203***	<0.0050	***0.00503***	***0.0054***	7%	<0.0050	0.00226	<0.0050	<DL
Copper (Cu)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.00200*	*0.00200*	*0.00200*	*0.00200*	*0.00400*	*0.00400*	*0.00400*	-	*0.00400*	*0.00400*	*0.00400*	-
Iron (Fe)-Total	mg/L	0.3	1	0.01	***0.314***	***1.35***	***22.8***	***7.03***	0.205	***14.1***	***1.64***	3%	***1.12***	***1.11***	1%
Lead (Pb)-Total *(Lab Result)*	mg/L	0.001	0.1	0.00005	0.000315	***0.0038***	***0.0701***	***0.0416***	0.000102	0.000461	0.000605	27%	0.000799	0.00116	0.00269	79%
Lead (Pb)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00005*	*0.00100*	*0.00100*	*0.00100*	*0.00100*	*0.00700*	*0.00700*	*0.00700*	-	*0.00700*	*0.00700*	*0.00700*	-
Lithium (Li)-Total	mg/L	-	-	0.0005	<0.0010	0.0011	0.0101	0.0029	0.0016	0.0014	0.0015	<2xDL	0.0025	0.0022	0.0021	<2xDL
Magnesium (Mg)-Total	mg/L	-	-	0.1	3.12	3.59	8.14	4.79	28.4	44.8	45.4	1%	32.2	31	29.9	4%
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	0.0109	0.215	***1.36***	0.424	0.226	***4.91***	***5.09***	4%	***0.986***	***0.976***	***0.974***	0%
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	0.0000257	0.0000246	***0.000097***	***0.000065***	0.0000216	0.0000102	0.0000129	<2xDL	0.0000174	0.0000164	0.0000156	<2xDL
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	0.000051	0.000107	0.0012	0.000259	<0.000050	0.000874	0.000908	4%	0.000245	0.000268	0.000272	1%
Nickel (Ni)-Total *(Lab Result)*	mg/L	0.025	0.3	0.0005	0.00058	0.00242	0.0147	0.00436	0.0039	0.0026	0.00274	5%	0.00138	0.00115	0.00117	<2xDL
Nickel (Ni)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.02500*	*0.02500*	*0.02500*	*0.02500*	*0.15000*	*0.15000*	*0.15000*	*0.02500*	*0.15000*	*0.15000*	*0.15000*	*0.02500*
Phosphorus (P)-Total	mg/L	-	-	0.05	0.062	0.052	0.861	0.227	<0.050	<0.050	<0.050	<DL	<0.050	<0.050	<0.050	<DL
Potassium (K)-Total	mg/L	-	-	0.1	3.3	1.43	3.39	1.96	2.16	4.94	5.13	4%	2.73	2.99	2.96	1%
Selenium (Se)-Total	mg/L	0.001	-	0.0001	0.000053	<0.000050	0.00022	0.000088	<0.000050	0.000227	0.000208	<2xDL	0.00007	0.000087	0.000077	<2xDL
Silicon (Si)-Total	mg/L	-	-	0.05	2.46	3.38	26.5	8.09	3	6.38	6.5	2%	3.51	3.34	3.27	2%
Silver (Ag)-Total	mg/L	0.00025	0.1	0.00001	0.000027	0.000065	***0.000747***	***0.000505***	0.000012	0.000056	0.000077	32%	0.000024	0.000039	0.000054	32%
Sodium (Na)-Total	mg/L	-	-	0.05	0.564	1.2	2.32	1.41	1.22	26.1	26.7	2%	5.39	6.95	6.72	3%
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.0362	0.104	0.168	0.126	0.163	0.592	0.604	2%	0.306	0.297	0.286	4%
Sulfur (S)-Total	mg/L	-	-	0.5	4.46	9.06	6.81	10.2	83.8	179	183	2%	88.5	89.6	86.4	4%
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	<0.00010	0.000016	0.000233	0.000089	<0.000010	<0.000010	<0.000010	<DL	<0.000010	<0.000010	<0.000010	<DL
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	<0.00010	0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<DL	<0.00010	<0.00010	<0.00010	<DL
Titanium (Ti)-Total	mg/L	-	-	0.0003	0.00859	0.02	0.496	0.114	0.00207	0.00196	0.00205	4%	0.00639	0.00116	0.0015	26%
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.000031	0.000277	0.00249	0.000789	0.000015	0.00165	0.00162	2%	0.00128	0.00113	0.00108	5%
Vanadium (V)-Total	mg/L	-	-	0.0005	0.00149	0.00263	0.0454	0.0114	0.00156	0.00329	0.00334	2%	0.00209	0.00231	0.00222	<2xDL
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	0.0049	0.0197	***0.173***	***0.121***	***1.65***	***0.0332***	0.0289	14%	0.0199	0.0144	0.018	22%
Zirconium (Zr)-Total	mg/L	-	-	0.0003	<0.00030	<0.00030	0.00167	0.00051	<0.00030	0.0006	0.00061	<2xDL	<0.00030	<0.00030	<0.00030	<DL
Aluminum (Al)-Dissolved	mg/L	0.1	-	0.001	***0.116***	***0.343***	***0.186***	***0.313***	***0.27***	0.0337	0.0361	7%	***0.133***	0.0517	0.0516	0%
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	0.00041	0.00041	0.00029	0.00055	0.0001	0.00049	0.00048	<2xDL	0.00145	0.00158	0.0016	1%
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	0.00429	0.00391	0.00243	0.00408	0.00195	***0.0661***	***0.0682***	3%	***0.00826***	***0.00836***	***0.00949***	6%
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.0137	0.0402	0.0444	0.0386	0.0205	0.0577	0.0599	4%	0.0369	0.0435	0.0438	1%
Beryllium (Be)-Dissolved	mg/L	-	-	0.00002	<0.000020	0.000052	0.000036	0.000042	0.000039	<0.000020	<0.000020	<DL	<0.000020	<0.000020	<0.000020	<DL
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<DL	<0.000050	<0.000050	<0.000050	<DL
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	0.043	0.043	<2xDL	0.012	0.013	0.013	<2xDL
Cadmium (Cd)-Dissolved *(Lab Result)*	mg/L	0.00009	-	0.00001	0.0000371	0.0000854	***0.000137***	***0.000288***	***0.00438***	0.000205	0.000205	0%	0.000109	0.0000886	0.000111	22%
Cadmium (Cd)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.000077*	*0.000097*	*0.000097*	*0.000100*	*0.000369*	*0.000370*	*0.000370*	-	*0.000370*	*0.000370*	*0.000370*	-
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	11.3	16.3	16.2	16.8	63.2	201	201	0%	97.9	95.6	96.5	1%
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	0.00023	0.00027	0.00017	0.00025	0.0002	0.00046	0.00035	<2xDL	0.00016	0.00016	0.00016	<2xDL
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	<0.00010	0.00042	0.00039	0.00045	0.00019	0.00578	0.00576	0%	0.00101	0.00101	0.00105	4%
Copper (Cu)-Dissolved *(Lab Result)*	mg/L	0.002	-	0.0002	***0.0021***	***0.00315***	***0.00452***	***0.00519***	0.00262	0.00247	0.0028	13%	0.00221	0.002	0.00202	1%
Copper (Cu)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00200*	*0.00200*	*0.00200*	*0.00200*	*0.00200*	*0.00400*	*0.00400*	*0.00400*	-	*0.00400*	*0.00400*	*0.00400*	-
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	0.109	***0.47***	***0.342***	***0.443***	0.155	***12***	***12.1***	1%	***1.38***	***0.865***	***0.857***	1%
Lead (Pb)-Dissolved *(Lab Result)*	mg/L	0.001	-	0.00005	0.000067	0.000429	0.000673	0.001	0.00006	<0.000050	0.00006	<DL	0.000265	0.000376	0.000422	12%
Lead (Pb)-Diss. (Hardness Adjusted Guideline)	*mg/L*			*0.00005*	*0.00100*	*0.00100*	*0.00100*	*0.00100*	*0.00700*	*0.00700*	*0.00700*		*0.00700*	*0.00700*	*0.00700*	
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	<0.0010	<0.0010	<0.0010	<0.0010	0.0017	0.0014	0.0014	<2xDL	0.0026	0.0023	0.0022	<2xDL
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	3.26	3.62	3.66	3.74	29	45.7	45.8	0%	34	31.4	31.7	1%
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.00859	0.203	0.224	0.22	0.221	4.99	4.93	1%	1.01	0.957	0.995	4%
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	0.0000222	0.0000211	0.0000171	0.0000194	0.0000163	0.0000123	0.0000129	<2xDL	0.0000013	0.0000101	0.0000093	<2xDL
Molybdenum (Mo)-Dissolved	mg/L	0.0073	-	0.00005	<0.000050	0.000079	0.000463	0.000081	<0.000050	0.000857	0.000859	0%	0.000236	0.000244	0.000267	9%
Nickel (Ni)-Dissolved *(Lab Result)*	mg/L	0.025	-	0.0005	<0.00050	0.00125	0.00121	0.00116	0.00387	0.00239	0.0024	<2xDL	0.00128	0.00109	0.0011	<2xDL
Nickel (Ni)-Diss. (Hardness Adjusted Guideline)	*mg/L*			*0.0005*	*0.02500*	*0.02500*	*0.02500*	*0.02500*	*0.15000*	*0.15000*	*0.15000*		*0.15000*	*0.15000*	*0.15000*	
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<DL	<0.050	<0.050	<0.050	<DL
Potassium (K)-Dissolved	mg/L	-	-	0.1	3.46	1.37	1.26	1.35	2.15	4.98	5	0%	2.84	2.92	2.96	1%
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	0.000053	0.000053	0.00006	0.00006	0.00006	0.000213	0.000228	<2xDL	0.00007	0.000061	0.000088	<2xDL
Silicon (Si)-Dissolved	mg/L	-	-	0.05	2.44	2.63	2.98	2.63	3	6.37	6.39	0%	3.52	3.32	3.38	2%
Silver (Ag)-Dissolved	mg/L	0.0001	-	0.00001	0.000022	0.000017	0.000019	0.000019	<0.000010	<0.000010	0.000012	<DL	0.00001	0.000014	0.000013	<2xDL
Sodium (Na)-Dissolved	mg/L	-	-	0.05	0.577	1.43	1.31	1.19	1.23	26.8	26.9	0%	5.64	6.89	6.9	0%
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.0364	0.104	0.1	0.105	0.163	0.595	0.599	1%	0.315	0.295	0.295	0%
Sulfur (S)-Dissolved	mg/L	-	-	0.5	4.65	9.43	6.82	9.95	84.5	178	179	1%	91.7	89.4	90.3	1%
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<DL	<0.00010	<0.00010	<0.00010	<DL
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<DL	<0.00010	0.00043	<0.00010	<DL
Titanium (Ti)-Dissolved	mg/L	-	-	0.0003	0.00189	0.00275	0.00319	0.00277	0.00082	0.001	0.00108	<2xDL	0.00112	0.00073	0.00078	<2xDL
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.000023	0.000208	0.000449	0.000209	0.000012	0.0016	0.0016	0%	0.00133	0.00111	0.00111	0%
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.00050	<0.00050	0.00062	<0.00050	<0.00050	0.00169	0.00179	<2xDL	0.00078	0.00073	0.00076	<2xDL
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	0.0036	0.0122	0.0049	***0.0356***	***1.68***	0.0263	0.027	3%	0.0181	0.0138	0.0159	14%
Zirconium (Zr)-Dissolved	mg/L	-	-	0.0003	<0.00030	0.00038	0.00038	0.00049	<0.00030	0.00061	0.00061	<2xDL	<0.00030	<0.00030	<0.00030	<DL

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

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

Notes:

QA/QC Comments: The **Travel Blank** sample did not have any parameters above detection limit. No contamination from storage or transport is suspected.
The **Field Blank** did not have any parameters above detection limits. No contamination from field sampling methodology is suspected.
QA/QC Replicate Analysis - the average RPD of the replicate sample WQ-SEEP-r was 5% with an average difference of 6% for total and 2% for dissolved metals.
The average RPD of the replicate sample WQ-DC-R-r was 7% with an average difference of 12% for total and 4% for dissolved metals.
Total Arsenic, Cadmium, Lead, Silver, Titanium and Zinc had RPD>20% (indicating intrinsically high sample variability).

See methodology document for details on QA/QC methods.

Summary of Water Quality Results for the April 26-28, 2016 Trip.

Analyte	Units	CCME-WATER-F-AL	Mount Nansen Effluent Discharge Standards	Sample ID WQ Site ID Date Sampled Detection Limit	L1761963-12 WQ-NW-SEEP-02 28/04/2016 17:30	L1761963-13 WQ-VC-DBC 27/04/2016 12:55	L1761963-14 WQ-DC-DX+105 26/04/2016 18:35	L1761963-15 WQ-VC-R+150 27/04/2016 18:20	L1761963-16 WQ-VC-UMN 27/04/2016 19:15	L1761963-18 WQ-DC-D1B 28/04/2016 16:00	L1761963-19 WQ-CH-P-13-01 28/04/2016 16:45	L1761963-20 WQ-VC-U 27/04/2016 14:25	L1761963-21 WQ-TP 28/04/2016 11:40	L1761963-22 WQ-DC-B 28/04/2016 11:30	L1761963-6 FIELD BLANK 28/04/2016 19:40	L1761963-17 TRAVEL BLANK	L1761985-1 WQ-PW 28/04/2016 19:45
Temperature (in-situ)	°C	-	-	-	3	0.5	0.8	-0.1	-0.2	0.1	0.1	0.8	3.9	0.1	-	-	0.8
Specific Conductivity (in-situ)	µS/cm	-	-	-	271.9	69.9	112.5	98.3	112.5	465.2	990	69.9	1481	679	-	-	382.9
pH (in-situ)	pH	6.5 - 9.0	6.0 - 8.5	-	***6.26***	7.35	6.96	7.22	7.44	7.89	***5.03***	7.34	7.51	7.75	-	-	7.23
Dissolved Oxygen (in-situ)	mg/L	-	-	-	9.35	11.01	10.44	11.16	10.95	10.86	11.01	10.84	5.85	10.48	-	-	2.15
Turbidity (In-situ)	NTU	-	-	-	25.9	337	4.5	164	151	2.52	5.13	348	17.48	7	-	-	0
Dissolved Oxygen (in-situ - Pit only)	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colour, True	CU	15	-	5	-	-	-	-	-	-	-	-	-	-	-	-	<5.0
Conductivity	µS/cm	-	-	2	455	78.7	113	100	115	457	960	72.3	326	694	<2.0	<2.0	383
Hardness (as CaCO3)	mg/L	-	-	0.5	226	42.2	52.7	50.1	56.3	239	544	38.4	168	384	<0.50	<0.50	203
pH (lab)	pH	6.5 - 9.0	6.0 - 8.5	0.1	7.43	7.46	7.11	7.51	7.56	7.97	***4.99***	7.45	7.4	7.93	***5.43***	***5.32***	8.23
Total Suspended Solids	mg/L	-	50	3	28	***717***	34	***174***	***268***	3.3	<3.0	***460***	30	17.3	<3.0	<3.0	-
Total Dissolved Solids	mg/L	-	-	1	291	43.1	63	55.6	63.6	285	696	38.7	207	458	<1.0	<1.0	213
Alkalinity, Bicarbonate (as CaCO3)	mg/L	-	-	1	22.7	31.3	15.3	32	35.1	83.6	<1.0	29.9	16.3	98.5	<1.0	<1.0	-
Alkalinity, Carbonate (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Alkalinity, Hydroxide (as CaCO3)	mg/L	-	-	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-
Alkalinity, Total (as CaCO3)	mg/L	-	-	1	22.7	31.3	15.3	32	35.1	83.6	<1.0	29.9	16.3	98.5	<1.0	<1.0	171
Ammonia, Total (as N)	mg/L	0.75	-	0.005	0.0094	0.0173	0.0065	0.0119	0.0136	0.0157	0.0098	0.0163	0.0645	0.0347	<0.0050	<0.0050	-
Chloride (Cl)	mg/L	120	-	0.5	1.1	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride (F)	mg/L	0.12	-	0.02	0.109	0.042	0.037	0.041	0.041	0.087	0.051	0.042	0.059	0.055	<0.020	<0.020	0.105
Nitrate (as N)	mg/L	13	-	0.005	0.0775	0.0287	<0.0050	0.0207	0.0289	<0.0050	0.011	0.0257	0.0496	0.0149	<0.0050	<0.0050	0.115
Nitrite (as N)	mg/L	0.06	-	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Sulfate (SO4)	mg/L	-	-	0.5	191	6.87	30.8	16.1	19.9	145	509	4.78	129	261	<0.30	<0.30	36.2
Anion Sum	meq/L	-	-	-	4.47	0.77	0.95	0.98	1.12	4.7	10.6	0.7	3.01	7.4	<0.10	<0.10	4.19
Cation Sum	meq/L	-	-	-	4.57	0.95	1.19	1.12	1.24	4.97	11.2	0.87	3.53	7.99	<0.10	<0.10	4.29
Cation - Anion Balance	%	-	-	-	1.1	10.3	11.3	6.6	5.2	2.8	2.8	10.8	7.9	3.8	0	0	1.2
Cyanide, Weak Acid Diss	mg/L	-	0.1	0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<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	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-
Cyanate	mg/L	-	-	0.2	<0.20	0.44	<0.20	0.2	<0.20	<0.20	<0.20	0.26	<0.20	0.21	<0.20	<0.20	-
Thiocyanate (SCN)	mg/L	-	-	0.5	<0.50	0.67	1.01	0.62	0.62	0.65	0.98	0.61	<0.50	0.73	<0.50	<0.50	-
Aluminum (Al)-Total	mg/L	0.1	-	0.003	***0.34***	***17.3***	***0.224***	***6.26***	***5.46***	0.05	***0.302***	***18.6***	***0.136***	***0.329***	<0.0030	<0.0030	<0.010
Antimony (Sb)-Total	mg/L	-	0.15	0.0001	0.00238	0.00088	0.00213	0.00089	0.00084	0.00506	0.0001	0.00083	0.0145	0.00178	<0.00010	<0.00010	<0.00050
Arsenic (As)-Total	mg/L	0.005	-	0.0001	***0.0213***	***0.0217***	***0.0166***	***0.0157***	***0.0151***	***0.0245***	0.0021	***0.0169***	***0.0539***	***0.00935***	<0.00010	<0.00010	0.00042
Barium (Ba)-Total	mg/L	-	1.0	0.00005	0.0132	0.444	0.0259	0.176	0.165	0.0358	0.019	0.411	0.00708	0.0393	<0.000050	<0.000050	0.087
Beryllium (Be)-Total	mg/L	-	-	0.00002	0.000046	0.00063	0.000029	0.00023	0.000202	<0.000020	0.000041	0.000548	<0.000020	0.000022	<0.000020	<0.000020	-
Bismuth (Bi)-Total	mg/L	-	-	0.0005	0.000183	0.000394	<0.000050	0.000217	0.000181	<0.000050	<0.000050	0.000333	0.000447	<0.000050	<0.000050	<0.000050	-
Boron (B)-Total	mg/L	-	-	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.10
Cadmium (Cd)-Total *(Lab Result)*	mg/L	0.00009	0.02	0.00001	***0.00213***	***0.000543***	***0.00231***	***0.000298***	***0.000283***	***0.000346***	***0.0105***	***0.000332***	***0.00211***	0.000138	<0.0000050	<0.0000050	<0.00020
Cadmium (Cd)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.000312*	*0.000077*	*0.000093*	*0.000089*	*0.000098*	*0.000327*	*0.000370*	*0.000072*	*0.000244*	*0.000370*	*0.000370*	*0.000370*	*0.000285*
Calcium (Ca)-Total	mg/L	-	-	0.05	70.2	18.2	15.3	14.9	16.2	65	111	16.3	88.7	51.7	<0.050	<0.050	47
Chromium (Cr)-Total	mg/L	0.0089	0.04	0.0001	<0.00050	***0.0237***	<0.00050	0.00861	0.00758	<0.00050	<0.00050	***0.0245***	<0.00050	<0.0010	<0.00010	0.00037	<0.0020
Cobalt (Co)-Total	mg/L	-	-	0.0001	0.00024	0.00939	0.00022	0.00327	0.00292	0.00023	<0.00010	0.00916	0.00038	0.00051	<0.00010	<0.00010	-
Copper (Cu)-Total *(Lab Result)*	mg/L	0.002	0.2	0.0005	***0.0507***	***0.0316***	***0.00687***	***0.0133***	***0.0124***	<0.0050	<0.0050	***0.027***	***0.0263***	<0.0050	0.00216	<0.00050	<0.0010
Copper (Cu)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.00400*	*0.00200*	*0.00200*	*0.00200*	*0.00200*	*0.00400*	*0.00400*	*0.00200*	*0.00368*	*0.00400*	*0.00400*	*0.00400*	*0.00400*
Iron (Fe)-Total	mg/L	0.3	1	0.01	***1.07***	***25.2***	***0.324***	***8.98***	***7.65***	0.236	0.075	***25.1***	***0.59***	***1.58***	<0.010	<0.010	<0.030
Lead (Pb)-Total *(Lab Result)*	mg/L	0.001	0.1	0.00005	***0.0129***	***0.0271***	***0.00378***	***0.0132***	***0.0121***	0.00498	<0.000050	***0.0198***	***0.0305***	0.00111	0.000072	<0.000050	0.00059
Lead (Pb)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00005*	*0.00700*	*0.00100*	*0.00100*	*0.00100*	*0.00100*	*0.00700*	*0.00700*	*0.00100*	*0.00616*	*0.00700*	*0.00700*	*0.00700*	*0.00700*
Lithium (Li)-Total	mg/L	-	-	0.0005	0.0015	0.0125	0.0011	0.0048	0.0042	0.003	0.0024	0.0124	0.0015	0.0029	<0.0010	<0.0010	-
Magnesium (Mg)-Total	mg/L	-	-	0.1	10.6	8.58	3.51	5.63	5.98	18.6	57.4	8.26	5.95	34.9	<0.10	<0.10	20.8
Manganese (Mn)-Total	mg/L	-	0.5	0.00005	0.102	***0.562***	0.104	0.313	0.305	0.452	0.466	0.448	***0.513***	0.411	<0.00010	0.00017	<0.0020
Mercury (Hg)-Total	mg/L	0.000026	0.005	0.00001	0.0000111	***0.000094***	0.000024	***0.000053***	0.0000093	0.0000171	0.0000189	***0.000094***	0.0000153	0.0000203	<0.0000050	<0.0000050	<0.00020
Molybdenum (Mo)-Total	mg/L	0.0073	-	0.00005	0.000144	0.00071	0.000057	0.000513	0.000504	0.000167	<0.000050	0.000714	0.000234	0.00018	<0.000050	<0.000050	-
Nickel (Ni)-Total *(Lab Result)*	mg/L	0.025	0.3	0.0005	0.00055	0.0148	0.00131	0.00573	0.00511	0.00082	0.00641	0.0143	0.00107	0.00133	<0.00050	0.00081	-
Nickel (Ni)-Total (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.0005*	*0.15000*	*0.02500*	*0.02500*	*0.02500*	*0.02500*	*0.15000*	*0.15000*	*0.02500*	*0.14177*	*0.15000*	*0.15000*	*0.15000*	*0.15000*
Phosphorus (P)-Total	mg/L	-	-	0.05	0.057	0.984	<0.050	0.261	0.213	<0.050	<0.050	0.843	<0.050	<0.050	<0.050	<0.050	-
Potassium (K)-Total	mg/L	-	-	0.1	1.23	2.7	3.08	1.89	1.77	3.2	2.34	2.78	2.05	2.71	<0.10	<0.10	0.94
Selenium (Se)-Total	mg/L	0.001	-	0.0001	0.000094	0.000257	0.000074	0.000151	0.000119	<0.000050	0.000248	<0.000050	0.000248	0.000068	<0.000050	<0.000050	<0.0010
Silicon (Si)-Total	mg/L	-	-	0.05	1.46	24.5	2.49	11.4	10.1	4	3.09	26.4	0.971	3.65	<0.050	<0.050	-
Silver (Ag)-Total	mg/L	0.00025	0.1	0.00001	***0.00032***	0.000237	0.000119	0.00015	0.000137	0.000093	0.000013	0.00014	***0.00063***	0.000026	<0.000010	<0.000010	-
Sodium (Na)-Total	mg/L	-	-	0.05	0.379	2.06	0.556	1.56	1.6	1.89	1.76	2.24	1.73	3.47	<0.050	<0.050	5
Strontium (Sr)-Total	mg/L	-	-	0.0002	0.141	0.188	0.0424	0.13	0.14	0.165	0.274	0.175	0.118	0.302	<0.00020	<0.00020	-
Sulfur (S)-Total	mg/L	-	-	0.5	63.2	2.7	10.5	5.39	6.67	50.1	166	2.03	45.3	87.8	<0.50	<0.50	-
Thallium (Tl)-Total	mg/L	0.0008	-	0.00001	0.000036	0.000154	0.000017	0.000078	0.000067	<0.000010	<0.000010	0.00016	0.00006	<0.000010	<0.000010	<0.000010	-
Tin (Sn)-Total	mg/L	-	-	0.0001	<0.00010	0.00022	<0.00010	0.00011	<0.00010	<0.00010	<0.00010	0.00024	<0.00010	<0.00010	<0.00010	<0.00010	-
Titanium (Ti)-Total	mg/L	-	-	0.0003	0.00396	0.502	0.00416	0.198	0.168	0.00147	0.00141	0.568	0.0016	0.0122	<0.00030	<0.00030	-
Uranium (U)-Total	mg/L	0.015	-	0.00001	0.000281	0.00251	0.000054	0.000948	0.000898	0.000573	<0.000010	0.00204	0.000143	0.00141	<0.000010	<0.000010	0.00198
Vanadium (V)-Total	mg/L	-	-	0.0005	0.00223	0.054	0.00134	0.019	0.0168	0.00112	0.0017	0.0551	0.00104	0.00246	<0.00050	<0.00050	-
Zinc (Zn)-Total	mg/L	0.03	0.3	0.003	***0.12***	***0.0986***	***0.316***	***0.0398***	***0.0363***	***0.0868***	***3.74***	***0.0785***	***0.241***	0.0227	<0.0030	<0.0030	<0.050
Zirconium (Zr)-Total	mg/L	-	-	0.0003	<0.00030	0.00129	<0.00030	0.00086	0.00065	<0.00030	<0.00030	0.00116	<0.00030	<0.00030	<0.00030	<0.00030	-
Aluminum (Al)-Dissolved	mg/L	0.1	-	0.001	0.0106	***0.154***	***0.142***	***0.125***	***0.116***	0.0259	***0.296***	***0.164***	0.0236	***0.129***	<0.0010	-	-
Antimony (Sb)-Dissolved	mg/L	-	-	0.0001	0.00077	<0.00010	0.00157	0.0002	0.00021	0.00461	<0.00010	<0.00010	0.00108	0.00168	<0.00010	-	-
Arsenic (As)-Dissolved	mg/L	0.005	0.15	0.0001	0.0028	0.00061	***0.00889***	0.0015	0.00161	***0.0199***	0.00162	0.00039	***0.0172***	***0.00714***	<0.00010	-	-
Barium (Ba)-Dissolved	mg/L	-	-	0.00005	0.00829	0.0587	0.0229	0.0556	0.0559	0.0342	0.0195	0.0581	0.00454	0.0345	<0.000050	-	-
Beryllium (Be)-Dissolved	mg/L	-	-	0.00002	<0.000020	0.000033	0.000028	0.000021	<0.000020	<0.000020	0.000039	0.000022	<0.000020	0.000024	<0.000020	-	-
Bismuth (Bi)-Dissolved	mg/L	-	-	0.0005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	-	-
Boron (B)-Dissolved	mg/L	-	-	0.01	<0.010	0.026	<0.010	0.261	0.213	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	-
Cadmium (Cd)-Dissolved *(Lab Result)*	mg/L	0.00009	-	0.00001	***0.0016***	0.0000408	***0.00219***	0.0000445	0.0000428	0.00025	***0.011***	0.0000275	***0.00196***	0.000103	<0.0000050	-	-
Cadmium (Cd)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00001*	*0.000312*	*0.000077*	*0.000093*	*0.000089*	*0.000098*	*0.000327*	*0.000370*	*0.000072*	*0.000244*	*0.000370*	*0.000370*	-	-
Calcium (Ca)-Dissolved	mg/L	-	-	0.05	72.8	11.4	15.4	13.4	14.9	65	118	10.2	56.4	93.4	<0.050	-	-
Chromium (Cr)-Dissolved	mg/L	0.0089	-	0.0001	<0.00010	0.00017	0.00019	0.00022	0.00017	0.00011	0.00015	0.00019	<0.00010	0.00015	<0.00010	-	-
Cobalt (Co)-Dissolved	mg/L	-	-	0.0001	<0.00010	0.00021	0.00018	0.00023	0.00021	0.00021	<0.00010	0.0002	0.00035	0.00043	<0.00010	-	-
Copper (Cu)-Dissolved *(Lab Result)*	mg/L	0.002	-	0.0002	***0.00907***	***0.00362***	***0.00631***	***0.00323***	***0.00313***	0.00312	0.0021	***0.00345***	***0.0204***	0.0022	<0.00020	-	-
Copper (Cu)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00200*	*0.00400*	*0.00200*	*0.00200*	*0.00200*	*0.00200*	*0.00400*	*0.00400*	*0.00200*	*0.00368*	*0.00400*	*0.00400*	-	-
Iron (Fe)-Dissolved	mg/L	0.3	-	0.01	0.021	0.274	0.139	0.299	0.253	0.133	0.059	0.268	0.081	***1.11***	<0.010	-	-
Lead (Pb)-Dissolved *(Lab Result)*	mg/L	0.001	-	0.00005	0.00039	0.000205	0.000859	0.000182	0.000209	0.0014	<0.000050	0.000128	0.00245	0.000322	<0.000050	-	-
Lead (Pb)-Diss. (Hardness Adjusted Guideline)	*mg/L*	-	-	*0.00005*	*0.00700*	*0.00100*	*0.00100*	*0.00100*	*0.00100*	*0.00700*	*0.00700*	*0.00100*	*0.00616*	*0.00700*	*0.00700*	-	-
Lithium (Li)-Dissolved	mg/L	-	-	0.0005	0.0012	<0.0010	0.0011	<0.0010	<0.0010	0.003	0.0025	<0.0010	0.0017	0.0029	<0.0010	-	-
Magnesium (Mg)-Dissolved	mg/L	-	-	0.1	10.7	3.36	3.48	4.06	4.61	18.6	60.7	3.13	6.63	36.7	<0.10	-	-
Manganese (Mn)-Dissolved	mg/L	-	-	0.00005	0.0614	0.0429	0.083	0.0712	0.0669	0.446	0.472	0.0268	0.536	0.403	0.00019	-	-
Mercury (Hg)-Dissolved	mg/L	0.000026	-	0.00001	<0.0000050	0.0000157	0.0000173	0.0000146	0.0000128	0.0000143	0.000013	0.0000156	0.0000062	0.0000117	<0.0000050	-	-
Molybdenum (Mo)-Dissolved	mg/L	0.0073	-	0.00005	0.000125	0.000202	<0.000050	0.000208	0.000228	0.000155	<0.000050	0.000159	0.000237	0.000184	<0.000050	-	-
Nickel (Ni)-Dissolved *(Lab Result)*	mg/L	0.025	-	0.0005	<0.00050	0.00097	0.00116	0.00102	0.00081	0.00071	0.00646	0.00092	0.00079	0.00105	<0.00050	-	-
Nickel (Ni)-Diss. (Hardness Adjusted Guideline)	*mg/L*			*0.0005*	*0.15000*	*0.02500*	*0.02500*	*0.02500*	*0.02500*	*0.15000*	*0.15000*	*0.02500*	*0.14177*	*0.15000*	*0.15000*	-	-
Phosphorus (P)-Dissolved	mg/L	-	-	0.05	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	-	-
Potassium (K)-Dissolved	mg/L	-	-	0.1	1.05	1.06	2.99	1.1	1.09	3.16	2.46	1.03	2.11	2.77	<0.10	-	-
Selenium (Se)-Dissolved	mg/L	0.001	-	0.0001	0.000092	0.000065	0.000064	<0.000050	<0.000050	<0.000050	0.000056	<0.000050	<0.000050	0.00009	<0.000050	-	-
Silicon (Si)-Dissolved	mg/L	-	-	0.05	0.912	2.97	2.36	2.77	2.84	4.01	3.24	2.89	0.83	3.47	<0.050	-	-
Silver (Ag)-Dissolved	mg/L	0.0001	-	0.00001	0.000012	<0.000010	0.000038	0.000012	<0.000010	0.000028	0.00001	<0.000010	***0.00011***	0.000011	<0.000010	-	-
Sodium (Na)-Dissolved	mg/L	-	-	0.05	0.376	1.04	0.549	1.21	1.36	1.88	1.82	0.996	1.84	3.58	<0.050	-	-
Strontium (Sr)-Dissolved	mg/L	-	-	0.0002	0.14	0.107	0.0419	0.109	0.122	0.162	0.289	0.101	0.126	0.312	<0.00020	-	-
Sulfur (S)-Dissolved	mg/L	-	-	0.5	65.4	2.52	10.6	5.57	6.79	50.6	175	1.86	50.3	90.7	<0.50	-	-
Thallium (Tl)-Dissolved	mg/L	0.0008	-	0.00001	0.000011	<0.000010	0.000011	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000051	<0.000010	<0.000010	-	-
Tin (Sn)-Dissolved	mg/L	-	-	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	-
Titanium (Ti)-Dissolved	mg/L	-	-	0.0003	<0.00030	0.00157	0.0016	0.00127	0.00142	0.00069	0.00049	0.00186	<0.00030	0.00108	<0.00030	-	-
Uranium (U)-Dissolved	mg/L	0.015	-	0.00001	0.000238	0.000268	0.000045	0.000243	0.000269	0.000559	<0.000010	0.000236	0.000138	0.00143	<0.000010	-	-
Vanadium (V)-Dissolved	mg/L	-	-	0.001	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00061	<0.00050	-	-
Zinc (Zn)-Dissolved	mg/L	0.03	-	0.001	***0.0703***	0.0028	***0.31***	0.0068	0.0027	***0.0842***	***3.91***	0.002	***0.235***	0.0206	<0.0010	-	-
Zirconium (Zr)-Dissolved	mg/L	-	-	0.0003	<0.00030	<0.00030	<0.00030	0.00038	<0.00030	<0.00030	<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
Exceeds Hardness Dependent Calculated Guideline (CCME)
Data flag for Detection Limit Adjustment --> Please refer to the lab COA report and lab excel report for more info
QA/QC Codes: RPD - Relative Percent Difference, <DL - below detection limit, and <2XDL - less than two times the detection limit.

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ATTACHMENT 5: LABORATORY CERTIFICATES OF ANALYSIS AND YUKON ENVIRONMENTAL HEALTH SERVICES BACTERIOLOGICAL RESULTS

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

Date Received: 20-APR-16
Report Date: 10-MAY-16 09:31 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1758226

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

Can Dang
Senior Account Manager

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1758226-1 WATER 20-APR-16 09:30 WQ-DESS-03	L1758226-2 WATER 20-APR-16 09:50 WQ-DESS-01	L1758226-3 WATER 20-APR-16 09:10 WQ-DC-D1B	L1758226-4 WATER 20-APR-16 10:00 WQ-CH-P-13-01	L1758226-5 WATER 19-APR-16 13:35 WQ-VC-UMN
WATER						
Physical Tests	Conductivity (uS/cm)	45.0	314	798	635	228
	Hardness (as CaCO3) (mg/L)	29.5	163	466	360	123
	pH (pH)	6.11	5.60	7.93	5.02	7.72
	Total Suspended Solids (mg/L)	5.3	<3.0	<3.0	<3.0	<3.0
	Total Dissolved Solids (mg/L)	22.0	194	535	430	131
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	7.7	3.8	150	<1.0	71.3
	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)	7.7	3.8	150	<1.0	71.3
	Ammonia, Total (as N) (mg/L)	0.0070	0.0061	0.0566	0.0066	<0.0050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.031	0.033	0.127	0.040	0.049
	Nitrate (as N) (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	0.0426
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sulfate (SO4) (mg/L)	3.36	131	275	303	41.5
	Anion Sum (meq/L)	0.23	2.81	8.73	6.31	2.30
	Cation Sum (meq/L)	0.72	3.42	9.60	7.43	2.62
	Cation - Anion Balance (%)	52.2	9.9	4.7	8.2	6.7
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanate (mg/L)	<2.0 DLIS	<0.20	<0.20	<0.20	<0.20
	Thiocyanate (SCN) (mg/L)	2.36	1.43	0.61	1.05	0.69
Total Metals	Aluminum (Al)-Total (mg/L)	0.582	0.260	0.0243	0.478	0.120
	Antimony (Sb)-Total (mg/L)	0.00014	<0.00010	0.00634	0.00011	0.00031
	Arsenic (As)-Total (mg/L)	0.00251	0.00192	0.0182	0.00250	0.00298
	Barium (Ba)-Total (mg/L)	0.0421	0.0132	0.0281	0.0167	0.0627
	Beryllium (Be)-Total (mg/L)	0.000033	0.000031	<0.000020	0.000039	<0.000020
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.0000889	0.00200	0.000359	0.00599	0.0000406
	Calcium (Ca)-Total (mg/L)	8.69	39.5	114	78.2	31.6
	Chromium (Cr)-Total (mg/L)	<0.00060 DLB	<0.00030 DLB	<0.00020 DLB	<0.00040 DLB	<0.00030 DLB
	Cobalt (Co)-Total (mg/L)	0.00032	<0.00010	0.00024	0.00020	0.00016
	Copper (Cu)-Total (mg/L)	0.00468	0.00260	0.00307	0.00257	0.00246
	Iron (Fe)-Total (mg/L)	0.544	0.145	0.196	0.420	0.252
	Lead (Pb)-Total (mg/L)	0.000208	0.000070	0.000633	0.000298	0.000390
	Lithium (Li)-Total (mg/L)	<0.0010	<0.0010	0.0045	<0.0010	<0.0010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1758226-6 WATER 19-APR-16 14:50 WQ-SEEP	L1758226-7 WATER 19-APR-16 09:45 WQ-VC-DBC	L1758226-8 WATER 19-APR-16 11:00 WQ-BC	L1758226-9 WATER 19-APR-16 17:55 WQ-DC-DX+105	L1758226-10 WATER 19-APR-16 18:00 WQ-DC-DX+105-R
WATER						
Physical Tests	Conductivity (uS/cm)	1,532.00	169	218	173	172
	Hardness (as CaCO3) (mg/L)	865	89.7	120	84.1	83.5
	pH (pH)	7.01	7.66	7.79	7.24	7.23
	Total Suspended Solids (mg/L)	44.7	4.7	44.0	<3.0	<3.0
	Total Dissolved Solids (mg/L)	1160	91.6	128	103	103
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	251	67.6	63.6	31.3	32.3
	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)	251	67.6	63.6	31.3	32.3
	Ammonia, Total (as N) (mg/L)	3.89	0.0063	0.0092	0.0143	0.0079
	Chloride (Cl) (mg/L)	1.4 DLA	<0.50	<0.50	0.63	0.66
	Fluoride (F) (mg/L)	0.084 DLA	0.047	0.069	0.046	0.047
	Nitrate (as N) (mg/L)	0.381 DLA	0.0640	0.0486	<0.0050	<0.0050
	Nitrite (as N) (mg/L)	0.0219 DLA	<0.0010	<0.0010	<0.0010	<0.0010
	Sulfate (SO4) (mg/L)	634 DLA	16.3	42.5	43.8	43.7
	Anion Sum (meq/L)	18.3	1.70	2.16	1.56	1.58
	Cation Sum (meq/L)	20.2	1.93	2.58	1.96	1.95
	Cation - Anion Balance (%)	5.0	6.4	8.9	11.5	10.5
Cyanides	Cyanide, Weak Acid Diss (mg/L)	0.0159	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	0.0652	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanate (mg/L)	<0.20	0.22	<0.20	<0.20	<0.20
	Thiocyanate (SCN) (mg/L)	4.90	0.63	0.80	0.94	0.97
Total Metals	Aluminum (Al)-Total (mg/L)	0.0436	0.234	1.04	0.269	0.232
	Antimony (Sb)-Total (mg/L)	0.00059	0.00010	0.00044	0.00322	0.00326
	Arsenic (As)-Total (mg/L)	0.110	0.00101	0.00764	0.0210	0.0200
	Barium (Ba)-Total (mg/L)	0.0673	0.0686	0.0689	0.0265	0.0262
	Beryllium (Be)-Total (mg/L)	<0.000020	<0.000020	0.000055	0.000050	0.000045
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	0.000093	<0.000050	<0.000050
	Boron (B)-Total (mg/L)	0.050	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000252	0.0000530	0.000311	0.00280	0.00275
	Calcium (Ca)-Total (mg/L)	258	22.9	32.1	23.6	23.2
	Chromium (Cr)-Total (mg/L)	<0.00090 DLB	<0.00030 DLB	0.00139	<0.00030 DLB	0.00041
	Cobalt (Co)-Total (mg/L)	0.00727	0.00016	0.00070	0.00014	0.00014
	Copper (Cu)-Total (mg/L)	0.00261	0.00266	0.00533	0.0175	0.0174
	Iron (Fe)-Total (mg/L)	19.6	0.353	1.58	0.334	0.311
	Lead (Pb)-Total (mg/L)	0.000451	0.000415	0.00462	0.00579	0.00532
	Lithium (Li)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1758226-11 WATER 19-APR-16 17:15 WQ-TP	L1758226-12 WATER 20-APR-16 10:45 FIELD BLANK	L1758226-13 WATER TRAVEL BLANK	L1758226-14 WATER 20-APR-16 12:00 WQ-VC-U	L1758226-15 WATER 20-APR-16 12:05 WQ-VC-U-R
WATER						
Physical Tests	Conductivity (uS/cm)	537	<2.0	<2.0	162	165
	Hardness (as CaCO3) (mg/L)	286	<0.50	<0.50	85.7	86.2
	pH (pH)	7.67	5.38	5.38	7.69	7.71
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0	24.0	27.3
	Total Dissolved Solids (mg/L)	360	<1.0	<1.0	88.1	89.1
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	31.0	<1.0	<1.0	69.5	70.9
	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)	31.0	<1.0	<1.0	69.5	70.9
	Ammonia, Total (as N) (mg/L)	0.116	<0.0050	0.0368 RRV	<0.0050	<0.0050
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.068	<0.020	<0.020	0.046	0.043
	Nitrate (as N) (mg/L)	0.0765	<0.0050	<0.0050	0.0666	0.0648
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sulfate (SO4) (mg/L)	229	<0.30	<0.30	13.4	13.3
	Anion Sum (meq/L)	5.40	<0.10	<0.10	1.67	1.70
	Cation Sum (meq/L)	5.98	<0.10	<0.10	1.84	1.85
	Cation - Anion Balance (%)	5.1	0.0	0.0	4.8	4.2
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanate (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Thiocyanate (SCN) (mg/L)	<0.50	<0.50	<0.50	0.53	0.53
Total Metals	Aluminum (Al)-Total (mg/L)	0.0057	<0.0030	<0.0030	0.332	0.436
	Antimony (Sb)-Total (mg/L)	0.0102	<0.00010	<0.00010	<0.00010	0.00012
	Arsenic (As)-Total (mg/L)	0.0245	<0.00010	<0.00010	0.00063	0.00074
	Barium (Ba)-Total (mg/L)	0.00588	<0.000050	<0.000050	0.0703	0.0729
	Beryllium (Be)-Total (mg/L)	<0.000020	<0.000020	<0.000020	0.000022	0.000026
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Total (mg/L)	0.016	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000534	<0.0000050	<0.0000050	0.0000284	0.0000264
	Calcium (Ca)-Total (mg/L)	82.9	<0.050	<0.050	20.7	21.0
	Chromium (Cr)-Total (mg/L)	<0.00010	0.00041 RRV	<0.00010	0.00043	0.00075
	Cobalt (Co)-Total (mg/L)	0.00026	<0.00010	<0.00010	0.00020	0.00024
	Copper (Cu)-Total (mg/L)	0.0102	<0.00050	<0.00050	0.00254	0.00288
	Iron (Fe)-Total (mg/L)	0.038	<0.010	<0.010	0.543	0.642
	Lead (Pb)-Total (mg/L)	0.000424	<0.000050	<0.000050	0.000341	0.000419
	Lithium (Li)-Total (mg/L)	0.0011	<0.0010	<0.0010	<0.0010	<0.0010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1758226-16 WATER 19-APR-16 16:40 WQ-PC-U	L1758226-17 WATER 19-APR-16 18:15 WQ-DC-DX	L1758226-18 WATER 19-APR-16 15:45 WQ-DC-B	L1758226-19 WATER 18-APR-16 14:00 WQ-VC-R+150	L1758226-20 WATER 19-APR-16 17:00 WQ-PC-D
WATER						
Physical Tests	Conductivity (uS/cm)	362	181	917	177	338
	Hardness (as CaCO3) (mg/L)	191	82.6	553	91.2	177
	pH (pH)	7.63	7.66	7.87	7.64	7.63
	Total Suspended Solids (mg/L)	53.3	<3.0	4.0	4.0	16.7
	Total Dissolved Solids (mg/L)	226	105	638	99.0	211
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	60.8	51.8	142	56.2	52.9
	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)	60.8	51.8	142	56.2	52.9
	Ammonia, Total (as N) (mg/L)	0.122	0.0097	0.0454	0.0072	0.0611
	Chloride (Cl) (mg/L)	<0.50	0.81	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.050	0.036	0.069	0.044	0.055
	Nitrate (as N) (mg/L)	0.0929	0.0181	<0.0050	0.0155	0.105
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sulfate (SO4) (mg/L)	114	31.0	357	29.8	108
	Anion Sum (meq/L)	3.60	1.71	10.3	1.75	3.32
	Cation Sum (meq/L)	4.07	2.00	11.5	1.97	3.79
	Cation - Anion Balance (%)	6.1	7.9	5.5	6.1	6.6
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanate (mg/L)	<0.20	<0.20	<0.20	<0.20	<0.20
	Thiocyanate (SCN) (mg/L)	0.87	0.88	0.85	0.79	0.82
Total Metals	Aluminum (Al)-Total (mg/L)	1.68	0.0310	0.193	0.182	1.42
	Antimony (Sb)-Total (mg/L)	0.00179	0.00097	0.00137	0.00024	0.00182
	Arsenic (As)-Total (mg/L)	0.0176	0.0101	0.00609	0.00223	0.0176
	Barium (Ba)-Total (mg/L)	0.0811	0.0149	0.0367	0.0541	0.0687
	Beryllium (Be)-Total (mg/L)	0.000088	<0.000020	<0.000020	<0.000020	0.000082
	Bismuth (Bi)-Total (mg/L)	0.000179	<0.000050	<0.000050	<0.000050	0.000139
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000361	0.0000359	0.0000752	0.0000463	0.00425
	Calcium (Ca)-Total (mg/L)	54.2	22.1	122	23.0	49.6
	Chromium (Cr)-Total (mg/L)	0.00162	0.00015	0.00019	0.00026	0.00121
	Cobalt (Co)-Total (mg/L)	0.00120	<0.00010	0.00044	0.00016	0.00106
	Copper (Cu)-Total (mg/L)	0.00708	0.00224	0.00216	0.00267	0.0134
	Iron (Fe)-Total (mg/L)	2.83	0.081	1.22	0.339	1.96
	Lead (Pb)-Total (mg/L)	0.0140	0.000116	0.000167	0.000321	0.00943
	Lithium (Li)-Total (mg/L)	0.0011	<0.0010	0.0029	<0.0010	0.0014

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1758226-21	L1758226-22			
	Description	WATER	WATER			
	Sampled Date	18-APR-16	18-APR-16			
	Sampled Time	17:30	16:00			
	Client ID	WQ-DC-U	WQ-DC-R			
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	915	773			
	Hardness (as CaCO3) (mg/L)	541	438			
	pH (pH)	8.00	7.93			
	Total Suspended Solids (mg/L)	50.0	5.3			
	Total Dissolved Solids (mg/L)	644	525			
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	148	123			
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0			
	Alkalinity, Total (as CaCO3) (mg/L)	148	123			
	Ammonia, Total (as N) (mg/L)	0.437	0.524			
	Chloride (Cl) (mg/L)	0.53	0.57			
	Fluoride (F) (mg/L)	0.071	0.067			
	Nitrate (as N) (mg/L)	0.0235	0.0347			
	Nitrite (as N) (mg/L)	<0.0010	0.0032			
	Sulfate (SO4) (mg/L)	357	287			
	Anion Sum (meq/L)	10.4	8.45			
	Cation Sum (meq/L)	11.4	9.33			
	Cation - Anion Balance (%)	4.4	5.0			
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050			
	Cyanide, Total (mg/L)	<0.0050	<0.0050			
	Cyanate (mg/L)	<2.0 DLIS	<0.20			
	Thiocyanate (SCN) (mg/L)	0.89	0.86			
Total Metals	Aluminum (Al)-Total (mg/L)	0.635	0.0873			
	Antimony (Sb)-Total (mg/L)	0.00136	0.00190			
	Arsenic (As)-Total (mg/L)	0.0144	0.0152			
	Barium (Ba)-Total (mg/L)	0.0444	0.0393			
	Beryllium (Be)-Total (mg/L)	0.000031	<0.000020			
	Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050			
	Boron (B)-Total (mg/L)	0.011	0.012			
	Cadmium (Cd)-Total (mg/L)	0.000155	0.000111			
	Calcium (Ca)-Total (mg/L)	121	105			
	Chromium (Cr)-Total (mg/L)	0.00096	0.00020			
	Cobalt (Co)-Total (mg/L)	0.00124	0.00118			
	Copper (Cu)-Total (mg/L)	0.00313	0.00252			
	Iron (Fe)-Total (mg/L)	3.03	1.66			
	Lead (Pb)-Total (mg/L)	0.00109	0.00168			
	Lithium (Li)-Total (mg/L)	0.0031	0.0018			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1758226-1	L1758226-2	L1758226-3	L1758226-4	L1758226-5
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	20-APR-16	20-APR-16	20-APR-16	20-APR-16	19-APR-16
	Sampled Time	09:30	09:50	09:10	10:00	13:35
	Client ID	WQ-DESS-03	WQ-DESS-01	WQ-DC-D1B	WQ-CH-P-13-01	WQ-VC-UMN
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	1.72	13.7	37.4	34.1	10.1
	Manganese (Mn)-Total (mg/L)	0.0379	0.0565	0.685	0.406	0.0476
	Mercury (Hg)-Total (mg/L)	0.0000268	0.0000200	0.0000076	0.0000183	0.0000094
	Molybdenum (Mo)-Total (mg/L)	<0.000050	<0.000050	<0.00025 DLB	<0.000050	<0.00035 DLB
	Nickel (Ni)-Total (mg/L)	0.00169	0.00260	0.00093	0.00407	0.00079
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	2.02	2.27	3.88	2.64	1.33
	Selenium (Se)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Silicon (Si)-Total (mg/L)	2.64	2.78	5.64	3.06	4.97
	Silver (Ag)-Total (mg/L)	0.000019	<0.000010	0.000024	0.000019	0.000011
	Sodium (Na)-Total (mg/L)	0.645	0.895	3.24	1.40	2.62
	Strontium (Sr)-Total (mg/L)	0.0402	0.103	0.278	0.202	0.236
	Sulfur (S)-Total (mg/L)	1.49	43.9	91.1	102	14.3
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	0.000014	<0.000010	<0.000010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	0.00956	0.00165	0.00050	0.00492	0.00230
	Uranium (U)-Total (mg/L)	0.000031	<0.000010	0.00151	0.000019	0.000535
	Vanadium (V)-Total (mg/L)	0.00115	<0.00050	<0.00050	0.00075	<0.00050
	Zinc (Zn)-Total (mg/L)	0.0127	0.814	0.171	1.94	0.0053
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.319	0.245	0.0202	0.284	0.0563
	Antimony (Sb)-Dissolved (mg/L)	<0.00010	<0.00010	0.00645	<0.00010	0.00028
	Arsenic (As)-Dissolved (mg/L)	0.00156	0.00179	0.0178	0.00156	0.00247
	Barium (Ba)-Dissolved (mg/L)	0.0381	0.0136	0.0273	0.0131	0.0609
	Beryllium (Be)-Dissolved (mg/L)	0.000026	0.000030	<0.000020	0.000033	<0.000020
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.0000723	0.00212	0.000272	0.00559	0.0000472
	Calcium (Ca)-Dissolved (mg/L)	8.94	41.7	122	84.7	32.2
	Chromium (Cr)-Dissolved (mg/L)	0.00024	0.00018	<0.00010	0.00013	0.00011
	Cobalt (Co)-Dissolved (mg/L)	<0.00010	<0.00010	0.00022	<0.00010	0.00012
	Copper (Cu)-Dissolved (mg/L)	0.00386	0.00249	0.00269	0.00213	0.00225
	Iron (Fe)-Dissolved (mg/L)	0.136	0.111	0.185	0.062	0.159
	Lead (Pb)-Dissolved (mg/L)	<0.000050	0.000073	0.000326	<0.000050	0.000112
	Lithium (Li)-Dissolved (mg/L)	<0.0010	<0.0010	0.0044	<0.0010	<0.0010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1758226-6 WATER 19-APR-16 14:50 WQ-SEEP	L1758226-7 WATER 19-APR-16 09:45 WQ-VC-DBC	L1758226-8 WATER 19-APR-16 11:00 WQ-BC	L1758226-9 WATER 19-APR-16 17:55 WQ-DC-DX+105	L1758226-10 WATER 19-APR-16 18:00 WQ-DC-DX+105-R
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	57.3	7.49	7.85	5.31	5.23
	Manganese (Mn)-Total (mg/L)	6.18	0.0690	0.362	0.0483	0.0479
	Mercury (Hg)-Total (mg/L)	0.0000092	0.0000116	0.0000165	0.0000198	0.0000185
	Molybdenum (Mo)-Total (mg/L)	0.00106	<0.00040 DLB	0.000769	<0.00010 DLB	0.000093
	Nickel (Ni)-Total (mg/L)	0.00290	0.00082	0.00166	0.00161	0.00166
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	0.053	0.056	0.064
	Potassium (K)-Total (mg/L)	6.12	1.19	1.54	7.70	7.53
	Selenium (Se)-Total (mg/L)	0.000259	<0.000050	0.000056	0.000093	0.000058
	Silicon (Si)-Total (mg/L)	8.18	5.14	6.26	5.17	5.01
	Silver (Ag)-Total (mg/L)	0.000040	<0.000010	0.000082	0.000131	0.000117
	Sodium (Na)-Total (mg/L)	34.7	2.07	2.31	0.764	0.769
	Strontium (Sr)-Total (mg/L)	0.753	0.231	0.209	0.0572	0.0558
	Sulfur (S)-Total (mg/L)	228	5.71	13.7	14.9	14.7
	Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	0.000020	0.000015	0.000013
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	0.00230	0.00558	0.0309	0.00323	0.00262
	Uranium (U)-Total (mg/L)	0.00164	0.000542	0.00109	0.000082	0.000080
	Vanadium (V)-Total (mg/L)	0.00317	0.00072	0.00274	0.00058	0.00057
	Zinc (Zn)-Total (mg/L)	0.0291	0.0036	0.0153	0.357	0.341
	Zirconium (Zr)-Total (mg/L)	0.00072	<0.00030	0.00046	<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)	0.0152	0.0734	0.118	0.186	0.192
	Antimony (Sb)-Dissolved (mg/L)	0.00046	<0.00010	0.00020	0.00238	0.00239
	Arsenic (As)-Dissolved (mg/L)	0.0809	0.00055	0.00216	0.0134	0.0135
	Barium (Ba)-Dissolved (mg/L)	0.0626	0.0641	0.0563	0.0246	0.0261
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020	0.000023	0.000045	0.000046
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)	0.045	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.000183	0.0000414	0.000199	0.00262	0.00276
	Calcium (Ca)-Dissolved (mg/L)	254	23.3	34.5	24.6	24.5
	Chromium (Cr)-Dissolved (mg/L)	0.00043	0.00013	0.00017	0.00019	0.00022
	Cobalt (Co)-Dissolved (mg/L)	0.00654	<0.00010	0.00028	0.00011	0.00012
	Copper (Cu)-Dissolved (mg/L)	0.00137	0.00237	0.00384	0.0166	0.0180
	Iron (Fe)-Dissolved (mg/L)	17.3	0.159	0.232	0.182	0.179
	Lead (Pb)-Dissolved (mg/L)	<0.000050	0.000063	0.000346	0.00188	0.00204
	Lithium (Li)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1758226-11 WATER 19-APR-16 17:15 WQ-TP	L1758226-12 WATER 20-APR-16 10:45 FIELD BLANK	L1758226-13 WATER TRAVEL BLANK	L1758226-14 WATER 20-APR-16 12:00 WQ-VC-U	L1758226-15 WATER 20-APR-16 12:05 WQ-VC-U-R
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	14.6	<0.10	<0.10	7.16	7.21
	Manganese (Mn)-Total (mg/L)	0.237	<0.00010	<0.00010	0.0381	0.0414
	Mercury (Hg)-Total (mg/L)	<0.0000050	<0.0000050	<0.0000050	0.0000102	0.0000103
	Molybdenum (Mo)-Total (mg/L)	0.000385	0.000072 RRV	<0.000050	0.000305	0.000376
	Nickel (Ni)-Total (mg/L)	0.00066	<0.00050	<0.00050	0.00087	0.00094
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	3.49	<0.10	<0.10	1.01	1.04
	Selenium (Se)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Silicon (Si)-Total (mg/L)	1.02	<0.050	<0.050	5.10	5.19
	Silver (Ag)-Total (mg/L)	0.000035	<0.000010	<0.000010	<0.000010	<0.000010
	Sodium (Na)-Total (mg/L)	3.18	<0.050	<0.050	1.99	2.03
	Strontium (Sr)-Total (mg/L)	0.206	<0.00020	<0.00020	0.227	0.233
	Sulfur (S)-Total (mg/L)	74.2	<0.50	<0.50	4.23	4.22
	Thallium (Tl)-Total (mg/L)	0.000034	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	<0.00030	<0.00030	<0.00030	0.0107	0.0134
	Uranium (U)-Total (mg/L)	0.000421	<0.000010	<0.000010	0.000504	0.000551
	Vanadium (V)-Total (mg/L)	<0.00050	<0.00050	<0.00050	0.00118	0.00149
	Zinc (Zn)-Total (mg/L)	0.0525	<0.0030	<0.0030	0.0041	0.0044
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD		FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD		FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.0016	<0.0010		0.0602	0.0613
	Antimony (Sb)-Dissolved (mg/L)	0.0108	<0.00010		<0.00010	<0.00010
	Arsenic (As)-Dissolved (mg/L)	0.0233	<0.00010		0.00030	0.00028
	Barium (Ba)-Dissolved (mg/L)	0.00624	<0.000050		0.0672	0.0665
	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)	0.016	<0.010		<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.000562	<0.0000050		0.0000141	0.0000172
	Calcium (Ca)-Dissolved (mg/L)	89.1	<0.050		22.0	22.1
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	<0.00010		0.00010	0.00019
	Cobalt (Co)-Dissolved (mg/L)	0.00030	<0.00010		<0.00010	<0.00010
	Copper (Cu)-Dissolved (mg/L)	0.0106	<0.00020		0.00210	0.00202
	Iron (Fe)-Dissolved (mg/L)	0.014	<0.010		0.141	0.141
	Lead (Pb)-Dissolved (mg/L)	0.000129	<0.000050		<0.000050	<0.000050
	Lithium (Li)-Dissolved (mg/L)	0.0018	<0.0010		<0.0010	<0.0010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1758226-16	L1758226-17	L1758226-18	L1758226-19	L1758226-20
	Description	WATER	WATER	WATER	WATER	WATER
	Sampled Date	19-APR-16	19-APR-16	19-APR-16	18-APR-16	19-APR-16
	Sampled Time	16:40	18:15	15:45	14:00	17:00
	Client ID	WQ-PC-U	WQ-DC-DX	WQ-DC-B	WQ-VC-R+150	WQ-PC-D
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	11.4	6.05	53.8	7.63	10.6
	Manganese (Mn)-Total (mg/L)	0.439	0.0175	0.710	0.0292	0.566
	Mercury (Hg)-Total (mg/L)	0.0000218	0.0000168	0.0000127	0.0000149	0.0000189
	Molybdenum (Mo)-Total (mg/L)	0.000213	<0.000050	0.000167	0.000255	0.000200
	Nickel (Ni)-Total (mg/L)	0.00208	<0.00050	0.00107	0.00104	0.00216
	Phosphorus (P)-Total (mg/L)	0.078	0.052	<0.050	<0.050	<0.050
	Potassium (K)-Total (mg/L)	2.48	11.5	3.12	1.44	2.40
	Selenium (Se)-Total (mg/L)	<0.000050	0.000061	<0.000050	<0.000050	0.000071
	Silicon (Si)-Total (mg/L)	6.55	5.88	4.82	4.30	6.00
	Silver (Ag)-Total (mg/L)	0.000147	0.000027	<0.000010	0.000011	0.000150
	Sodium (Na)-Total (mg/L)	2.83	0.791	5.24	2.09	2.62
	Strontium (Sr)-Total (mg/L)	0.332	0.0616	0.426	0.179	0.292
	Sulfur (S)-Total (mg/L)	34.9	10.6	116	9.88	34.7
	Thallium (Tl)-Total (mg/L)	0.000037	<0.000010	<0.000010	<0.000010	0.000037
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Total (mg/L)	0.0419	0.00078	0.00239	0.00339	0.0326
	Uranium (U)-Total (mg/L)	0.00133	0.000023	0.00194	0.000331	0.000809
	Vanadium (V)-Total (mg/L)	0.00437	<0.00050	0.00059	0.00056	0.00327
	Zinc (Zn)-Total (mg/L)	0.0338	0.0055	0.0333	0.0068	0.375
	Zirconium (Zr)-Total (mg/L)	0.00039	<0.00030	<0.00030	<0.00030	0.00038
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
	Aluminum (Al)-Dissolved (mg/L)	0.178	0.0222	0.161	0.0961	0.172
	Antimony (Sb)-Dissolved (mg/L)	0.00071	0.00094	0.00137	0.00022	0.00077
	Arsenic (As)-Dissolved (mg/L)	0.00481	0.0101	0.00565	0.00175	0.00472
	Barium (Ba)-Dissolved (mg/L)	0.0581	0.0142	0.0365	0.0541	0.0528
	Beryllium (Be)-Dissolved (mg/L)	0.000029	<0.000020	<0.000020	<0.000020	0.000035
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Dissolved (mg/L)	0.000119	0.0000363	0.0000550	0.0000358	0.00401
	Calcium (Ca)-Dissolved (mg/L)	57.1	22.8	129	23.7	52.6
	Chromium (Cr)-Dissolved (mg/L)	0.00019	0.00014	0.00012	0.00015	0.00021
	Cobalt (Co)-Dissolved (mg/L)	0.00059	<0.00010	0.00043	0.00011	0.00070
	Copper (Cu)-Dissolved (mg/L)	0.00325	0.00218	0.00196	0.00254	0.00981
	Iron (Fe)-Dissolved (mg/L)	0.460	0.066	1.13	0.216	0.402
	Lead (Pb)-Dissolved (mg/L)	0.000673	<0.000050	0.000090	0.000096	0.000897
	Lithium (Li)-Dissolved (mg/L)	<0.0010	<0.0010	0.0029	<0.0010	<0.0010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1758226-21	L1758226-22			
	Description	WATER	WATER			
	Sampled Date	18-APR-16	18-APR-16			
	Sampled Time	17:30	16:00			
	Client ID	WQ-DC-U	WQ-DC-R			
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	48.5	38.4			
	Manganese (Mn)-Total (mg/L)	1.24	1.21			
	Mercury (Hg)-Total (mg/L)	0.0000151	0.0000125			
	Molybdenum (Mo)-Total (mg/L)	0.000262	0.000260			
	Nickel (Ni)-Total (mg/L)	0.00178	0.00117			
	Phosphorus (P)-Total (mg/L)	0.068	<0.050			
	Potassium (K)-Total (mg/L)	3.26	3.26			
	Selenium (Se)-Total (mg/L)	0.000080	0.000063			
	Silicon (Si)-Total (mg/L)	5.42	4.29			
	Silver (Ag)-Total (mg/L)	0.000028	0.000049			
	Sodium (Na)-Total (mg/L)	7.09	7.79			
	Strontium (Sr)-Total (mg/L)	0.415	0.338			
	Sulfur (S)-Total (mg/L)	113	96.1			
	Thallium (Tl)-Total (mg/L)	0.000011	<0.000010			
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010			
	Titanium (Ti)-Total (mg/L)	0.0308	0.00122			
	Uranium (U)-Total (mg/L)	0.00177	0.00125			
	Vanadium (V)-Total (mg/L)	0.00239	0.00061			
	Zinc (Zn)-Total (mg/L)	0.0392	0.0535			
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030			
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD			
	Dissolved Metals Filtration Location	FIELD	FIELD			
	Aluminum (Al)-Dissolved (mg/L)	0.113	0.0712			
	Antimony (Sb)-Dissolved (mg/L)	0.00121	0.00169			
	Arsenic (As)-Dissolved (mg/L)	0.00724	0.0124			
	Barium (Ba)-Dissolved (mg/L)	0.0372	0.0396			
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020			
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050			
	Boron (B)-Dissolved (mg/L)	0.011	0.011			
	Cadmium (Cd)-Dissolved (mg/L)	0.0000752	0.0000807			
	Calcium (Ca)-Dissolved (mg/L)	131	109			
	Chromium (Cr)-Dissolved (mg/L)	0.00013	0.00012			
	Cobalt (Co)-Dissolved (mg/L)	0.00103	0.00118			
	Copper (Cu)-Dissolved (mg/L)	0.00214	0.00238			
	Iron (Fe)-Dissolved (mg/L)	1.21	1.41			
	Lead (Pb)-Dissolved (mg/L)	0.000113	0.000652			
	Lithium (Li)-Dissolved (mg/L)	0.0028	0.0017			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1758226-1	L1758226-2	L1758226-3	L1758226-4	L1758226-5
Description	WATER	WATER	WATER	WATER	WATER
Sampled Date	20-APR-16	20-APR-16	20-APR-16	20-APR-16	19-APR-16
Sampled Time	09:30	09:50	09:10	10:00	13:35
Client ID	WQ-DESS-03	WQ-DESS-01	WQ-DC-D1B	WQ-CH-P-13-01	WQ-VC-UMN
Grouping / **Analyte**					
WATER					
Dissolved Metals					
Magnesium (Mg)-Dissolved (mg/L)	1.75	14.3	39.4	36.0	10.3
Manganese (Mn)-Dissolved (mg/L)	0.00321	0.0547	0.655	0.190	0.0400
Mercury (Hg)-Dissolved (mg/L)	0.0000199	0.0000127	<0.0000050	0.0000105	0.0000064
Molybdenum (Mo)-Dissolved (mg/L)	<0.000050	<0.000050	0.000158	<0.000050	0.000299
Nickel (Ni)-Dissolved (mg/L)	0.00158	0.00252	0.00081	0.00374	0.00069
Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved (mg/L)	2.13	2.40	4.18	2.83	1.37
Selenium (Se)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	0.000058	0.000052
Silicon (Si)-Dissolved (mg/L)	2.35	2.83	5.90	3.02	4.89
Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	0.000014	<0.000010	<0.000010
Sodium (Na)-Dissolved (mg/L)	0.673	0.921	3.28	1.38	2.58
Strontium (Sr)-Dissolved (mg/L)	0.0392	0.105	0.278	0.202	0.235
Sulfur (S)-Dissolved (mg/L)	1.51	44.8	92.6	105	14.2
Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	0.000013	<0.000010	<0.000010
Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Dissolved (mg/L)	0.00088	0.00078	0.00040	0.00053	0.00074
Uranium (U)-Dissolved (mg/L)	<0.000010	<0.000010	0.00144	<0.000010	0.000516
Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved (mg/L)	0.0121	0.859	0.170	1.95	0.0046
Zirconium (Zr)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1758226-6 WATER 19-APR-16 14:50 WQ-SEEP	L1758226-7 WATER 19-APR-16 09:45 WQ-VC-DBC	L1758226-8 WATER 19-APR-16 11:00 WQ-BC	L1758226-9 WATER 19-APR-16 17:55 WQ-DC-DX+105	L1758226-10 WATER 19-APR-16 18:00 WQ-DC-DX+105-R
Sample ID						
Description						
Sampled Date						
Sampled Time						
Client ID						
WATER						
Dissolved Metals	Magnesium (Mg)-Dissolved (mg/L)	55.9	7.63	8.27	5.50	5.43
	Manganese (Mn)-Dissolved (mg/L)	5.63	0.0605	0.330	0.0409	0.0441
	Mercury (Hg)-Dissolved (mg/L)	0.0000065	0.0000065	0.0000077	0.0000122	0.0000116
	Molybdenum (Mo)-Dissolved (mg/L)	0.000913	0.000305	0.000709	<0.000050	0.000058
	Nickel (Ni)-Dissolved (mg/L)	0.00249	0.00068	0.00115	0.00152	0.00171
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	6.01	1.16	1.48	8.01	7.83
	Selenium (Se)-Dissolved (mg/L)	0.000266	0.000050	0.000051	0.000097	0.000091
	Silicon (Si)-Dissolved (mg/L)	7.88	4.86	4.94	4.97	4.95
	Silver (Ag)-Dissolved (mg/L)	0.000012	<0.000010	0.000014	0.000047	0.000054
	Sodium (Na)-Dissolved (mg/L)	31.0	1.99	2.41	0.750	0.781
	Strontium (Sr)-Dissolved (mg/L)	0.718	0.227	0.212	0.0544	0.0553
	Sulfur (S)-Dissolved (mg/L)	212	5.52	14.2	13.6	13.5
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	0.000011	0.000012
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	0.00096	0.00072	0.00215	0.00136	0.00152
	Uranium (U)-Dissolved (mg/L)	0.00160	0.000514	0.00103	0.000067	0.000074
	Vanadium (V)-Dissolved (mg/L)	0.00226	<0.00050	<0.00050	<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)	0.0255	0.0030	0.0050	0.355	0.371
	Zirconium (Zr)-Dissolved (mg/L)	0.00070	<0.00030	0.00032	<0.00030	<0.00030

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1758226-11 WATER 19-APR-16 17:15 WQ-TP	L1758226-12 WATER 20-APR-16 10:45 FIELD BLANK	L1758226-13 WATER TRAVEL BLANK	L1758226-14 WATER 20-APR-16 12:00 WQ-VC-U	L1758226-15 WATER 20-APR-16 12:05 WQ-VC-U-R
WATER						
Dissolved Metals	Magnesium (Mg)-Dissolved (mg/L)	15.5	<0.10		7.51	7.53
	Manganese (Mn)-Dissolved (mg/L)	0.271	<0.00010		0.0266	0.0267
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	<0.0000050		<0.0000050	0.0000057
	Molybdenum (Mo)-Dissolved (mg/L)	0.000426	<0.000050		0.000275	0.000273
	Nickel (Ni)-Dissolved (mg/L)	0.00062	<0.00050		0.00071	0.00065
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050		<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	3.62	<0.10		1.04	1.06
	Selenium (Se)-Dissolved (mg/L)	<0.000050	<0.000050		0.000056	<0.000050
	Silicon (Si)-Dissolved (mg/L)	1.07	<0.050		4.84	4.85
	Silver (Ag)-Dissolved (mg/L)	0.000018	<0.000010		<0.000010	<0.000010
	Sodium (Na)-Dissolved (mg/L)	3.25	<0.050		1.98	1.99
	Strontium (Sr)-Dissolved (mg/L)	0.218	<0.00020		0.231	0.229
	Sulfur (S)-Dissolved (mg/L)	76.5	<0.50		4.29	4.32
	Thallium (Tl)-Dissolved (mg/L)	0.000036	<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		0.00048	0.00050
	Uranium (U)-Dissolved (mg/L)	0.000442	<0.000010		0.000463	0.000460
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050		<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)	0.0566	<0.0010		0.0029	0.0019
	Zirconium (Zr)-Dissolved (mg/L)	<0.00030	<0.00030		<0.00030	<0.00030

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1758226-16	L1758226-17	L1758226-18	L1758226-19	L1758226-20
Description	WATER	WATER	WATER	WATER	WATER
Sampled Date	19-APR-16	19-APR-16	19-APR-16	18-APR-16	19-APR-16
Sampled Time	16:40	18:15	15:45	14:00	17:00
Client ID	WQ-PC-U	WQ-DC-DX	WQ-DC-B	WQ-VC-R+150	WQ-PC-D
Grouping **Analyte**					
WATER					
Dissolved Metals Magnesium (Mg)-Dissolved (mg/L)	11.7	6.21	55.8	7.78	11.1
Manganese (Mn)-Dissolved (mg/L)	0.393	0.0163	0.708	0.0233	0.539
Mercury (Hg)-Dissolved (mg/L)	0.0000077	0.0000093	0.0000075	0.0000083	0.0000082
Molybdenum (Mo)-Dissolved (mg/L)	0.000130	<0.000050	0.000165	0.000252	0.000119
Nickel (Ni)-Dissolved (mg/L)	0.00107	<0.00050	0.00106	0.00103	0.00153
Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved (mg/L)	2.41	11.9	3.26	1.43	2.32
Selenium (Se)-Dissolved (mg/L)	0.000065	0.000070	0.000055	0.000051	0.000060
Silicon (Si)-Dissolved (mg/L)	4.05	5.93	4.91	4.20	3.92
Silver (Ag)-Dissolved (mg/L)	0.000016	0.000019	<0.000010	<0.000010	0.000016
Sodium (Na)-Dissolved (mg/L)	2.87	0.786	5.28	2.10	2.62
Strontium (Sr)-Dissolved (mg/L)	0.326	0.0610	0.433	0.179	0.293
Sulfur (S)-Dissolved (mg/L)	36.1	10.7	118	9.94	35.5
Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Dissolved (mg/L)	0.00330	0.00033	0.00119	0.00096	0.00289
Uranium (U)-Dissolved (mg/L)	0.00112	0.000020	0.00196	0.000309	0.000758
Vanadium (V)-Dissolved (mg/L)	0.00061	<0.00050	<0.00050	<0.00050	0.00052
Zinc (Zn)-Dissolved (mg/L)	0.0087	0.0075	0.0331	0.0060	0.363
Zirconium (Zr)-Dissolved (mg/L)	0.00036	<0.00030	<0.00030	<0.00030	0.00032

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1758226-21	L1758226-22			
	Description	WATER	WATER			
	Sampled Date	18-APR-16	18-APR-16			
	Sampled Time	17:30	16:00			
	Client ID	WQ-DC-U	WQ-DC-R			
Grouping	**Analyte**					
WATER						
Dissolved Metals	Magnesium (Mg)-Dissolved (mg/L)	52.1	40.0			
	Manganese (Mn)-Dissolved (mg/L)	1.26	1.18			
	Mercury (Hg)-Dissolved (mg/L)	<0.0000050	0.0000062			
	Molybdenum (Mo)-Dissolved (mg/L)	0.000232	0.000235			
	Nickel (Ni)-Dissolved (mg/L)	0.00118	0.00120			
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050			
	Potassium (K)-Dissolved (mg/L)	3.50	3.39			
	Selenium (Se)-Dissolved (mg/L)	0.000061	0.000075			
	Silicon (Si)-Dissolved (mg/L)	4.86	4.32			
	Silver (Ag)-Dissolved (mg/L)	<0.000010	0.000021			
	Sodium (Na)-Dissolved (mg/L)	7.44	7.70			
	Strontium (Sr)-Dissolved (mg/L)	0.425	0.339			
	Sulfur (S)-Dissolved (mg/L)	119	97.3			
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010			
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010			
	Titanium (Ti)-Dissolved (mg/L)	0.00106	0.00096			
	Uranium (U)-Dissolved (mg/L)	0.00180	0.00125			
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050			
	Zinc (Zn)-Dissolved (mg/L)	0.0300	0.0233			
	Zirconium (Zr)-Dissolved (mg/L)	<0.00030	<0.00030			

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Aluminum (Al)-Dissolved	DLA	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Duplicate	Antimony (Sb)-Dissolved	DLA	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Duplicate	Bismuth (Bi)-Dissolved	DLA	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Duplicate	Boron (B)-Dissolved	DLA	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Duplicate	Cobalt (Co)-Dissolved	DLA	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Duplicate	Lead (Pb)-Dissolved	DLA	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Duplicate	Nickel (Ni)-Dissolved	DLA	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Duplicate	Silver (Ag)-Dissolved	DLA	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Duplicate	Thallium (Tl)-Dissolved	DLA	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Duplicate	Tin (Sn)-Dissolved	DLA	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Duplicate	Titanium (Ti)-Dissolved	DLA	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Duplicate	Zinc (Zn)-Dissolved	DLA	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Duplicate	Zirconium (Zr)-Dissolved	DLA	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Duplicate	Aluminum (Al)-Total	DLA	L1758226-1, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Bismuth (Bi)-Total	DLA	L1758226-1, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Lead (Pb)-Total	DLA	L1758226-1, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Selenium (Se)-Total	DLA	L1758226-1, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Silver (Ag)-Total	DLA	L1758226-1, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Tin (Sn)-Total	DLA	L1758226-1, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Titanium (Ti)-Total	DLA	L1758226-1, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Vanadium (V)-Total	DLA	L1758226-1, -2, -3, -4, -5, -6, -7, -8, -9
Duplicate	Zirconium (Zr)-Total	DLA	L1758226-1, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Chromium (Cr)-Total	MB-LOR	L1758226-1, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Molybdenum (Mo)-Total	MB-LOR	L1758226-1, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Phosphorus (P)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sulfur (S)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9

Reference Information

	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Boron (B)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Uranium (U)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1758226-1, -10, -11, -12, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Ammonia, Total (as N)	MS-B	L1758226-13
Matrix Spike	Ammonia, Total (as N)	MS-B	L1758226-13
Matrix Spike	Manganese (Mn)-Total	MS-B	L1758226-10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -20, -21, -22
Matrix Spike	Molybdenum (Mo)-Total	MS-B	L1758226-10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -20, -21, -22
Matrix Spike	Sodium (Na)-Total	MS-B	L1758226-10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -20, -21, -22
Matrix Spike	Strontium (Sr)-Total	MS-B	L1758226-10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -20, -21, -22
Matrix Spike	Zinc (Zn)-Total	MS-B	L1758226-10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -20, -21, -22

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLA	Detection Limit adjusted for required dilution
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
DLIS	Detection Limit Adjusted: Insufficient Sample
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.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

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

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

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

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

Reference Information

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

HARDNESS-CALC-VA Water Hardness APHA 2340B

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

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

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

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

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

IONBALANCE-VA Water Ion Balance Calculation APHA 1030E

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

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

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

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

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

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

MET-DIS-LOW-ICP-VA Water Dissolved Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

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

Reference Information

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

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

MET-TOT-LOW-ICP-VA Water Total Metals in Water by ICPOES EPA 3005A/6010B

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Reference Information

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

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

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

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

Chain of Custody Numbers:

1 2 3

GLOSSARY OF REPORT TERMS

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

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

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1758226-COFC

COC Number: 14 -

Page ____ of ____

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

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ALK-PCT-VA,EC-PCT-VA,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	P	P	F/P		
[redacted]	WQ-DESS-03	20-Apr-16	0930	Water	R	R	R	R	R	R	R	R	R	9
[redacted]	WQ-DESS-01	20-Apr-16	0950	Water	R	R	R	R	R	R	R	R	R	9
[redacted]	WQ-DC-D1b	20-Apr-16	0910	Water	R	R	R	R	R	R	R	R	R	9
[redacted]	WQ-CH-P-13-01	20-Apr-16	1000	Water	R	R	R	R	R	R	R	R	R	9
[redacted]	WQ-VC-UMN	19-Apr-16	1335	Water	R	R	R	R	R	R	R	R	R	9
[redacted]	WQ-SEEP	19-Apr-16	1450	Water	R	R	R	R	R	R	R	R	R	9
[redacted]	WQ-VC-DBC	19-APR-16	0945	Water	R	R	R	R	R	R	R	R	R	9
[redacted]	WQ-BC	19-APR-16	1100	Water	R	R	R	R	R	R	R	R	R	9
[redacted]														
[redacted]														
[redacted]														
[redacted]														

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

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

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

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

SAMPLE CONDITION AS RECEIVED (lab use only)

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

SIF Observations ☐ Yes ☐ No

Custody seal intact ☐ Yes ☐ No

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
2.6	2.5	2.8	[redacted]	5	6

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:
SCOTT DILLING	20-APR-2016	1545	[redacted]	Apr 20 16	09 7pm	Jean	21 Apr	12:35

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1758226-COFC

COC Number: 14 -

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Report To		Report Format		Turnaround Time (TAT) (Rush TAT is not available for all tests)
Company:	EDI	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)		☐ Regular (Default TAT if received by 3 pm - business days)
Contact:	Lyndsay Doetzel	Quality Control (QC) Report with Report ☐ Yes ☐ No		P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	2195 - 2nd Avenue Whitehorse, YT Y1A 3T8	☐ Criteria on Report - provide details below if box checked Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX		E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
Phone:	867-393-4882	Email 1 or Fax ldoetzel@edynamics.com		E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
		Email 2 Emilie.Hamm@gov.yk.ca		Specify Date Required for E2,E or P:
		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: Sean Slugget	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-DX+105	19 - Apr -16	1755	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-DC-DX+105-F	19 - Apr -16	1800	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-TP	19 - Apr -16	1515	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	FIELD BLANK	20 Apr -16	1045	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	TRAVEL BLANK	~~Apr-16~~	—	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-VC-U	20 - Apr -16	12:00	Water	R	R	R	R	R	R	R	R	R					9
[redacted]	WQ-VC-U-F	20 APR 16	12:05	water	R	R	R	R	R	R	R	R	R					9
[redacted]																		
[redacted]																		
[redacted]																		
[redacted]																		
[redacted]																		

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

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
2.6	1.8	1.6	[redacted]	1.5	1.6

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:
SCOTT DILLING	20-APR-16	1545	[redacted]	[redacted]	3:51pm	Jean	21/Apr	12:35

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1758226-COFC

COC Number: 14 -

Page ____ of ____

Report To		Report Form		
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)		ALS Contact: Sean Slugget	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						
	WQ-PC-U	19 - Apr -16	1640	Water	R	R	R	R	R	R	R	R	R					9
	WQ-DC-DX	19 - Apr -16	1815	Water	R	R	R	R	R	R	R	R	R					9
	WQ-DC-B	19 - Apr -16	1545.	Water	R	R	R	R	R	R	R	R	R					9
	WQ-VC-R+150	18 - Apr -16	1400	Water	R	R	R	R	R	R	R	R	R					9
	WQ-PC-D	19 - Apr -16	1700	Water	R	R	R	R	R	R	R	R	R					9
	WQ-DC-U	18 - Apr -16	1730	Water	R	R	R	R	R	R	R	R	R					9
	WQ-DC-R	18-APR-16	1600	Water	R	R	R	R	R	R	R	R	R					9

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 ☑	Custody seal Intact	Yes ☐	No ☐
Cooling Initiated	☑			

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
25.4	17.2	21.6		5	6

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:
SCOTT DILLING	20-APR-2016	1545.			5:30pm	Jean	21 Apr	12:35

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

Date Received: 20-APR-16
Report Date: 04-MAY-16 12:41 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1758238

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

Can Dang
Senior Account Manager

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1758238-1				
	Description	Water				
	Sampled Date	20-APR-16				
	Sampled Time	11:55				
	Client ID	WQ-PW				
Grouping	**Analyte**					
WATER						
Physical Tests	Colour, True (CU)	<5.0				
	Conductivity (uS/cm)	378				
	Hardness (as CaCO3) (mg/L)	195				
	pH (pH)	7.83				
	Total Dissolved Solids (mg/L)	217				
	Turbidity (NTU)	0.11				
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	182				
	Chloride (Cl) (mg/L)	<0.50				
	Fluoride (F) (mg/L)	0.110				
	Nitrate (as N) (mg/L)	0.114				
	Nitrite (as N) (mg/L)	<0.0010				
	Sulfate (SO4) (mg/L)	36.3				
	Anion Sum (meq/L)	4.41				
	Cation Sum (meq/L)	4.14				
	Cation - Anion Balance (%)	-3.1				
Total Metals	Aluminum (Al)-Total (mg/L)	<0.010				
	Antimony (Sb)-Total (mg/L)	<0.00050				
	Arsenic (As)-Total (mg/L)	0.00036				
	Barium (Ba)-Total (mg/L)	0.087				
	Boron (B)-Total (mg/L)	<0.10				
	Cadmium (Cd)-Total (mg/L)	<0.00020				
	Calcium (Ca)-Total (mg/L)	44.7				
	Chromium (Cr)-Total (mg/L)	<0.0020				
	Copper (Cu)-Total (mg/L)	<0.0010				
	Iron (Fe)-Total (mg/L)	<0.030				
	Lead (Pb)-Total (mg/L)	0.00055				
	Magnesium (Mg)-Total (mg/L)	20.2				
	Manganese (Mn)-Total (mg/L)	<0.0020				
	Mercury (Hg)-Total (mg/L)	<0.00020				
	Potassium (K)-Total (mg/L)	0.88				
	Selenium (Se)-Total (mg/L)	<0.0010				
	Sodium (Na)-Total (mg/L)	5.1				
	Uranium (U)-Total (mg/L)	0.00180				
	Zinc (Zn)-Total (mg/L)	<0.050				

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Antimony (Sb)-Total	DLA	L1758238-1
Duplicate	Lead (Pb)-Total	DLA	L1758238-1
Duplicate	Selenium (Se)-Total	DLA	L1758238-1
Matrix Spike	Copper (Cu)-Total	MS-B	L1758238-1

Qualifiers for Individual Parameters Listed:

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

Test Method References:

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

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

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

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

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

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

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

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

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

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

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

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

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

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

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

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

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

Reference Information

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

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

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

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

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

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

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

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

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

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

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

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

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

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

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

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

Chain of Custody Numbers:

1

GLOSSARY OF REPORT TERMS

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

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

ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1758238-COFC

COC Number: 14 -

Page ____ of ____

Report To		Report Format / D	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:	Meghan Marjanovic	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 mmarjanovic@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 mmarjanovic@edynamics.com	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q49512	Approver ID:	Cost Center:
Job #:	MOUNT NANSEN ~~15-Y-0146~~ 16Y0089	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		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	FULL-TOT-DW-WR	Number of Containers
[redacted]	WQ - PW	20 - Jan-16	11:55	Water	R	3
[redacted]						
[redacted]						
[redacted]						
[redacted]						
[redacted]						
[redacted]						
[redacted]						
[redacted]						
[redacted]						
[redacted]						
[redacted]						

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

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
2.8			5	6	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: SCOTT DILLING	Date: 20-APR-2016	Time: 1545	Received by:	Date: Apr 20/16	Time: 3:51pm	Received by:	Date: 1Apr21	Time: 1234:35

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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

Date Received: 29-APR-16
Report Date: 19-MAY-16 10:56 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1761963

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

Can Dang
Senior Account Manager

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1761963-1 Water 26-APR-16 19:00 WQ-DC-DX	L1761963-2 Water 27-APR-16 09:30 WQ-PC-U	L1761963-3 Water 27-APR-16 15:00 WQ-BC	L1761963-4 Water 27-APR-16 10:20 WQ-PC-D	L1761963-5 Water 28-APR-16 16:25 WQ-DESS-01
WATER						
Physical Tests	Conductivity (uS/cm)	80.4	110	110	117	525
	Hardness (as CaCO3) (mg/L)	41.6	55.6	55.4	57.3	277
	pH (pH)	7.22	7.13	7.47	7.22	5.68
	Total Suspended Solids (mg/L)	8.0	24.0	1060	243	23.3
	Total Dissolved Solids (mg/L)	45.8	64.1	61.7	67.7	343
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	22.9	21.1	30.8	22.6	3.6
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Total (as CaCO3) (mg/L)	22.9	21.1	30.8	22.6	3.6
	Ammonia, Total (as N) (mg/L)	0.0078	0.0784	0.0314	0.0910	0.0076
	Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.032	0.031	0.051	0.034	0.039
	Nitrate (as N) (mg/L)	<0.0050	0.0263	0.0368	0.0312	<0.0050
	Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sulfate (SO4) (mg/L)	13.2	27.5	19.9	29.8	243
	Anion Sum (meq/L)	0.73	1.00	1.03	1.08	5.12
	Cation Sum (meq/L)	0.96	1.28	1.25	1.30	5.75
	Cation - Anion Balance (%)	13.5	12.6	9.3	9.6	5.7
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanate (mg/L)	<2.0 DLIS	0.32	0.33	0.37	0.28
	Thiocyanate (SCN) (mg/L)	1.26	1.27	0.69	1.09	1.19
Total Metals	Aluminum (Al)-Total (mg/L)	0.233	0.863	15.7	3.82	0.311
	Antimony (Sb)-Total (mg/L)	0.00051	0.00076	0.00222	0.00398	0.00016
	Arsenic (As)-Total (mg/L)	0.00702	0.00820	0.0701	0.0618	0.00254
	Barium (Ba)-Total (mg/L)	0.0160	0.0481	0.406	0.120	0.0215
	Beryllium (Be)-Total (mg/L)	0.000055	0.000060	0.000639	0.000227	0.000040
	Bismuth (Bi)-Total (mg/L)	<0.000050	0.000061	0.000899	0.000550	<0.000050
	Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.0000435	0.000168	0.00205	0.00133	0.00444
	Calcium (Ca)-Total (mg/L)	10.7	15.7	22.0	18.8	61.6
	Chromium (Cr)-Total (mg/L)	<0.00050 DLB	0.00104	0.0212	0.00478	<0.00050 DLB
	Cobalt (Co)-Total (mg/L)	0.00014	0.00065	0.00980	0.00264	0.00021
	Copper (Cu)-Total (mg/L)	<0.0050 DLB	<0.0050 DLB	0.0352	0.0203	<0.0050 DLB
	Iron (Fe)-Total (mg/L)	0.314	1.35	22.8	7.03	0.205
	Lead (Pb)-Total (mg/L)	0.000315	0.00380	0.0701	0.0416	0.000102
	Lithium (Li)-Total (mg/L)	<0.0010	0.0011	0.0101	0.0029	0.0016

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1761963-6	L1761963-7	L1761963-8	L1761963-9	L1761963-10
Description	Water	Water	Water	Water	Water
Sampled Date	28-APR-16	28-APR-16	28-APR-16	28-APR-16	28-APR-16
Sampled Time	19:40	10:35	10:00	09:15	13:30
Client ID	FIELD BLANK	WQ-SEEP-R	WQ-SEEP	WQ-DC-U	WQ-DC-R-R
Grouping / **Analyte**					
WATER					
Physical Tests Conductivity (uS/cm)	<2.0	1290	1300	708	689
Hardness (as CaCO3) (mg/L)	<0.50	689	691	384	368
pH (pH)	5.43	7.52	7.54	7.96	7.88
Total Suspended Solids (mg/L)	<3.0	60.7	35.3	11.3	6.7
Total Dissolved Solids (mg/L)	<1.0	876	952	471	453
Anions and Nutrients Alkalinity, Bicarbonate (as CaCO3) (mg/L)	<1.0	211	208	105	95.0
Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity, Total (as CaCO3) (mg/L)	<1.0	211	208	105	95.0
Ammonia, Total (as N) (mg/L)	<0.0050	3.34	3.18	0.400	0.308
Chloride (Cl) (mg/L)	<0.50	1.0	1.2	<0.50	0.95
Fluoride (F) (mg/L)	<0.020	0.066	0.079	0.059	0.059
Nitrate (as N) (mg/L)	<0.0050	0.362	0.395	0.0420	0.102
Nitrite (as N) (mg/L)	<0.0010	0.0111	0.0107	0.0022	0.0040
Sulfate (SO4) (mg/L)	<0.30	447	524	265	256
Anion Sum (meq/L)	<0.10	13.6	15.1	7.62	7.26
Cation Sum (meq/L)	<0.10	16.1	16.2	8.15	7.84
Cation - Anion Balance (%)	0.0	8.6	3.2	3.4	3.8
Cyanides Cyanide, Weak Acid Diss (mg/L)	<0.0050	0.0053	0.0107	<0.0050	<0.0050
Cyanide, Total (mg/L)	<0.0050	0.0493	0.0413	<0.0050	<0.0050
Cyanate (mg/L)	<0.20	<0.20	<0.20	<0.20	0.21
Thiocyanate (SCN) (mg/L)	<0.50	4.26	3.92	0.83	0.64
Total Metals Aluminum (Al)-Total (mg/L)	<0.0030	0.0667	0.0710	0.240	0.0670
Antimony (Sb)-Total (mg/L)	<0.00010	0.00063	0.00064	0.00153	0.00174
Arsenic (As)-Total (mg/L)	<0.00010	0.0948	0.101	0.0102	0.0121
Barium (Ba)-Total (mg/L)	<0.000050	0.0621	0.0633	0.0382	0.0451
Beryllium (Be)-Total (mg/L)	<0.000020	<0.000020	0.000022	<0.000020	<0.000020
Bismuth (Bi)-Total (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Total (mg/L)	<0.010	0.044	0.046	0.013	0.013
Cadmium (Cd)-Total (mg/L)	<0.0000050	0.000344	0.000363	0.000134	0.000108
Calcium (Ca)-Total (mg/L)	<0.050	196	200	92.3	93.6
Chromium (Cr)-Total (mg/L)	<0.00010	<0.0010 DLB	<0.0010 DLB	<0.00050 DLB	<0.00050 DLB
Cobalt (Co)-Total (mg/L)	<0.00010	0.00578	0.00603	0.00105	0.00105
Copper (Cu)-Total (mg/L)	0.00216 RRV	0.00503	0.00540	<0.0050 DLB	0.00226
Iron (Fe)-Total (mg/L)	<0.010	14.1	14.5	1.64	1.12
Lead (Pb)-Total (mg/L)	0.000072 RRV	0.000461	0.000605	0.000799	0.00116
Lithium (Li)-Total (mg/L)	<0.0010	0.0014	0.0015	0.0025	0.0022

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1761963-11 Water 28-APR-16 13:15 WQ-DC-R	L1761963-12 Water 28-APR-16 17:30 WQ-NW-SEEP-02	L1761963-13 Water 27-APR-16 12:55 WQ-VC-DBC	L1761963-14 Water 26-APR-16 18:35 WQ-DC-DX+105	L1761963-15 Water 27-APR-16 18:20 WQ-VC-R+150
WATER						
Physical Tests	Conductivity (uS/cm)	691	455	78.7	113	100
	Hardness (as CaCO3) (mg/L)	371	226	42.2	52.7	50.1
	pH (pH)	7.90	7.43	7.46	7.11	7.51
	Total Suspended Solids (mg/L)	<3.0	28.0	717	34.0	174
	Total Dissolved Solids (mg/L)	456	291	43.1	63.0	55.6
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	95.7	22.7	31.3	15.3	32.0
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0	<1.0	<1.0	<1.0
	Alkalinity, Total (as CaCO3) (mg/L)	95.7	22.7	31.3	15.3	32.0
	Ammonia, Total (as N) (mg/L)	0.304	0.0094	0.0173	0.0065	0.0119
	Chloride (Cl) (mg/L)	0.72	1.10	<0.50	<0.50	<0.50
	Fluoride (F) (mg/L)	0.059	0.109	0.042	0.037	0.041
	Nitrate (as N) (mg/L)	0.104	0.0775	0.0287	<0.0050	0.0207
	Nitrite (as N) (mg/L)	0.0027	<0.0010	<0.0010	<0.0010	<0.0010
	Sulfate (SO4) (mg/L)	257	191	6.87	30.8	16.1
	Anion Sum (meq/L)	7.29	4.47	0.77	0.95	0.98
	Cation Sum (meq/L)	7.91	4.57	0.95	1.19	1.12
	Cation - Anion Balance (%)	4.0	1.1	10.3	11.3	6.6
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cyanate (mg/L)	0.26	<0.20	0.44	<0.20	0.20
	Thiocyanate (SCN) (mg/L)	0.63	<0.50	0.67	1.01	0.62
Total Metals	Aluminum (Al)-Total (mg/L)	0.0748	0.340	17.3	0.224	6.26
	Antimony (Sb)-Total (mg/L)	0.00196	0.00238	0.00088	0.00213	0.00089
	Arsenic (As)-Total (mg/L)	0.0148	0.0213	0.0217	0.0166	0.0157
	Barium (Ba)-Total (mg/L)	0.0435	0.0132	0.444	0.0259	0.176
	Beryllium (Be)-Total (mg/L)	<0.000020	0.000046	0.000630	0.000029	0.000230
	Bismuth (Bi)-Total (mg/L)	<0.000050	0.000183	0.000394	<0.000050	0.000217
	Boron (B)-Total (mg/L)	0.013	<0.010	<0.010	<0.010	<0.010
	Cadmium (Cd)-Total (mg/L)	0.000154	0.00213	0.000543	0.00231	0.000298
	Calcium (Ca)-Total (mg/L)	91.4	70.2	18.2	15.3	14.9
	Chromium (Cr)-Total (mg/L)	<0.00050 DLB	<0.00050 DLB	0.0237	<0.00050 DLB	0.00861
	Cobalt (Co)-Total (mg/L)	0.00105	0.00024	0.00939	0.00022	0.00327
	Copper (Cu)-Total (mg/L)	<0.0050 DLB	0.0507	0.0316	0.00687	0.0133
	Iron (Fe)-Total (mg/L)	1.11	1.07	25.2	0.324	8.98
	Lead (Pb)-Total (mg/L)	0.00269	0.0129	0.0271	0.00378	0.0132
	Lithium (Li)-Total (mg/L)	0.0021	0.0015	0.0125	0.0011	0.0048

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1761963-16	L1761963-17	L1761963-18	L1761963-19	L1761963-20
Description	Water	Water	Water	Water	Water
Sampled Date	27-APR-16		28-APR-16	28-APR-16	27-APR-16
Sampled Time	19:15		16:00	16:45	14:25
Client ID	WQ-VC-UMN	TRAVEL BLANK	WQ-DC-D16	WQ-CH-P-13-01	WQ-VC-U
Grouping / **Analyte**					
WATER					
Physical Tests Conductivity (uS/cm)	115	<2.0	457	960	72.3
Hardness (as CaCO3) (mg/L)	56.3	<0.50	239	544	38.4
pH (pH)	7.56	5.32	7.97	4.99	7.45
Total Suspended Solids (mg/L)	268	<3.0	3.3	<3.0	460
Total Dissolved Solids (mg/L)	63.6	<1.0	285	696	38.7
Anions and Nutrients Alkalinity, Bicarbonate (as CaCO3) (mg/L)	35.1	<1.0	83.6	<1.0	29.9
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)	35.1	<1.0	83.6	<1.0	29.9
Ammonia, Total (as N) (mg/L)	0.0136	<0.0050	0.0157	0.0098	0.0163
Chloride (Cl) (mg/L)	<0.50	<0.50	<0.50	<1.0 DLA	<0.50
Fluoride (F) (mg/L)	0.041	<0.020	0.087	0.051	0.042
Nitrate (as N) (mg/L)	0.0289	<0.0050	<0.0050	0.011	0.0257
Nitrite (as N) (mg/L)	<0.0010	<0.0010	<0.0010	<0.0020 DLA	<0.0010
Sulfate (SO4) (mg/L)	19.9	<0.30	145	509	4.78
Anion Sum (meq/L)	1.12	<0.10	4.70	10.6	0.70
Cation Sum (meq/L)	1.24	<0.10	4.97	11.2	0.87
Cation - Anion Balance (%)	5.2	0.0	2.8	2.8	10.8
Cyanides Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cyanide, Total (mg/L)	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cyanate (mg/L)	<0.20	<0.20	<0.20	<0.20	0.26
Thiocyanate (SCN) (mg/L)	0.62	<0.50	0.65	0.98	0.61
Total Metals Aluminum (Al)-Total (mg/L)	5.46	<0.0030	0.0500	0.302	18.6
Antimony (Sb)-Total (mg/L)	0.00084	<0.00010	0.00506	0.00010	0.00083
Arsenic (As)-Total (mg/L)	0.0151	<0.00010	0.0245	0.00210	0.0169
Barium (Ba)-Total (mg/L)	0.165	<0.000050	0.0358	0.0190	0.411
Beryllium (Be)-Total (mg/L)	0.000202	<0.000020	<0.000020	0.000041	0.000548
Bismuth (Bi)-Total (mg/L)	0.000181	<0.000050	<0.000050	<0.000050	0.000333
Boron (B)-Total (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd)-Total (mg/L)	0.000283	<0.0000050	0.000346	0.0105	0.000332
Calcium (Ca)-Total (mg/L)	16.2	<0.050 RRV	65.0 DLB	111 DLB	16.3
Chromium (Cr)-Total (mg/L)	0.00758	0.00037	<0.00050	<0.00050	0.0245
Cobalt (Co)-Total (mg/L)	0.00292	<0.00010	0.00023	<0.00010	0.00916
Copper (Cu)-Total (mg/L)	0.0124	<0.00050	<0.0050 DLB	<0.0050 DLB	0.0270
Iron (Fe)-Total (mg/L)	7.65	<0.010	0.236	0.075	25.1
Lead (Pb)-Total (mg/L)	0.0121	<0.000050	0.00498	<0.000050	0.0198
Lithium (Li)-Total (mg/L)	0.0042	<0.0010	0.0030	0.0024	0.0124

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1761963-21	L1761963-22			
	Description	Water	Water			
	Sampled Date	28-APR-16	28-APR-16			
	Sampled Time	11:40	11:30			
	Client ID	WQ-TP	WQ-DC-B			
Grouping	**Analyte**					
WATER						
Physical Tests	Conductivity (uS/cm)	326	694			
	Hardness (as CaCO3) (mg/L)	168	384			
	pH (pH)	7.40	7.93			
	Total Suspended Solids (mg/L)	30.0	17.3			
	Total Dissolved Solids (mg/L)	207	458			
Anions and Nutrients	Alkalinity, Bicarbonate (as CaCO3) (mg/L)	16.3	98.5			
	Alkalinity, Carbonate (as CaCO3) (mg/L)	<1.0	<1.0			
	Alkalinity, Hydroxide (as CaCO3) (mg/L)	<1.0	<1.0			
	Alkalinity, Total (as CaCO3) (mg/L)	16.3	98.5			
	Ammonia, Total (as N) (mg/L)	0.0645	0.0347			
	Chloride (Cl) (mg/L)	<0.50	<0.50			
	Fluoride (F) (mg/L)	0.059	0.055			
	Nitrate (as N) (mg/L)	0.0496	0.0149			
	Nitrite (as N) (mg/L)	<0.0010	<0.0010			
	Sulfate (SO4) (mg/L)	129	261			
	Anion Sum (meq/L)	3.01	7.40			
	Cation Sum (meq/L)	3.53	7.99			
	Cation - Anion Balance (%)	7.9	3.8			
Cyanides	Cyanide, Weak Acid Diss (mg/L)	<0.0050	<0.0050			
	Cyanide, Total (mg/L)	<0.0050	<0.0050			
	Cyanate (mg/L)	<0.20	0.21			
	Thiocyanate (SCN) (mg/L)	<0.50	0.73			
Total Metals	Aluminum (Al)-Total (mg/L)	0.136	0.329			
	Antimony (Sb)-Total (mg/L)	0.0145	0.00178			
	Arsenic (As)-Total (mg/L)	0.0539	0.00935			
	Barium (Ba)-Total (mg/L)	0.00708	0.0393			
	Beryllium (Be)-Total (mg/L)	<0.000020	0.000022			
	Bismuth (Bi)-Total (mg/L)	0.000447	<0.000050			
	Boron (B)-Total (mg/L)	<0.010	<0.010			
	Cadmium (Cd)-Total (mg/L)	0.00211	0.000138			
	Calcium (Ca)-Total (mg/L)	51.7	88.7			
	Chromium (Cr)-Total (mg/L)	<0.00050 DLB	<0.0010 DLB			
	Cobalt (Co)-Total (mg/L)	0.00038	0.00051			
	Copper (Cu)-Total (mg/L)	0.0263	<0.0050 DLB			
	Iron (Fe)-Total (mg/L)	0.590	1.58			
	Lead (Pb)-Total (mg/L)	0.0305	0.00111			
	Lithium (Li)-Total (mg/L)	0.0015	0.0029			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1761963-1	L1761963-2	L1761963-3	L1761963-4	L1761963-5
Description	Water	Water	Water	Water	Water
Sampled Date	26-APR-16	27-APR-16	27-APR-16	27-APR-16	28-APR-16
Sampled Time	19:00	09:30	15:00	10:20	16:25
Client ID	WQ-DC-DX	WQ-PC-U	WQ-BC	WQ-PC-D	WQ-DESS-01
Grouping / **Analyte**					
WATER					
Total Metals Magnesium (Mg)-Total (mg/L)	3.12	3.59	8.14	4.79	28.4
Manganese (Mn)-Total (mg/L)	0.0109	0.215	1.36	0.424	0.226
Mercury (Hg)-Total (mg/L)	0.0000257	0.0000246	0.000097	0.000065	0.0000216
Molybdenum (Mo)-Total (mg/L)	0.000051	0.000107	0.00120	0.000259	<0.000050
Nickel (Ni)-Total (mg/L)	0.00058	0.00242	0.0147	0.00436	0.00390
Phosphorus (P)-Total (mg/L)	0.062	0.052	0.861	0.227	<0.050
Potassium (K)-Total (mg/L)	3.30	1.43	3.39	1.96	2.16
Selenium (Se)-Total (mg/L)	0.000053	<0.000050	0.000220	0.000088	<0.000050
Silicon (Si)-Total (mg/L)	2.46	3.38	26.5	8.09	3.00
Silver (Ag)-Total (mg/L)	0.000027	0.000065	0.000747	0.000505	0.000012
Sodium (Na)-Total (mg/L)	0.564	1.20	2.32	1.41	1.22
Strontium (Sr)-Total (mg/L)	0.0362	0.104	0.168	0.126	0.163
Sulfur (S)-Total (mg/L)	4.46	9.06	6.81	10.2	83.8
Thallium (Tl)-Total (mg/L)	<0.000010	0.000016	0.000233	0.000089	<0.000010
Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	0.00025	<0.00010	<0.00010
Titanium (Ti)-Total (mg/L)	0.00859	0.0200	0.496	0.114	0.00207
Uranium (U)-Total (mg/L)	0.000031	0.000277	0.00249	0.000789	0.000015
Vanadium (V)-Total (mg/L)	0.00149	0.00263	0.0454	0.0114	0.00156
Zinc (Zn)-Total (mg/L)	0.0049	0.0197	0.173	0.121	1.65
Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	0.00167	0.00051	<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)	0.116	0.343	0.186	0.313	0.270
Antimony (Sb)-Dissolved (mg/L)	0.00041	0.00041	0.00029	0.00055	0.00010
Arsenic (As)-Dissolved (mg/L)	0.00429	0.00391	0.00243	0.00408	0.00195
Barium (Ba)-Dissolved (mg/L)	0.0137	0.0402	0.0444	0.0386	0.0205
Beryllium (Be)-Dissolved (mg/L)	<0.000020	0.000052	0.000036	0.000042	0.000039
Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Dissolved (mg/L)	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd)-Dissolved (mg/L)	0.0000371	0.0000854	0.000137	0.000288	0.00438
Calcium (Ca)-Dissolved (mg/L)	11.3	16.3	16.2	16.8	63.2
Chromium (Cr)-Dissolved (mg/L)	0.00023	0.00027	0.00017	0.00025	0.00020
Cobalt (Co)-Dissolved (mg/L)	<0.00010	0.00042	0.00039	0.00045	0.00019
Copper (Cu)-Dissolved (mg/L)	0.00210	0.00315	0.00452	0.00519	0.00262
Iron (Fe)-Dissolved (mg/L)	0.109	0.470	0.342	0.443	0.155
Lead (Pb)-Dissolved (mg/L)	0.000067	0.000429	0.000673	0.00100	0.000060
Lithium (Li)-Dissolved (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	0.0017

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1761963-6	L1761963-7	L1761963-8	L1761963-9	L1761963-10
Description	Water	Water	Water	Water	Water
Sampled Date	28-APR-16	28-APR-16	28-APR-16	28-APR-16	28-APR-16
Sampled Time	19:40	10:35	10:00	09:15	13:30
Client ID	FIELD BLANK	WQ-SEEP-R	WQ-SEEP	WQ-DC-U	WQ-DC-R-R
Grouping / **Analyte**					
WATER					
Total Metals Magnesium (Mg)-Total (mg/L)	<0.10	44.8	45.4	32.2	31.0
Manganese (Mn)-Total (mg/L)	<0.00010	4.91	5.09	0.986	0.976
Mercury (Hg)-Total (mg/L)	<0.0000050	0.0000102	0.0000129	0.0000174	0.0000164
Molybdenum (Mo)-Total (mg/L)	<0.000050	0.000874	0.000908	0.000245	0.000268
Nickel (Ni)-Total (mg/L)	<0.00050	0.00260	0.00274	0.00138	0.00115
Phosphorus (P)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Total (mg/L)	<0.10	4.94	5.13	2.73	2.99
Selenium (Se)-Total (mg/L)	<0.000050	0.000227	0.000208	0.000070	0.000087
Silicon (Si)-Total (mg/L)	<0.050	6.38	6.50	3.51	3.34
Silver (Ag)-Total (mg/L)	<0.000010	0.000056	0.000077	0.000024	0.000039
Sodium (Na)-Total (mg/L)	<0.050	26.1	26.7	5.39	6.95
Strontium (Sr)-Total (mg/L)	<0.00020	0.592	0.604	0.306	0.297
Sulfur (S)-Total (mg/L)	<0.50	179	183	88.5	89.6
Thallium (Tl)-Total (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Total (mg/L)	<0.00030	0.00196	0.00205	0.00639	0.00116
Uranium (U)-Total (mg/L)	<0.000010	0.00165	0.00162	0.00128	0.00113
Vanadium (V)-Total (mg/L)	<0.00050	0.00329	0.00334	0.00209	0.00231
Zinc (Zn)-Total (mg/L)	<0.0030	0.0332	0.0289	0.0199	0.0144
Zirconium (Zr)-Total (mg/L)	<0.00030	0.00060	0.00061	<0.00030	<0.00030
Dissolved Metals Dissolved Mercury Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
Dissolved Metals Filtration Location	FIELD	FIELD	FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved (mg/L)	<0.0010	0.0337	0.0361	0.133	0.0517
Antimony (Sb)-Dissolved (mg/L)	<0.00010	0.00049	0.00048	0.00145	0.00158
Arsenic (As)-Dissolved (mg/L)	<0.00010	0.0661	0.0682	0.00826	0.00896
Barium (Ba)-Dissolved (mg/L)	<0.000050	0.0577	0.0599	0.0369	0.0435
Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020
Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Dissolved (mg/L)	<0.010	0.043	0.043	0.012	0.013
Cadmium (Cd)-Dissolved (mg/L)	<0.0000050	0.000205	0.000205	0.000109	0.0000886
Calcium (Ca)-Dissolved (mg/L)	<0.050	201	201	97.9	95.6
Chromium (Cr)-Dissolved (mg/L)	<0.00010	0.00046	0.00035	0.00016	0.00016
Cobalt (Co)-Dissolved (mg/L)	<0.00010	0.00578	0.00576	0.00101	0.00101
Copper (Cu)-Dissolved (mg/L)	<0.00020	0.00247	0.00280	0.00221	0.00200
Iron (Fe)-Dissolved (mg/L)	<0.010	12.0	12.1	1.38	0.865
Lead (Pb)-Dissolved (mg/L)	<0.000050	<0.000050	0.000060	0.000265	0.000376
Lithium (Li)-Dissolved (mg/L)	<0.0010	0.0014	0.0014	0.0026	0.0023

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1761963-11	L1761963-12	L1761963-13	L1761963-14	L1761963-15
Description	Water	Water	Water	Water	Water
Sampled Date	28-APR-16	28-APR-16	27-APR-16	26-APR-16	27-APR-16
Sampled Time	13:15	17:30	12:55	18:35	18:20
Client ID	WQ-DC-R	WQ-NW-SEEP-02	WQ-VC-DBC	WQ-DC-DX+105	WQ-VC-R+150
Grouping / **Analyte**					
WATER					
Total Metals					
Magnesium (Mg)-Total (mg/L)	29.9	10.6	8.58	3.51	5.63
Manganese (Mn)-Total (mg/L)	0.974	0.102	0.562	0.104	0.313
Mercury (Hg)-Total (mg/L)	0.0000156	0.0000111	0.000094	0.0000240	0.000053
Molybdenum (Mo)-Total (mg/L)	0.000272	0.000144	0.000710	0.000057	0.000513
Nickel (Ni)-Total (mg/L)	0.00117	0.00055	0.0148	0.00131	0.00573
Phosphorus (P)-Total (mg/L)	<0.050	0.057	0.984	<0.050	0.261
Potassium (K)-Total (mg/L)	2.96	1.23	2.70	3.08	1.89
Selenium (Se)-Total (mg/L)	0.000077	0.000094	0.000257	0.000074	0.000151
Silicon (Si)-Total (mg/L)	3.27	1.46	24.5	2.49	11.4
Silver (Ag)-Total (mg/L)	0.000054	0.000320	0.000237	0.000119	0.000150
Sodium (Na)-Total (mg/L)	6.72	0.379	2.06	0.556	1.56
Strontium (Sr)-Total (mg/L)	0.286	0.141	0.188	0.0424	0.130
Sulfur (S)-Total (mg/L)	86.4	63.2	2.70	10.5	5.39
Thallium (Tl)-Total (mg/L)	<0.000010	0.000036	0.000154	0.000017	0.000078
Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	0.00022	<0.00010	0.00011
Titanium (Ti)-Total (mg/L)	0.00150	0.00396	0.502	0.00416	0.198
Uranium (U)-Total (mg/L)	0.00108	0.000281	0.00251	0.000054	0.000948
Vanadium (V)-Total (mg/L)	0.00222	0.00223	0.0540	0.00134	0.0190
Zinc (Zn)-Total (mg/L)	0.0180	0.120	0.0986	0.316	0.0398
Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030	0.00129	<0.00030	0.00086
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)	0.0516	0.0106	0.154	0.142	0.125
Antimony (Sb)-Dissolved (mg/L)	0.00160	0.00077	<0.00010	0.00157	0.00020
Arsenic (As)-Dissolved (mg/L)	0.00949	0.00280	0.00061	0.00889	0.00150
Barium (Ba)-Dissolved (mg/L)	0.0438	0.00829	0.0587	0.0229	0.0556
Beryllium (Be)-Dissolved (mg/L)	<0.000020	<0.000020	0.000033	0.000028	0.000021
Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron (B)-Dissolved (mg/L)	0.013	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd)-Dissolved (mg/L)	0.000111	0.00160	0.0000408	0.00219	0.0000445
Calcium (Ca)-Dissolved (mg/L)	96.5	72.8	11.4	15.4	13.4
Chromium (Cr)-Dissolved (mg/L)	0.00016	<0.00010	0.00017	0.00019	0.00022
Cobalt (Co)-Dissolved (mg/L)	0.00105	<0.00010	0.00021	0.00018	0.00023
Copper (Cu)-Dissolved (mg/L)	0.00202	0.00907	0.00362	0.00631	0.00323
Iron (Fe)-Dissolved (mg/L)	0.857	0.021	0.274	0.139	0.299
Lead (Pb)-Dissolved (mg/L)	0.000422	0.000390	0.000205	0.000859	0.000182
Lithium (Li)-Dissolved (mg/L)	0.0022	0.0012	<0.0010	0.0011	<0.0010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1761963-16	L1761963-17	L1761963-18	L1761963-19	L1761963-20
Description	Water	Water	Water	Water	Water
Sampled Date	27-APR-16		28-APR-16	28-APR-16	27-APR-16
Sampled Time	19:15		16:00	16:45	14:25
Client ID	WQ-VC-UMN	TRAVEL BLANK	WQ-DC-D16	WQ-CH-P-13-01	WQ-VC-U
Grouping / **Analyte**					
WATER					
Total Metals Magnesium (Mg)-Total (mg/L)	5.98	<0.10	18.6	57.4	8.26
Manganese (Mn)-Total (mg/L)	0.305	0.00017 RRV	0.452	0.466	0.448
Mercury (Hg)-Total (mg/L)	0.0000093	<0.0000050	0.0000171	0.0000189	0.000094
Molybdenum (Mo)-Total (mg/L)	0.000504	<0.000050	0.000167	<0.000050	0.000714
Nickel (Ni)-Total (mg/L)	0.00511	0.00081 RRV	0.00082	0.00641	0.0143
Phosphorus (P)-Total (mg/L)	0.213	<0.050	<0.050	<0.050	0.843
Potassium (K)-Total (mg/L)	1.77	<0.10	3.20	2.34	2.78
Selenium (Se)-Total (mg/L)	0.000119	<0.000050	<0.000050	<0.000050	0.000248
Silicon (Si)-Total (mg/L)	10.1	<0.050	4.00	3.09	26.4
Silver (Ag)-Total (mg/L)	0.000137	<0.000010	0.000093	0.000013	0.000140
Sodium (Na)-Total (mg/L)	1.60	<0.050	1.89	1.76	2.24
Strontium (Sr)-Total (mg/L)	0.140	<0.00020	0.165	0.274	0.175
Sulfur (S)-Total (mg/L)	6.67	<0.50	50.1	166	2.03
Thallium (Tl)-Total (mg/L)	0.000067	<0.000010	<0.000010	<0.000010	0.000160
Tin (Sn)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	0.00024
Titanium (Ti)-Total (mg/L)	0.168	<0.00030	0.00147	0.00141	0.568
Uranium (U)-Total (mg/L)	0.000898	<0.000010	0.000573	<0.000010	0.00204
Vanadium (V)-Total (mg/L)	0.0168	<0.00050	0.00112	0.00170	0.0551
Zinc (Zn)-Total (mg/L)	0.0363	<0.0030	0.0868	3.74	0.0785
Zirconium (Zr)-Total (mg/L)	0.00065	<0.00030	<0.00030	<0.00030	0.00116
Dissolved Metals Dissolved Mercury Filtration Location	FIELD		FIELD	FIELD	FIELD
Dissolved Metals Filtration Location	FIELD		FIELD	FIELD	FIELD
Aluminum (Al)-Dissolved (mg/L)	0.116		0.0259	0.296	0.164
Antimony (Sb)-Dissolved (mg/L)	0.00021		0.00461	<0.00010	<0.00010
Arsenic (As)-Dissolved (mg/L)	0.00161		0.0199	0.00162	0.00039
Barium (Ba)-Dissolved (mg/L)	0.0559		0.0342	0.0195	0.0581
Beryllium (Be)-Dissolved (mg/L)	<0.000020		<0.000020	0.000039	0.000022
Bismuth (Bi)-Dissolved (mg/L)	<0.000050		<0.000050	<0.000050	<0.000050
Boron (B)-Dissolved (mg/L)	<0.010		<0.010	<0.010	<0.010
Cadmium (Cd)-Dissolved (mg/L)	0.0000428		0.000250	0.0110	0.0000275
Calcium (Ca)-Dissolved (mg/L)	14.9		65.0	118	10.2
Chromium (Cr)-Dissolved (mg/L)	0.00017		0.00011	0.00015	0.00019
Cobalt (Co)-Dissolved (mg/L)	0.00021		0.00021	<0.00010	0.00020
Copper (Cu)-Dissolved (mg/L)	0.00313		0.00312	0.00210	0.00345
Iron (Fe)-Dissolved (mg/L)	0.253		0.133	0.059	0.268
Lead (Pb)-Dissolved (mg/L)	0.000209		0.00140	<0.000050	0.000128
Lithium (Li)-Dissolved (mg/L)	<0.0010		0.0030	0.0025	<0.0010

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1761963-21	L1761963-22			
	Description	Water	Water			
	Sampled Date	28-APR-16	28-APR-16			
	Sampled Time	11:40	11:30			
	Client ID	WQ-TP	WQ-DC-B			
Grouping	**Analyte**					
WATER						
Total Metals	Magnesium (Mg)-Total (mg/L)	5.95	34.9			
	Manganese (Mn)-Total (mg/L)	0.513	0.411			
	Mercury (Hg)-Total (mg/L)	0.0000153	0.0000203			
	Molybdenum (Mo)-Total (mg/L)	0.000234	0.000180			
	Nickel (Ni)-Total (mg/L)	0.00107	0.00133			
	Phosphorus (P)-Total (mg/L)	<0.050	<0.050			
	Potassium (K)-Total (mg/L)	2.05	2.71			
	Selenium (Se)-Total (mg/L)	<0.000050	0.000068			
	Silicon (Si)-Total (mg/L)	0.971	3.65			
	Silver (Ag)-Total (mg/L)	0.000630	0.000026			
	Sodium (Na)-Total (mg/L)	1.73	3.47			
	Strontium (Sr)-Total (mg/L)	0.118	0.302			
	Sulfur (S)-Total (mg/L)	45.3	87.8			
	Thallium (Tl)-Total (mg/L)	0.000060	<0.000010			
	Tin (Sn)-Total (mg/L)	<0.00010	<0.00010			
	Titanium (Ti)-Total (mg/L)	0.00160	0.0122			
	Uranium (U)-Total (mg/L)	0.000143	0.00141			
	Vanadium (V)-Total (mg/L)	0.00104	0.00246			
	Zinc (Zn)-Total (mg/L)	0.241	0.0227			
	Zirconium (Zr)-Total (mg/L)	<0.00030	<0.00030			
Dissolved Metals	Dissolved Mercury Filtration Location	FIELD	FIELD			
	Dissolved Metals Filtration Location	FIELD	FIELD			
	Aluminum (Al)-Dissolved (mg/L)	0.0236	0.129			
	Antimony (Sb)-Dissolved (mg/L)	0.0108	0.00168			
	Arsenic (As)-Dissolved (mg/L)	0.0172	0.00714			
	Barium (Ba)-Dissolved (mg/L)	0.00454	0.0345			
	Beryllium (Be)-Dissolved (mg/L)	<0.000020	0.000024			
	Bismuth (Bi)-Dissolved (mg/L)	<0.000050	<0.000050			
	Boron (B)-Dissolved (mg/L)	<0.010	<0.010			
	Cadmium (Cd)-Dissolved (mg/L)	0.00196	0.000103			
	Calcium (Ca)-Dissolved (mg/L)	56.4	93.4			
	Chromium (Cr)-Dissolved (mg/L)	<0.00010	0.00015			
	Cobalt (Co)-Dissolved (mg/L)	0.00035	0.00043			
	Copper (Cu)-Dissolved (mg/L)	0.0204	0.00220			
	Iron (Fe)-Dissolved (mg/L)	0.081	1.11			
	Lead (Pb)-Dissolved (mg/L)	0.00245	0.000322			
	Lithium (Li)-Dissolved (mg/L)	0.0017	0.0029			

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L1761963-1 Water 26-APR-16 19:00 WQ-DC-DX	L1761963-2 Water 27-APR-16 09:30 WQ-PC-U	L1761963-3 Water 27-APR-16 15:00 WQ-BC	L1761963-4 Water 27-APR-16 10:20 WQ-PC-D	L1761963-5 Water 28-APR-16 16:25 WQ-DESS-01
WATER						
Dissolved Metals	Magnesium (Mg)-Dissolved (mg/L)	3.26	3.62	3.66	3.74	29.0
	Manganese (Mn)-Dissolved (mg/L)	0.00859	0.203	0.224	0.220	0.221
	Mercury (Hg)-Dissolved (mg/L)	0.0000222	0.0000211	0.0000171	0.0000194	0.0000163
	Molybdenum (Mo)-Dissolved (mg/L)	<0.000050	0.000079	0.000463	0.000081	<0.000050
	Nickel (Ni)-Dissolved (mg/L)	<0.00050	0.00125	0.00121	0.00116	0.00387
	Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
	Potassium (K)-Dissolved (mg/L)	3.46	1.37	1.26	1.35	2.15
	Selenium (Se)-Dissolved (mg/L)	0.000053	0.000053	0.000060	0.000060	0.000060
	Silicon (Si)-Dissolved (mg/L)	2.44	2.63	2.98	2.63	3.00
	Silver (Ag)-Dissolved (mg/L)	0.000022	0.000017	0.000019	0.000019	<0.000010
	Sodium (Na)-Dissolved (mg/L)	0.577	1.43	1.31	1.19	1.23
	Strontium (Sr)-Dissolved (mg/L)	0.0364	0.104	0.100	0.105	0.163
	Sulfur (S)-Dissolved (mg/L)	4.65	9.43	6.82	9.95	84.5
	Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
	Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Titanium (Ti)-Dissolved (mg/L)	0.00189	0.00275	0.00319	0.00277	0.00082
	Uranium (U)-Dissolved (mg/L)	0.000023	0.000208	0.000449	0.000209	0.000012
	Vanadium (V)-Dissolved (mg/L)	<0.00050	<0.00050	0.00062	<0.00050	<0.00050
	Zinc (Zn)-Dissolved (mg/L)	0.0036	0.0122	0.0049	0.0356	1.68
	Zirconium (Zr)-Dissolved (mg/L)	<0.00030	0.00038	0.00038	0.00049	<0.00030

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1761963-6	L1761963-7	L1761963-8	L1761963-9	L1761963-10
Description	Water	Water	Water	Water	Water
Sampled Date	28-APR-16	28-APR-16	28-APR-16	28-APR-16	28-APR-16
Sampled Time	19:40	10:35	10:00	09:15	13:30
Client ID	FIELD BLANK	WQ-SEEP-R	WQ-SEEP	WQ-DC-U	WQ-DC-R-R
Grouping **Analyte**					
WATER					
Dissolved Metals Magnesium (Mg)-Dissolved (mg/L)	<0.10	45.7	45.8	34.0	31.4
Manganese (Mn)-Dissolved (mg/L)	0.00019 RRV	4.99	4.93	1.01	0.957
Mercury (Hg)-Dissolved (mg/L)	<0.0000050	0.0000123	0.0000129	0.0000130	0.0000101
Molybdenum (Mo)-Dissolved (mg/L)	<0.000050	0.000857	0.000859	0.000236	0.000244
Nickel (Ni)-Dissolved (mg/L)	<0.00050	0.00239	0.00240	0.00128	0.00109
Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved (mg/L)	<0.10	4.98	5.00	2.84	2.92
Selenium (Se)-Dissolved (mg/L)	<0.000050	0.000213	0.000228	0.000070	0.000061
Silicon (Si)-Dissolved (mg/L)	<0.050	6.37	6.39	3.52	3.32
Silver (Ag)-Dissolved (mg/L)	<0.000010	<0.000010	0.000012	0.000010	0.000014
Sodium (Na)-Dissolved (mg/L)	<0.050	26.8	26.9	5.64	6.89
Strontium (Sr)-Dissolved (mg/L)	<0.00020	0.595	0.599	0.315	0.295
Sulfur (S)-Dissolved (mg/L)	<0.50	178	179	91.7	89.4
Thallium (Tl)-Dissolved (mg/L)	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	0.00043 DTC
Titanium (Ti)-Dissolved (mg/L)	<0.00030	0.00100	0.00108	0.00112	0.00073
Uranium (U)-Dissolved (mg/L)	<0.000010	0.00160	0.00160	0.00133	0.00111
Vanadium (V)-Dissolved (mg/L)	<0.00050	0.00169	0.00179	0.00078	0.00073
Zinc (Zn)-Dissolved (mg/L)	<0.0010	0.0263	0.0270	0.0181	0.0138
Zirconium (Zr)-Dissolved (mg/L)	<0.00030	0.00061	0.00061	<0.00030	<0.00030

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1761963-11	L1761963-12	L1761963-13	L1761963-14	L1761963-15
Description	Water	Water	Water	Water	Water
Sampled Date	28-APR-16	28-APR-16	27-APR-16	26-APR-16	27-APR-16
Sampled Time	13:15	17:30	12:55	18:35	18:20
Client ID	WQ-DC-R	WQ-NW-SEEP-02	WQ-VC-DBC	WQ-DC-DX+105	WQ-VC-R+150
Grouping / **Analyte**					
WATER					
Dissolved Metals Magnesium (Mg)-Dissolved (mg/L)	31.7	10.7	3.36	3.48	4.06
Manganese (Mn)-Dissolved (mg/L)	0.995	0.0614	0.0429	0.0830	0.0712
Mercury (Hg)-Dissolved (mg/L)	0.0000093	<0.0000050	0.0000157	0.0000173	0.0000146
Molybdenum (Mo)-Dissolved (mg/L)	0.000267	0.000125	0.000202	<0.000050	0.000208
Nickel (Ni)-Dissolved (mg/L)	0.00110	<0.00050	0.00097	0.00116	0.00102
Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium (K)-Dissolved (mg/L)	2.96	1.05	1.06	2.99	1.10
Selenium (Se)-Dissolved (mg/L)	0.000088	0.000092	0.000065	0.000064	<0.000050
Silicon (Si)-Dissolved (mg/L)	3.38	0.912	2.97	2.36	2.77
Silver (Ag)-Dissolved (mg/L)	0.000013	0.000012	<0.000010	0.000038	0.000012
Sodium (Na)-Dissolved (mg/L)	6.90	0.376	1.04	0.549	1.21
Strontium (Sr)-Dissolved (mg/L)	0.295	0.140	0.107	0.0419	0.109
Sulfur (S)-Dissolved (mg/L)	90.3	65.4	2.52	10.6	5.57
Thallium (Tl)-Dissolved (mg/L)	<0.000010	0.000011	<0.000010	0.000011	<0.000010
Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)-Dissolved (mg/L)	0.00078	<0.00030	0.00157	0.00160	0.00127
Uranium (U)-Dissolved (mg/L)	0.00111	0.000238	0.000268	0.000045	0.000243
Vanadium (V)-Dissolved (mg/L)	0.00076	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved (mg/L)	0.0159	0.0703	0.0028	0.310	0.0068
Zirconium (Zr)-Dissolved (mg/L)	<0.00030	<0.00030	<0.00030	<0.00030	0.00038

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1761963-16	L1761963-17	L1761963-18	L1761963-19	L1761963-20
Description	Water	Water	Water	Water	Water
Sampled Date	27-APR-16		28-APR-16	28-APR-16	27-APR-16
Sampled Time	19:15		16:00	16:45	14:25
Client ID	WQ-VC-UMN	TRAVEL BLANK	WQ-DC-D16	WQ-CH-P-13-01	WQ-VC-U
Grouping **Analyte**					
WATER					
Dissolved Metals Magnesium (Mg)-Dissolved (mg/L)	4.61		18.6	60.7	3.13
Manganese (Mn)-Dissolved (mg/L)	0.0669		0.446	0.472	0.0268
Mercury (Hg)-Dissolved (mg/L)	0.0000128		0.0000143	0.0000130	0.0000156
Molybdenum (Mo)-Dissolved (mg/L)	0.000228		0.000155	<0.000050	0.000159
Nickel (Ni)-Dissolved (mg/L)	0.00081		0.00071	0.00646	0.00092
Phosphorus (P)-Dissolved (mg/L)	<0.050		<0.050	<0.050	<0.050
Potassium (K)-Dissolved (mg/L)	1.09		3.16	2.46	1.03
Selenium (Se)-Dissolved (mg/L)	<0.000050		<0.000050	0.000056	<0.000050
Silicon (Si)-Dissolved (mg/L)	2.84		4.01	3.24	2.89
Silver (Ag)-Dissolved (mg/L)	<0.000010		0.000028	0.000010	<0.000010
Sodium (Na)-Dissolved (mg/L)	1.36		1.88	1.82	0.996
Strontium (Sr)-Dissolved (mg/L)	0.122		0.162	0.289	0.101
Sulfur (S)-Dissolved (mg/L)	6.79		50.6	175	1.86
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)	0.00142		0.00069	0.00049	0.00186
Uranium (U)-Dissolved (mg/L)	0.000269		0.000559	<0.000010	0.000236
Vanadium (V)-Dissolved (mg/L)	<0.00050		<0.00050	<0.00050	<0.00050
Zinc (Zn)-Dissolved (mg/L)	0.0027		0.0842	3.91	0.0020
Zirconium (Zr)-Dissolved (mg/L)	<0.00030		<0.00030	<0.00030	<0.00030

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID	L1761963-21	L1761963-22			
Description	Water	Water			
Sampled Date	28-APR-16	28-APR-16			
Sampled Time	11:40	11:30			
Client ID	WQ-TP	WQ-DC-B			
Grouping / **Analyte**					
WATER					
Dissolved Metals Magnesium (Mg)-Dissolved (mg/L)	6.63	36.7			
Manganese (Mn)-Dissolved (mg/L)	0.536	0.403			
Mercury (Hg)-Dissolved (mg/L)	0.0000062	0.0000117			
Molybdenum (Mo)-Dissolved (mg/L)	0.000237	0.000184			
Nickel (Ni)-Dissolved (mg/L)	0.00079	0.00105			
Phosphorus (P)-Dissolved (mg/L)	<0.050	<0.050			
Potassium (K)-Dissolved (mg/L)	2.11	2.77			
Selenium (Se)-Dissolved (mg/L)	<0.000050	0.000090			
Silicon (Si)-Dissolved (mg/L)	0.830	3.47			
Silver (Ag)-Dissolved (mg/L)	0.000110	0.000011			
Sodium (Na)-Dissolved (mg/L)	1.84	3.58			
Strontium (Sr)-Dissolved (mg/L)	0.126	0.312			
Sulfur (S)-Dissolved (mg/L)	50.3	90.7			
Thallium (Tl)-Dissolved (mg/L)	0.000051	<0.000010			
Tin (Sn)-Dissolved (mg/L)	<0.00010	<0.00010			
Titanium (Ti)-Dissolved (mg/L)	<0.00030	0.00108			
Uranium (U)-Dissolved (mg/L)	0.000138	0.00143			
Vanadium (V)-Dissolved (mg/L)	<0.00050	0.00061			
Zinc (Zn)-Dissolved (mg/L)	0.235	0.0206			
Zirconium (Zr)-Dissolved (mg/L)	<0.00030	<0.00030			

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Alkalinity, Total (as CaCO3)	B	L1761963-17
Method Blank	Alkalinity, Total (as CaCO3)	B	L1761963-17
Duplicate	Chromium (Cr)-Total	DLB	L1761963-14, -15, -16, -17, -18, -19, -20, -21, -22
Duplicate	Cyanide, Weak Acid Diss	HTD	L1761963-1, -14
Method Blank	Chromium (Cr)-Total	MB-LOR	L1761963-1, -10, -11, -12, -13, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Copper (Cu)-Total	MB-LOR	L1761963-1, -10, -11, -12, -13, -2, -3, -4, -5, -6, -7, -8, -9
Method Blank	Chromium (Cr)-Total	MB-LOR	L1761963-14, -15, -16, -17, -18, -19, -20, -21, -22
Matrix Spike	Sulfate (SO4)	MS-B	L1761963-1, -10, -11, -12, -13, -14, -15, -16, -17, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1761963-1, -10, -11, -12, -13, -14, -15, -16, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1761963-1, -10, -11, -12, -13, -14, -15, -16, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Molybdenum (Mo)-Dissolved	MS-B	L1761963-1, -10, -11, -12, -13, -14, -15, -16, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1761963-1, -10, -11, -12, -13, -14, -15, -16, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1761963-1, -10, -11, -12, -13, -14, -15, -16, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Aluminum (Al)-Dissolved	MS-B	L1761963-1, -10, -11, -12, -13, -14, -15, -16, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Copper (Cu)-Dissolved	MS-B	L1761963-1, -10, -11, -12, -13, -14, -15, -16, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L1761963-1, -10, -11, -12, -13, -14, -15, -16, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1761963-1, -10, -11, -12, -13, -14, -15, -16, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Aluminum (Al)-Total	MS-B	L1761963-1, -10, -11, -12, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Total	MS-B	L1761963-1, -10, -11, -12, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Total	MS-B	L1761963-1, -10, -11, -12, -13, -2, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L1761963-1, -10, -11, -12, -13, -14, -15, -16, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Manganese (Mn)-Dissolved	MS-B	L1761963-1, -10, -11, -12, -13, -14, -15, -16, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L1761963-1, -10, -11, -12, -13, -14, -15, -16, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Uranium (U)-Dissolved	MS-B	L1761963-1, -10, -11, -12, -13, -14, -15, -16, -18, -19, -2, -20, -21, -22, -3, -4, -5, -6, -7, -8, -9
Matrix Spike	Barium (Ba)-Total	MS-B	L1761963-14, -15, -16, -17, -18, -19, -20, -21, -22
Matrix Spike	Sodium (Na)-Total	MS-B	L1761963-14, -15, -16, -17, -18, -19, -20, -21, -22
Matrix Spike	Strontium (Sr)-Total	MS-B	L1761963-14, -15, -16, -17, -18, -19, -20, -21, -22

Qualifiers for Individual Parameters Listed:

Qualifier	Description
B	Method Blank exceeds ALS DQO. All associated sample results are at least 5 times greater than blank levels and are considered reliable.
DLA	Detection Limit adjusted for required dilution
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
DLIS	Detection Limit Adjusted: Insufficient Sample
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.
HTD	Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

Reference Information

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

HARDNESS-CALC-VA Water Hardness APHA 2340B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in 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.

Reference Information

MET-DIS-LOW-ICP-VA Water Dissolved Metals in Water by ICPOES EPA 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves filtration (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

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

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

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

MET-TOT-LOW-ICP-VA Water Total Metals in Water by ICPOES EPA 3005A/6010B

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Reference Information

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

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

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

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

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

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

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

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

Chain of Custody Numbers:

1 2 3 4

GLOSSARY OF REPORT TERMS

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

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

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1761963-COFC

COC Number: 14 -

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Report To		Report Format /
Company:	EDI	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Contact:	Lyndsay Doetzel	Quality Control (QC) Report with Report ☐ Yes ☐ No
Address:	2195 - 2nd Avenue Whitehorse, YT Y1A 3T8	☐ Criteria on Report - provide details below if box checked
Phone:	867-393-4882	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

(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	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)		ALS Contact: Sean Slugget	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	P	F/P		
	WQ-DC-DX	26-Apr-16	19:00	Water	R	R	R	R	R	R	R	R	R	9
	WQ-PC-U	27-Apr-16	09:30	Water	R	R	R	R	R	R	R	R	R	9
	WQ-BC	27-Apr-16	15:00	Water	R	R	R	R	R	R	R	R	R	9
	WQ-PC-D	27-Apr-16	10:20	Water	R	R	R	R	R	R	R	R	R	9
	WQ-DESS-01	28-Apr-16	16:25	Water	R	R	R	R	R	R	R	R	R	9
	FIELD BLANK	28-Apr-16	19:40	Water	R	R	R	R	R	R	R	R	R	9

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

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

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

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

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

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

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
3.1	0.2	0.9	1.9		

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:
				Apr 29-16	09:20 AM			

Chain of Custody (COC) / Analytical Request Form

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L1761963-COFC

COC Number: 14 -

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Report To		Report Format / D	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
Phone:	867-393-4882	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
		Email 1 or Fax 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):

ALS Contact: Sean Slugget

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	P	P	F/P		
	WQ-SEEP-r	28 - Apr -16	10:35	Water	R	R	R	R	R	R	R	R	R	9
	WQ-SEEP	28 - Apr -16	10:00	Water	R	R	R	R	R	R	R	R	R	9
	WQ-DC-U	28 - Apr -16	9:15	Water	R	R	R	R	R	R	R	R	R	9
	WQ-DC-R-r	28 - Apr -16	13:30	Water	R	R	R	R	R	R	R	R	R	9
	WQ-DC-R	28 - Apr -16	13:15	Water	R	R	R	R	R	R	R	R	R	9
		- Apr -16		Water	R	R	R	R	R	R	R	R	R	9

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		
3.1	0.2	0.9	1.9		

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:
	29-APR-2016	0910		Apr 29/16	9:20AM			

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

Date Received: 29-APR-16
Report Date: 11-MAY-16 10:39 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1761985

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

Can Dang
Senior Account Manager

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L1761985-1
	Description	Water
	Sampled Date	28-APR-16
	Sampled Time	19:45
	Client ID	WQ-PW
Grouping	**Analyte**	
WATER		
Physical Tests	Colour, True (CU)	<5.0
	Conductivity (uS/cm)	383
	Hardness (as CaCO3) (mg/L)	203
	pH (pH)	8.23
	Total Dissolved Solids (mg/L)	213
	Turbidity (NTU)	0.24
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	171
	Chloride (Cl) (mg/L)	<0.50
	Fluoride (F) (mg/L)	0.105
	Nitrate (as N) (mg/L)	0.115
	Nitrite (as N) (mg/L)	<0.0010
	Sulfate (SO4) (mg/L)	36.2
	Anion Sum (meq/L)	4.19
	Cation Sum (meq/L)	4.29
	Cation - Anion Balance (%)	1.2
Total Metals	Aluminum (Al)-Total (mg/L)	<0.010
	Antimony (Sb)-Total (mg/L)	<0.00050
	Arsenic (As)-Total (mg/L)	0.00042
	Barium (Ba)-Total (mg/L)	0.087
	Boron (B)-Total (mg/L)	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020
	Calcium (Ca)-Total (mg/L)	47.0
	Chromium (Cr)-Total (mg/L)	<0.0020
	Copper (Cu)-Total (mg/L)	<0.0010
	Iron (Fe)-Total (mg/L)	<0.030
	Lead (Pb)-Total (mg/L)	0.00059
	Magnesium (Mg)-Total (mg/L)	20.8
	Manganese (Mn)-Total (mg/L)	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020
	Potassium (K)-Total (mg/L)	0.94
	Selenium (Se)-Total (mg/L)	<0.0010
	Sodium (Na)-Total (mg/L)	5.0
	Uranium (U)-Total (mg/L)	0.00198
	Zinc (Zn)-Total (mg/L)	<0.050

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

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Chromium (Cr)-Total	DLB	L1761985-1
Matrix Spike	Sulfate (SO4)	MS-B	L1761985-1
Matrix Spike	Calcium (Ca)-Total	MS-B	L1761985-1

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
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.

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

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

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-WR	Water	Fluoride in Water by IC	EPA 300.1 (mod)

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

HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

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

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

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

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

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

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

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

Reference Information

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

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

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

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

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

Chain of Custody Numbers:

1

GLOSSARY OF REPORT TERMS

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

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

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

Date Received: 29-APR-16
Report Date: 19-MAY-16 15:45 (MT)
Version: FINAL

Client Phone: 867-393-4882

Certificate of Analysis

Lab Work Order #: L1761990

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

Comments: The bioassay analysis was subcontracted to Nautilus Environmental Ltd. in Burnaby, BC. Refer to their report appended for detail.

Can Dang
Senior Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample ID Description Sampled Date Sampled Time Client ID					
Grouping **Analyte**					

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

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

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

Laboratory Definition Code	Laboratory Location

Chain of Custody Numbers:

1

GLOSSARY OF REPORT TERMS

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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

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

Report Date: May 12, 2016
Work Order: 16496

Data Report

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

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

Sample ID	Collection Date and Time	96-h LC50 (%v/v)
L1761990-1 WQ-SEEP	April 28, 2016 @ N/A	>100

N/A = Not Available.

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

Yvonne Lam, B.Sc.
Laboratory Biologist

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

Rainbow Trout Summary Sheet

Client: ALS

Start Date/Time: May 2/16 @ 1330 h

Work Order No.: 16496

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: L1761990-1 WQ-SEEP
Sample Date: Apr 28/16
Date Received: May 2/16
Sample Volume: 2x20L
Other: -

Dilution Water:

Type: Dechlorinated Municipal Tap Water
Hardness (mg/L $CaCO_3$): 10
Alkalinity (mg/L $CaCO_3$): 8

Test Organism Information:

Batch No.: 040716
Source: ~~Ma~~ Miracle Springs
No. Fish/Volume (L): 10/10L
Loading Density (g/L): 0.32
Mean Length ± SD (mm): 30 ± 2 Range: 26 - 34
Mean Weight ± SD (g): 0.32 ± 0.08 Range: 0.22 - 0.48

Zinc Reference Toxicant Results:

Reference Toxicant ID: RTZn39
Stock Solution ID: 15Zn05
Date Initiated: Apr 28/16
96-h LC50 (95% CL): 91.9 (68.7 - 123.5) mg/L Zn

Reference Toxicant Mean and Historical Range: 69.4 (34.1 - 141.3) mg/L Zn
Reference Toxicant CV (%): 43%

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

Reviewed by: [signature]

Date reviewed: May 11, 2016

96-Hour Rainbow Trout Toxicity Test Data Sheet

Client/Project#: ALS (EDJ Env.)
Sample I.D. L1761990-1 WR-SEEP
W.O. # 16496
RBT Batch #: 040716
Date Collected/Time: Apr 28/16 @ Not available
Date Setup/Time: ~~Apr~~ May 2/16 @ 1330h
Sample Setup By: EC

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

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

Undiluted Sample WQ			
Parameters	Initial WQ	Adjustment	30 min WQ
Temp °C	14.0		14.0
pH	6.9		7.3
D.O. (mg/L)	9.0		9.6
Cond. (µS/cm)	1274		1274
Salinity (ppt)	0.6		0.6

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
Ctl				10	10	10	10	14.0	15.0	15.0	15.0	15.0	10.3	9.7	9.7	9.9	9.8	6.8	6.5	6.6	6.8	6.7	27	29
6.25				10	10	10	10	14.0	15.0	15.0	15.0	15.0	10.3	9.7	9.8	9.9	9.8	7.0	7.0	7.2	7.2	7.1	123	124
12.5				10	10	10	10	14.0	15.0	15.0	15.0	15.0	10.3	9.8	9.9	9.8	9.8	7.0	7.2	7.3	7.3	7.2	214	216
25				10	10	10	10	14.0	15.0	15.0	15.0	15.0	10.3	9.9	10.0	9.9	9.8	7.0	7.6	7.7	7.7	7.7	406	407
50				10	10	10	10	14.0	15.0	15.0	15.0	15.0	10.3	9.9	10.0	9.9	9.9	7.3	8.0	8.0	8.0	8.0	700	697
100				10	10	10	10	14.0	15.0	15.0	15.0	15.0	9.6	10.0	10.0	9.9	9.9	7.3	8.2	8.2	8.2	8.3	1274	1218
Initials				EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC	EC

Sample Description/Comments: Orange, Opaque, Odourless, some particulates

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

Other Observations:

Reviewed by: [signature]
Date Reviewed: May 11, 2016

L1761990

VANCOUVER

ALS Environmental

Subcontract Request Form

Subcontract To:

NAUTILUS ENVIRONMENTAL
8664 COMMERCE COURT
BURNABY,BC V5A 4N7

NOTES: Please reference on final report and invoice: PO# L1761990
ALS requires QC data to be provided with your final results.

WO# 16496

LC50

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

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
L1761990-1 WQ-SEEP	Trout Bioassay LC50 (96 Hour) - Nautilus (TROUT-LC50-96HR-NL 1)	4/28/2016 5/10/2016	

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

Analysis and reporting info contact: Can Dang
8081 LOUGHEED HWY
SUITE 100
BURNABY,BC V5A 1W9
Phone: (604) 253-4188 Email: can.dang@alsglobal.com

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

Shipped By: Pamp Date Shipped: May 2/16.

Received By: Nautilus Date Received: May 02/16 @ 08:30

Verified By: NY - Nan Yamamoto Date Verified:

Temperature: 5.3 °C

Sample Integrity Issues: 2 x 20 L

Sample Description:
Orange, Opaque, Odourless, some particulates.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1761990-COFC

COC Number: 14 -

Page ____ of ____

Report To		Report Format / L...	(Rush Turnaround Time (TAT) is not available for all tests)
Company:	EDI	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Lyndsay Doetzel	Quality Control (QC) Report with Report ☐ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	2195 - 2nd Avenue Whitehorse, YT Y1A 3T8	☐ Criteria on Report - provide details below if box checked Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX	E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	867-393-4882	Email 1 or Fax ldoetzel@edynamics.com	Specify Date Required for E2,E or P:
		Email 2 Emilie.Hamm@gov.yk.ca	
		Email 3 erik.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 #:	Q55556	Approver ID:	Cost Center:
Job #:	MOUNT NANSEN 16-Y-0089	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		ALS Contact: Sean Sluggett	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	R TSS - TOT-DW-VR	LCSO	Number of Containers
	~~WQ-PW~~ WQ-SEEP	28-Apr-16	10:00	Water	R	✓	3

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 °C	4.2				

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: Sean Sluggett	Date: 29-Apr-16	Time: 1:29 PM	Received by:	Date:	Time:

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1761985-COFC

COC Number: 14 -

Page ____ of ____

Report To		Report Format / Distribution		(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 #:	Q55556	Approver ID:	Cost Center:
Job #:	MOUNT NANSEN 16-Y-0089	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only)		ALS Contact: Sean Sluggett	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	FULL-TOT-DW-WR	Number of Containers
	WQ-PW	28-Apr-16	1945	Water	R	3

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	
0.2			

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:
	29-APR-2016	0910		Apr 29 16	9:20 AM			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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

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