AGNICO EAGLE

MELIADINE GOLD MINE

Ocean Discharge Monitoring Plan

SEPTEMBER 2021
VERSION 4

EXECUTIVE SUMMARY

Agnico Eagle Mines Limited (Agnico Eagle) operates the Meliadine Gold Mine (the Mine), located approximately 25 kilometres (km) north of Rankin Inlet, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut. The mine plan includes open pit and underground mining methods for the development of the Tiriganiaq gold deposit, with two open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) and one underground mine.

The underground mine will operate below the base of the continuous permafrost and will act as a sink for groundwater flow during operation, with water induced to flow through the bedrock to the underground mine workings.

Groundwater from the underground mine workings will be collected and pumped for storage on the surface in the water containment ponds to manage contact surface and groundwater, as described in the Water Management Plan (WMP; Agnico Eagle 2021a[1]). The management of groundwater is further described in the Groundwater Management Plan (GWMP; Agnico Eagle 2021b[1]), which entails the short-, medium- and long-term management strategies, including storage of saline water on site and discharge to sea at Melvin Bay as per the Nunavut Impact Review Board (NIRB) Project Certificate 006 Amendment 001 (February 2019). As part of medium- and long-term water management, excess groundwater will be treated to meet, as applicable, Metal and Diamond Mining Effluent Regulations (MDMER), Canadian Council of Ministers of the Environment water quality guidelines for the protection of aquatic life (Marine; CCME) and/or background conditions at the edge of the mixing zone for discharge into Melvin Bay via an engineered diffuser.

This document presents the Mine's Ocean Discharge Monitoring Plan (ODMP) for discharge of treated groundwater effluent into the marine environment. It summarizes the field sampling study design strategy, methods, laboratory requirements, quality assurance and quality control (QA/QC), and reporting.

[1] Or most recent version of the Management Plan.

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DOCUMENT CONTROL

Version	Date	Section	Page	Revision	Author
1	June 2018	All	All	Conceptual Plan developed for the Treated Groundwater Effluent Discharge into Melvin Bay	Golder Associates Ltd.
2	July 2019	All	All	Updated Plan to comply with applicable commitments and/or approval conditions for the Mine, including incorporation of the 2018 Marine Reconnaissance results, 2018 Modelling Assessment for groundwater discharge and per requirements under MDMER for water quality.	Golder Associates Ltd.
3	June 2020	All	All	General Plan update	Agnico Eagle Mines Ltd.
		2	4-11	Updated Plan to reflect the increased discharge to sea of 1600 m^3/day	
		3	13-14	Updated to include toxicity testing of the effluent	
4	September 2021	All	All	General Plan update	Agnico Eagle Mines Ltd.
		3	11	Updated Plan to reflect minor changes to FDP (MEL-26)	
		3	13	Updated Plan to reflect MDMER amendment	

ACRONYMS

Agnico Eagle	Agnico Eagle Mines Limited
BC MOE	British Columbia Ministry of Environment & Climate Change Strategy
CALA	Canadian Association for Laboratory Accreditation
CCME	Canadian Council of Ministers of the Environment
DDH	Diamond Drill Hole
CTD	Conductivity, Temperature, Depth
ECCC	Environment and Climate Change Canada
EEM	Environmental Effects Monitoring
FEIS	Final Environmental Impact Statements
FDP	final discharge point
Golder	Golder Associates Ltd.
GWMP	Groundwater Management Plan
IOL	Inuit Owned Lands
ISQG	Interim Sediment Quality Guidelines
MDMER	Metal and Diamond Mining Effluent Regulations
Mine or Project	Meliadine Gold Mine
NIRB	Nunavut Impact Review Board
NPC	Nunavut Planning Commission
NTU	Nephelometric Turbidity Units
NWB	Nunavut Water Board
ODMP	Ocean Discharge Monitoring Plan
QA/QC	Quality Assurance and Quality Control
RSA	Regional Study Area
SARA	Species at Risk Act
TDS	total dissolved solids
TGD	(Metal Mining) Technical Guidance Document
TSS	total suspended solids
UCLM	Upper Confidence Level of the Mean
WMP	Water Management Plan
WQG	water quality guideline

SECTION 1 • INTRODUCTION

Agnico Eagle Mines Limited (Agnico Eagle) operates the Meliadine Gold Mine (the Mine), located approximately 25 kilometres (km) north of Rankin Inlet, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut, on Inuit Owned Lands (IOL). The Mine is located within the Meliadine Lake watershed of the Wilson Water Management Area (Nunavut Water Regulations Schedule 4). There are four phases to the development of the Mine: just over 3.5 years of construction (2015 to 2019), 8.5 years of operations (2019 to 2027), 3 years of closure (2028 to 2030), and post-closure (2030 and forwards).

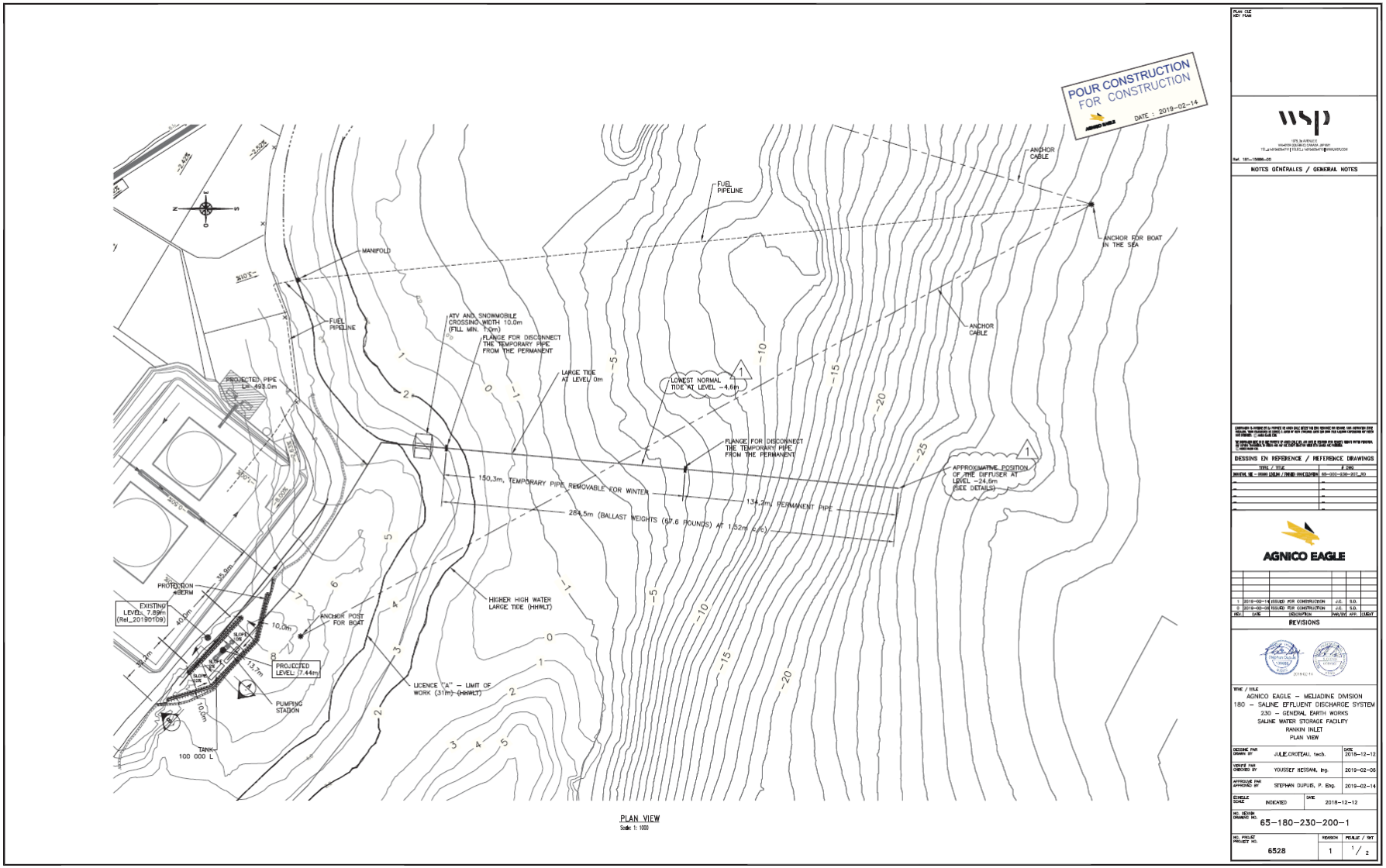
The mine plan includes underground mining methods for the development of the Tiriganiaq gold deposit. The underground mine will extend to approximately 625 m below the ground surface; therefore, part of the underground mine will operate below the base of the continuous permafrost. The underground excavations will act as a sink for groundwater flow during operation, with water induced to flow through the bedrock to the underground mine workings once the Mine has advanced below the base of the permafrost. Inflow of groundwater is expected from 2018 until the end of mine life.

The overall water management for the life of the Mine and post-closure is described in the WMP and the GWMP. The WMP provides descriptions of the Mine water control structures and associated design criteria, while the GWMP describes the short-, medium- and long-term groundwater management strategies, including storage of saline water on site and discharge to sea at Melvin Bay as per the Nunavut Impact Review Board (NIRB) Project Certificate 006 Amendment 001 (February 2019).

This document presents the Ocean Discharge Monitoring Plan (ODMP) for the discharge of excess treated groundwater into the marine environment at Itivia Harbour in Melvin Bay, to support medium- and long-term groundwater management for the Mine after treatment of the saline underground inflows to meet discharge water quality criteria for Melvin Bay and/or background conditions. This ODMP has been prepared in accordance with the NIRB Project Certificate No. 006 (Amendment 001) issued on February 26, 2019, and applicable legislation. As per the Metal and Diamond Mining Effluent Regulations (MDMER), the regulation applies to effluent discharge from a mine exceeding a flow rate of 50 cubic metres (m^3) per day.

The ODMP will be updated as the Mine development advances, to include changes and/or regulatory conditions as applicable through construction, operations and closure.

Figure 1: Site Layout – Itivia Fuel Storage Facility



SECTION 2 • RATIONALE FOR MONITORING APPROACH

The ODMP outlines management of the discharge of excess groundwater from the underground mine to the marine environment after treatment, during the life of the Mine to support long-term water management.

The ODMP focuses on water quality. No adverse effects are predicted from the marine discharge, based on the environmental conditions recorded, hydrogeological investigations and modelling assessments completed, adherence to existing management plans in addition to this ODMP, and the effects assessed in the FEIS Addendum (Agnico Eagle 2018b). This is based on the following rationale:

- Only excess groundwater from development of the underground mine will be discharged to Melvin Bay.
- Groundwater will be treated prior to discharge to comply with MDMER.
- Modelling assessment results indicate that compliance with the applicable discharge criteria will be met well within the mixing zone (i.e., discharge will meet relevant CCME and BCMOE guidelines, as well as background concentrations, in Melvin Bay as a result of diffusion well within the 100 m regulatory mixing zone) (Golder, 2019b).

Summaries of relevant information and studies identified above are presented in the following subsections.

2.1 Discharge Overview

Treated groundwater effluent is trucked to the discharge facility at the Itivia Fuel Storage Facility in Itivia Harbour, Rankin Inlet, for discharge during the open water season, between June and October. It should be noted that the discharge does not necessarily occur throughout the entire open water season. The maximum discharge rate is of 1,600 m^3/day[2], and truck loads are approximately 36 m^3 per truck. Further information on trucking can be found in the Roads Management Plan (Agnico Eagle, 2019b[3]).

The Itivia Fuel Storage Facility layout and outflow/diffuser placement are shown in Figure 1. The discharge facility includes a 778 m pipeline outflow extending to an engineered diffuser located in Melvin Bay. A truck discharge pump is connected to the 778 m long HDPE pipeline outflow. Ballast weights are attached to the pipe to sink and hold it onto the seabed. A diffuser is connected at the end of the pipe (approximately 20 m below surface) to ensure effective diffusion of the treated

[2] The trucking discharge rate of 1,600 m^3/day has been approved by the authorities for 2021, however, requires approval by the Nunavut Planning Commission (NPC) in future years.

[3] Or most recent version of the Management Plan.

groundwater effluent into the marine environment as per the Design Report: Saline Effluent Discharge to Marine Environment Upgrade (Design Report) (Agnico Eagle 2021c).

The treated groundwater effluent is discharged seasonally in a controlled manner, through a diffuser to allow for maximum dilution and minimum impact on the marine environment. The receiving environment discharge location is estimated at a distance of approximately 230 m from the shoreline and a depth of approximately 20 m. Treated groundwater effluent quality is required to meet the Canadian federal end-of-pipe discharge criteria (per the MDMER) and to be non-acutely lethal. Treated groundwater is discharged into Melvin Bay via an engineered diffuser (Agnico Eagle 2018b) to meet Canadian Water Quality Guidelines (WQG; CCME 2003), or background concentrations for parameters without guidelines, at the edge of the mixing zone (as described in Sections 3 and 4).

2.2 Environmental Conditions

The receiving environment for the effluent discharge is located in Melvin Bay, northwest Hudson Bay at Rankin Inlet. Hudson Bay, and particularly the area including Melvin Bay, is usually ice-covered from November to June and ice-free from July to October (Stewart and Lockhart 2005; Cohen et al. 1994).

- At Rankin Inlet, the tidal range varies between 2.0 and 4.6 m and mean currents flow southward at around 0.22 m/s. Isobath lines are nearly parallel to coastline and depth rapidly increases reaching more than 20 m within 230 m off the coast.
- Marine environmental baseline studies in the Melvin Bay area were conducted in August 2011 by Nunami Stantec (2012; see Appendix B of the FEIS Addendum, Agnico Eagle 2018b).
- Surveys were conducted at three areas in Melvin Bay: near the effluent discharge location (Impact Area 1 [I1]) and two reference areas, one (Reference Area 1 [R1]) located approximately 0.9 km northeast of Itivia Harbour, and the other (Reference Area 2 [R2]) on the southern shore of Melvin Bay, 1.5 m south from Itivia Harbour.
- Water quality measurements conducted by Nunami Stantec (2012) showed no water column stratification with the mean temperature ranging from 8.9°C at the surface to 8.5°C at the bottom (up to approximately 13 m depth), and the mean salinity ranging from 29.32 ppt at the surface to 29.33 ppt at the bottom. Water was well oxygenated with dissolved oxygen saturation ranging from 113.6 to 115.6% (10.8 to 11.2 mg/L). Nutrients and metals were mostly below detection limits and lower than the WQG for the Protection of Aquatic Life (Marine; CCME 2003).
- Sediments in the areas with water depths of up to 6.6 m were dominated by coarse material (cobble and gravel) in most samples (Nunami Stantec 2012).
- Sediment chemistry analysis of the fine substrate fraction revealed concentrations below CCME Interim Sediment Quality Guidelines (ISQG; CCME 2001) for all parameters except chromium. Chromium concentrations slightly exceeded the ISQG of 52.3 mg/kg for this element at all sample stations, with mean concentrations (plus/minus standard deviation) ranging from 55.8 ± 5.89 mg/kg at I1 to 60.2 ± 6.12 mg/kg at R2.

- In general, benthic invertebrate abundance and diversity in the area is low; in the intertidal zone, benthic communities occur seasonally when the habitat is not influenced by ice (Stewart and Lockhart 2005). Abundance in the subtidal habitat was also low in late summer (August), with most of the organisms observed less than 1 cm in length, suggesting a low biomass (Nunami Stantec 2012).
- Only six species of fish were identified during the baseline study in 2011 (Nunami Stantec 2012). Greenland cod (*Gadus ogac*) represented over 50% of fish captured, followed by slender eelblenny (27%) and minor contributions of different species of sculpins. Arctic char was not observed during the baseline field study, but was reported to be in the area at the time of the field study (west of Melvin Bay near the Barrier Islands).
- The baseline study conducted in 2011 indicated that most marine birds that occur in the vicinity of Rankin Inlet are summer residents and no marine bird species listed under the Species at Risk Act (SARA) occur near Rankin Inlet (Nunami Stantec 2012).
- Marine mammals potentially present in the north and northwest Hudson Bay for variable periods of time include 4 species of cetaceans (3 toothed whales and one baleen whale), 6 species of pinnipeds (seals and walrus), and polar bear (Shipping Management Plan, Agnico Eagle 2019c[4]). Polar bears (*Ursus maritimus* – Special Concern under SARA) are uncommon to the area. A summary of listed marine mammal species with potential to occur in the marine Regional Study Area (RSA) is provided in the Shipping Management Plan.

2.2.1 Marine Reconnaissance Survey Summary

A marine reconnaissance survey was carried out in September 2018 to establish appropriate reference areas and collect baseline data on physical properties of the water column, water and sediment quality, benthic substrate, benthic communities and marine mammal occurrence (Golder 2019a).

For the purpose of the ODMP, this section will focus on water quality results; however, sediment quality, benthic substrate and benthic community data are available in Appendix B. The program collected data from the exposure area and three reference areas (A, B and R1).

In situ profiles were taken using a conductivity, temperature and depth (CTD) probe. Uniform physical properties were observed in the water column, indicating well-mixed conditions with no vertical stratification. Water temperature was slightly lower near the bottom and ranged from 5.1 to 6.2°C, whilst salinity results ranged from 30.7 to 30.9 ppt. Water was clear, with turbidity usually between 1.2 and 2.4 NTU, and the exposure area and reference area R1 were slightly more turbid than reference areas A and B. A maximum turbidity was 6.1 NTU was observed at surface in reference area B, which could possibly be related to dust deposition. Chlorophyll *a* concentrations were typical

[4] Or most recent version of the Management Plan.

for Arctic waters, being classified as oligotrophic to mesotrophic marine systems (0.4 to 1.5 µg/L), consistent with total phosphorus results.

Total suspended solids (TSS) concentration varied between non-detect (<2 mg/L) to 3.8 mg/L, while total organic carbon concentrations were between 1.01 and 1.79 mg/L, with a large fraction of dissolved organic carbon. As observed in previous programs, results for several nutrients and most metals were below detection limits and did not exceed CCME guidelines. Variability in concentrations of detected metals was small, with greater variability recorded between sampling days. This observation emphasizes the well-mixed characteristic of the waters in Melvin Bay and adjacent areas, as well as similarity among areas. Similar oceanographic conditions were observed for reference areas A, B and R1 and the exposure area, and with the exception of R1, which is shallower, similar depth contours were also observed.

2.3 Hydrogeological Investigations

Supplemental hydrogeological investigations were undertaken in 2015 and 2016 to provide additional information on potential volumes and quality of saline groundwater inflows to the underground mine to be managed. The model was then subsequently updated in 2019 with piezometer data records and observed inflows intersected during drilling campaigns (GWMP). Maximum inflow rates to the Tiriganiaq Underground Mine are expected to be 580 m^3/day (Agnico Eagle,2021b).

Historically, groundwater investigations suggested that total dissolved solids (TDS) concentrations are relatively consistent below the permafrost at approximately 64,000 mg/L (Golder 2016). Groundwater quality samples have been collected from 2017 through 2019 from diamond drillholes (DDHs) intersecting water bearing structures. Results from the 146 samples collected from 2017 to 2019 indicate stable and consistent concentrations for several parameters and indicate that TDS concentrations are less than predicted at a mean concentration of 56,000 mg/L. Since mining operations include drill-and-blast excavation, certain parameters are expected to be influenced by explosives (particularly ammonia and nitrate). Chloride, sodium and calcium are also naturally high in concentration in the untreated groundwater, averaging higher concentrations than those recorded in Melvin Bay (Tables 1 and 2). Therefore, to minimize effects on the environment, and to comply with the effluent discharge criteria and objectives (as described in Section 3), groundwater is treated prior to discharge.

Table 1: Summary of Average Water Temperature and Salinity in Melvin Bay under Background Conditions and in Untreated Groundwater

Parameter	Averages	
	Melvin Bay	Untreated Groundwater
Temperature (°C)	5.92 to 8.75	-3.4 to +3.8 [(a)]
Salinity	30.7 to 30.9 psu	55 to 56 ppt [(b)]
Total Dissolved Solids (mg/L)	34,727	55,700

Source: Melvin Bay – 2018 Marine Reconnaissance data (Golder 2019a) and Nunami Stantec (2012). Mine Groundwater – Agnico Eagle 2017 data.

(a) Average temperatures per observations of Diamond Drill Hole (DDH) samples, as provided by Agnico Eagle. This does not account for the influence of ambient temperature for groundwater stored in containment ponds at the Mine.

(b) Estimated average groundwater salinity based on average TDS concentrations in groundwater presented in FEIS Addendum, Section 3.4.2, Table 3 (55,700 mg/L average TDS; Agnico Eagle 2018b). Salinity in groundwater has not been measured. TDS values are comparable to salinity as TDS represents an estimate of the total concentration of ions, typically salt ions, that are present in the water. This may, however, overestimate the salinity of the untreated groundwater, as TDS also includes organic solutes (for example, hydrocarbons and urea) in addition to salt ions. Note on units for salinity – in practice the units of psu and ppt are considered the same (nearly equivalent by design).

Table 2: Summary of Average Concentrations of Selected Ions in Melvin Bay under Background Conditions and in Untreated Groundwater

Ion	Averages	
	Melvin Bay	Untreated Groundwater[(a)]
Chloride (Cl) - (mg/L)	16,655 to 20,000	32,315
Sodium (Na) - Total (mg/L)	9,344 to 11,000	14,365
Calcium (Ca) - Total (mg/L)	360	2,032

Source: Melvin Bay - 2018 Marine Reconnaissance data (Golder 2019a) and Nunami Stantec (2012). Mine Groundwater– Agnico Eagle 2017 data (Agnico Eagle 2018b).

(a) Averages per untreated groundwater concentrations presented in FEIS Addendum, Section 3.4.2, Table 3 (Agnico Eagle 2018b).

2.4 Modelling Assessments

The assessment of effects in the FEIS Addendum (Agnico Eagle 2018b) used a numeric simulation to model behaviour of the effluent plume in the marine environment (refer to Appendix E of the FEIS Addendum, Agnico Eagle 2018b). This model showed that a discharge of 420 m^3/day effluent through the diffuser will reach the required dilution factor within a short distance from the diffuser port (within 1 to 3 m). The plume is characterized by negative buoyancy and the maximum plume height expected is about 14 m above the seabed.

The assessment concluded that the treated groundwater discharge through the diffuser would result in a minor environmental change, but would have a negligible residual effect on fish and fish habitat and marine birds and marine mammals relative to baseline or guideline values provided that mitigation measures are in place. Mitigation measures include treatment of groundwater to meet regulatory discharge criteria (particularly the MDMER), discharge through a diffuser that aids in mixing, and implementation of the water quality monitoring per MDMER Schedule 5 Section 7(1).

A modelling assessment was conducted in February 2019 (Golder 2019b), consisting of nearshore oceanographic modelling of the discharge and is presented in Appendix C. The study had the objective of modelling the near-field dispersion of the treated groundwater effluent plume and assessing the plume dilution behavior for additional discharge scenarios from those evaluated for the FEIS Addendum, and did not include geotechnical, structural or hydraulic engineering assessments of the outfall. The scenarios modelled assumed the discharge at the quantities and qualities per the estimated underground inflow volumes (Golder 2016) and estimated groundwater inputs to surface storage for management after treatment and transport to the Itivia Fuel Storage Facility.

Discharge conditions for modelling took into account marine environment temperatures during open water conditions (assumed at 0°C conservatively to account for the early and late stages of the open water season), outfall lengths and water depth at discharge location, single diffuser nozzle elevated above the seabed, direction of discharge (upward port), and treated groundwater effluent temperature.

The model input for effluent discharge rate was applied at 800 m^3/12 hours (for an equivalent of 1,600 m^3/day). Modelling for weak and mean current conditions was completed, including a temperature sensitivity analysis simulation for a treated groundwater effluent temperature of 20°C and marine environment temperature of 8.5°C. Temperature sensitivity was analyzed to account for changing ambient conditions in the ocean water and to account for the highest possible (though not likely) possible effluent temperature.

Results from the modelling assessment indicated that, under all scenarios, the plume centerline dilution factor reaches the desired dilution factor of 11 within a short distance from the diffuser port (Golder 2019b). In summary, the results show that:

- The required dilution is met within 1 m horizontal and 6 m vertical distance from the diffuser, under the assumed conditions (including sensitivity analysis for temperature variation).
- The plumes rise higher in the water column as discharge temperatures increase due to slight reductions in density (reduced negative buoyancy).
- At a flow rate of 800 m^3/12 hours or 1,600 m^3/day, the dilution factors at 100 m from the diffuser are increased due to accelerated plume mixing due to higher discharge velocities.
- After initial mixing, the plume migrates along the seabed under gravity and achieves further dilution and mixing with ambient water; concentrations within the 100 m regulatory mixing zone will thus meet discharge criteria per regulatory requirements and/or background concentrations for non-regulated parameters, per the modelled conditions.
- The modelling results are considered to be valid for placement of the diffuser in Melvin Bay in water depths of at least 20 m.

2.5 Project Management Plans

Agnico Eagle has developed Management Plans that are applicable to the Mine site, the All-Weather Access Road (AWAR), and the Itivia Fuel Storage Facility.

Table 3 lists the management plans for the Mine as they apply for the ocean discharge.

Table 3: Project Management Plans Applicable to the Ocean Discharge Activities

Management Plan[1]
Risk Management and Emergency Response Plan
Hazardous Materials Management Plan
Spill Contingency Plan
Water Management Plan
Mine Waste Management Plan
Roads Management Plan
Groundwater Management Plan
Shipping Management Plan (including the Marine Environmental Management Plan as Appendix D)
Ocean Discharge Monitoring Plan

Notes:

[1] Updated management plans are resubmitted to the NIRB and the NWB as appropriate, in compliance with respective NIRB Project Certificate No. 006 or NWB Type A Amended Water Licence (No. 2AM-MEL1631, 2021) terms and conditions, as adaptive management measures or changes are applied as the Project develops.

2.6 Potential Effects

The potential effects from the discharge of treated groundwater effluent to the marine environment were assessed in the FEIS Addendum (Agnico Eagle 2018b). Effect pathways specific to the treated groundwater effluent discharge activity assessed included the following:

- Change in fish and benthic invertebrate habitat quality due to discharge of groundwater effluent.
- Change in health and survivorship of fish (including benthic invertebrates) due to the quality of the groundwater effluent discharge.
- Change in marine bird and mammal habitat quality due to the quality of the groundwater effluent discharge.
- Change in health and survivorship of marine birds and mammals due to the quality of the groundwater effluent discharge.
- Change in water quality of the marine environment due to the quality of the groundwater effluent discharge.
- Accidental release of groundwater effluent from an unknown location along the discharge pipe can have adverse effects on marine water quality and associated indirect effects on marine wildlife (fish, benthic invertebrates, marine birds, marine mammals).

Groundwater is treated prior to discharge to comply with the effluent discharge criteria (refer to Section 3). These criteria are set to be protective of marine aquatic life. For parameters with no regulated guidelines for discharge, the discharge concentration objectives conservatively considered for the assessment were 95% of the Upper Confidence Level of the Mean (UCLM) for groundwater. For most parameters, these are below baseline concentrations at Melvin Bay, whereas 11 parameters are expected to exceed baseline concentrations.

SECTION 3 • MONITORING DESIGN

The following are the main components of the ODMP:

- Effluent monitoring at the Final Discharge Point (FDP; end-of-pipe monitoring), to verify compliance of saline groundwater properties with the discharge criteria and to characterize effluent quality under MDMER.
- Environmental effects monitoring to assess short- and long-term effects to water quality from the discharge of treated groundwater effluent on marine environment (Receiving Environment, Exposure Area and Reference Area A), in relation to CCME and BCMOE guidelines as well as background concentrations.

The objectives of the ODMP are to:

- Comply with applicable regulatory requirements.
- Detect short- and long-term effects of the discharge on the receiving environment based on the results obtained, and identify unforeseen adverse effects and provide early warnings of undesirable changes in the water quality.
- Inform mitigation through adaptive management measures, as appropriate, based on the results and trends observed.

Table 4: Ocean Discharge Monitoring Program – Monitoring Location

Description	Location	Centroid Location Coordinates (NAD 83)
Final Discharge Point (FDP; end-of-pipe monitoring)	MEL-26, Sampling Valve (downstream of the filtration system)	62°48’01.99” N 92°06’00.05” W[1]
Receiving Environment	MWE-1, Diffuser Location	62°47’48.43” N 92°05’53.10” W
Exposure Area	Melvin Bay	62°47’49.24” N 92°05’52.97” W
Reference Area A	Melvin Bay	62°46’55.38” N 92°07’01.43” W

[1]It should be noted the FDP sampling point location changed slightly as per the updated Design Report (2021); however, the GPS coordinates remain the same.

A summary of monitoring components, sampling frequency and design is provided in Table 5.

Table 5: Ocean Discharge Monitoring Program – Sampling Summary

Monitoring Component	Sampling Frequency	Monitoring Location	Sample Replication and Number of Samples
Deleterious Substances (MDMER Schedule 4)	Once per week	▪ FDP	One grab sample.
Effluent Characterization	Four times a year, at least one month apart, during discharge	▪ FDP	One grab sample.
In situ Water Column Measurements	Four times a year, once a month during discharge	▪ Receiving Environment ▪ Exposure Area ▪ Reference Area A	7 stations in the Receiving Environment and Exposure Area, 3 stations in Reference Area A. One vertical profile per station.
Water Quality	Four times a year, once a month during discharge	▪ Receiving Environment ▪ Exposure Area ▪ Reference Area A	7 stations in the Receiving Environment and Exposure Area, 3 stations in Reference Area A. One sample at 1 m below the surface and one sample at 5 m above the bottom at each station.
Acute lethality	Every month (sampled concurrently with effluent characterization)	▪ FDP (end-of-pipe)	One grab sample
Sublethal toxicity	Twice a year, at the start and finish of the discharge	▪ FDP (end-of-pipe)	One grab sample

Notes:
Sampling requirements per Metal and Diamond Mining Effluent Regulations (MDMER).
FDP = Final Discharge Point (end of pipe).
Receiving Environment = Diffuser Location.

3.1 Effluent Monitoring

Prior to haulage of saline water from the Meliadine Site to Itivia for discharge to sea over the open water season, Agnico Eagle measures pH, specific conductivity, and temperature of the effluent as a means to continually advise discharge operations and help ensure discharge parameters are met. Agnico Eagle also collects samples over the open water season which are sent for analysis by an accredited laboratory as per MDMER requirements.

3.1.1 Deleterious Substances

Effluent water at the FDP (end-of-pipe) is measured for dissolved oxygen, pH, temperature and specific conductivity per MDMER, and analysed for concentrations of deleterious substances listed in MDMER Schedule 4 once per week during discharge.

3.1.2 Acute Lethality

End-of-pipe effluent is sampled once per month over the open water season for acute lethality testing per MDMER requirements. Acute lethality testing is conducted on Three-spine stickleback in

accordance with the procedures set out in sections 5 or 6 of Reference Method EPS 1/RM/10 (ECCC 20188). Acute lethality testing will also be conducted on *Acartia tonsa* in accordance with the procedures set out in section 5 or 6 of Reference Method STB 1/RM/60 once the amendments to MDMER come into force on December 1st, 2021. Effluent characterization samples (Section 3.1.3) are collected at the same time to aid in interpretation of acute lethality test results.

3.1.3 Effluent Characterization

Effluent characterization is conducted at least one month apart, four times a year. Effluent is sampled and analysed for the following parameters:

- General parameters, including pH, TDS, total suspended solids, hardness, alkalinity, specific conductivity, salinity and temperature;
- anions including sulphate and chloride;
- nutrients, including phosphorus and nitrate;
- total metals, including those listed in MDMER Schedule 5, paragraph 4 (1).

3.1.4 Sublethal Toxicity Testing

Sublethal toxicity testing of effluent is conducted twice a year at least one month apart, at the beginning and at the end of discharge for three years, and once a year after the third year. The following tests are conducted:

- Fish early life stage development test on inland silverside (Menidia beryllina) or topsmelt (Atherinops affinis) (US EPA 2002)
- Invertebrate reproduction test on echinoids (sea urchins or sand dollars) (Environment Canada 1992)
- Algae toxicity test on giant kelp (Macrocystis pyrifera) (US EPA 1995).

These tests are conducted on aliquots of the same sample collected for effluent characterization. It should be noted that species for sublethal toxicity testing could change, for example if logistical issues are encountered (such as unavailable specie or hold time issue). The species will meet MDMER requirements.

3.2 Water Quality Monitoring

Agnico Eagle adheres to MDMER EEM requirements for water quality assessments outlined in Table 5. Overall, samples are collected four times a year, at least one month apart during discharge, at seven stations in the exposure area and three stations in reference area A. Further details on sampling and analytical requirements are provided below.

3.2.1 Sampling Locations and Depths

Current sampling locations are based on the diffuser location provided to ECCC on April 29, 2019 in compliance with the MDMER for a new discharge point. The central coordinates for the monitoring

locations are presented in Table 6 for the Receiving Environment, the Exposure Area and the Reference Area A. Locations are sampled based on the following rationale:

- One station at the Receiving Environment location to characterize water quality at the point of the discharge.
- Four stations at 100 m in the Exposure Area – these stations are at the edge of the mixing zone and can be downstream of the Receiving Environment discharge point depending on current direction (i.e., tidal and wind-driven).
- Two stations at 250 m in the Exposure Area – as per MDMER Schedule 5, these are additional stations to estimate concentration of effluent in the Exposure Area at 250 m from the discharge point.
- Two water depths are sampled at each station to account for horizontal and vertical dispersion of the discharge plume due to oceanographic conditions of water column structure, e.g., horizontal and vertical currents, mixing/stratification. These are 1 m below the water surface and 5 m above the bottom.

At Reference Area A, three sampling stations are visited to comply with the recommended minimum requirement to account for variability, as per the Metal Mining Technical Guidance Document (TGD; GC 2012). As in the Exposure Area, samples are collected from two depths at each sampling station.

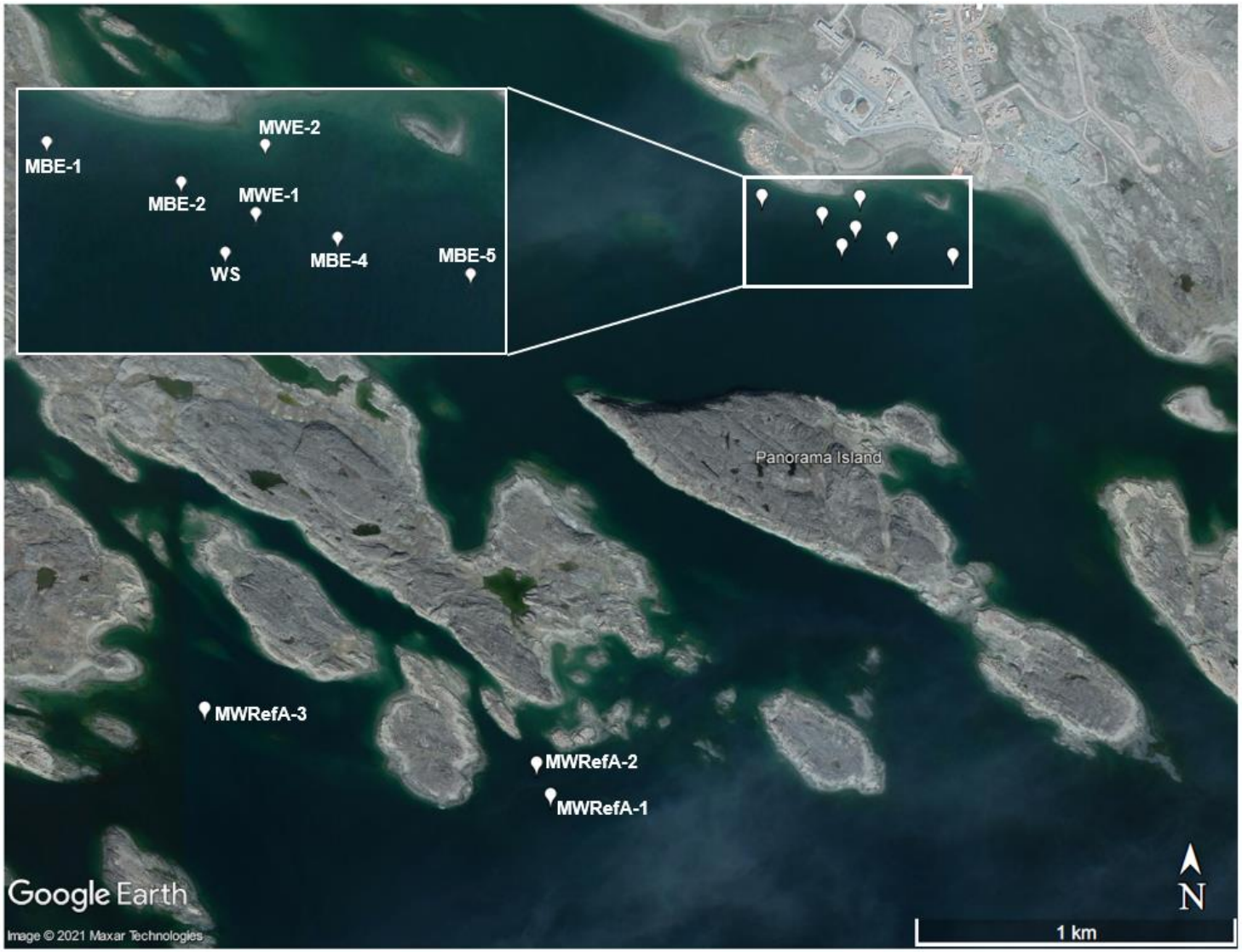
Coordinates for the Exposure Area and the Reference Area A are provided below in Table 6 and Figure 2.

Table 6: List of Sampling Stations and Coordinates in Melvin Bay

Sampling Area	Station Name	UTM Coordinates NAD 83 Zone 15		Geographical Coordinates System NAD 83	
		Easting (m)	Northing (m)	Longitude (°)	Latitude (°)
Receiving Environment (Discharge Point)	MWE-1	546002	6963295	-92.0980	62.7970
Exposure Area	WS	545960	6963239	-92.0989	62.7965
	MWE-2	546014	6963391	-92.0978	62.7979
	MBE-1	545708	6963391	-92.1038	62.7979
	MBE-2	545897	6963337	-92.1001	62.7974
	MBE-4	546117	6963262	-92.0958	62.7967
	MBE-5	546304	6963213	-92.0922	62.7962
Reference Area A	MWRefA-1	545070	6961511	-92.1168	62.7811
	MWRefA-2	545025	6961609	-92.1176	62.7820
	MWRefA-3	543985	6961768	-92.1380	62.7836

Notes: UTM = Universal Transverse Mercator coordinate system; NAD 83 = North American Datum 83.

Figure 2: Ocean Discharge Monitoring Plan – Marine Sampling Stations



AGNICO EAGLE

3.2.2 Field and Laboratory Requirements

To be compliant with all requirements from the MDMER and provide sufficient information for the interpretation of the results, *in situ* profile measurements are taken with a CTD probe at every water quality sampling station to assess water column physical properties (i.e., temperature, salinity, and turbidity). Dissolved oxygen point measurements are taken to adhere to MDMER requirements.

Samples are stored in clean laboratory-provided containers, preserved accordingly and sent to accredited commercial laboratories for analysis as quickly as feasible. For parameters with short hold-time requirements (i.e., 72 h or less: pH, turbidity, ammonia, nitrate, nitrite or toxicity tests), hold-time exceedances are expected to occur.

Laboratory analysis follow the MDMER detection limit requirements as per Schedule 3 and include deleterious substances listed in Schedule 4 and Schedule 5 paragraph 4(1), as well as other metals and additional parameters recommended by TGD (GC 2012).

3.3 Quality Assurance/Quality Control (QA/QC)

Quality assurance (QA) refers to plans or programs that encompass a wide range of internal and external management and technical practices designed to ensure the collection of data of known quality that matches the intended use of the data. Quality control (QC) is a specific aspect of QA that refers to the internal techniques used to measure and assess data quality.

Quality assurance protocols is followed so data are of known, acceptable, and defensible quality. To make certain that field data collected are of known, acceptable, and defensible quality, field staff are trained to be proficient in standardized sampling procedures, data recording using standardized forms, and equipment operations applicable to the monitoring program. Field work will be completed according to specified instructions and established technical procedures for sample collection, preservation, handling, storage, and shipping. Canadian Association for Laboratory Accreditation (CALA) accredited laboratories will be selected for sample analysis. Accreditation programs are utilised by the laboratories so that performance evaluation assessments are conducted routinely for laboratory procedures, methods, and internal quality control. A data management system is utilized so that an organized consistent system of data control, data analysis, and filing will be applied to the program.

The QC component consists of applicable field and sample handling procedures, and the preparation and submission of two types of QC samples for laboratory analysis: blank and duplicate samples. QC samples will be collected as per current Quality Assurance/Quality Control Plan, Agnico Eagle 2019d[5].

[5] Or most recent version of the Plan.

SECTION 4 • BENCHMARKS AND DIFFERENCE CRITERIA

This section sets quality benchmarks and difference criteria against which the effluent and/or the marine environment will be monitored, and whose exceedance will be considered to indicate effects of the treated effluent discharge. The following criteria are discussed:

- A benchmark is a set concentration of a substance in water that is expected to be protective of aquatic life, e.g., CCME WQGs for the protection of aquatic life.
- A difference criterion is a magnitude of environmental change, which, if reached, indicates a change outside of background variability. As per the TGD (GC 2012), a factor of two will be used as difference criteria for water quality parameters when comparing exposure data to reference or baseline.

4.1 Effluent Monitoring

The benchmarks applicable for effluent monitoring (i.e., end-of-pipe) for deleterious substances are the authorized limits outlined in Schedule 4 of the MDMER.

In compliance with MDMER Section 14.2 groundwater effluent is not expected to be acutely lethal to threespine stickleback. As previously indicated, the groundwater effluent is treated prior to discharge in compliance with MDMER requirements, and the modelling assessment (Section 2.4) shows that the required dilution is met well within the regulatory mixing zone from the diffuser, under the assumed conditions. If the salinity value of the effluent is equal to or greater than ten parts per thousand, the mine will evaluate whether the effluent is acutely lethal by conducting an acute lethality test in accordance with the procedures set out in section 5 or 6 of Reference Method EPS 1/RM/10.

4.2 Water Quality

The benchmarks used for water quality variables in the receiving environment are water quality guidelines currently in effect, consisting of the CCME WQG for the Protection of Marine Aquatic Life, British Columbia Ministry of Environment & Climate Change Strategy (BC MOE 2019) Approved WQG for Marine Aquatic Life (Short-Term) and BC MOE Working WQG for Marine Aquatic Life (BC MOE 2021) at the edge of the mixing zone, located 100 m from the diffuser.

For parameters for which no WQGs exist, concentrations from the exposure area will be compared to baseline concentrations and concentrations in the reference area.

Concentration of a parameter will be considered elevated in the exposure area in comparison to baseline or reference area data based on a difference of more than a factor of two. A factor of two is recommended to ensure that differences observed are real differences, rather than a result of background or analytical variation (GC 2012).

-

SECTION 5 • REPORTING

Reporting will include the raw data obtained during sampling programs, as well as data interpretation, graphical presentation and comparison to applicable guidelines, baseline data and literature data, where applicable. Monitoring results will be integrated to evaluate the presence and overall direction of change to marine water quality. Report structure will be in compliance with applicable MDMER reporting requirements.

Reports will be prepared and delivered to Environment and Climate Change Canada (ECCC, as per the MDMER requirements), and to NIRB and NWB annually following the discharge of treated groundwater effluent to the marine environment. Reports will be available on the respective public registries for regulator and stakeholder review and input.

SECTION 6 • REFERENCES

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APPENDIX A – SALINE EFFLUENT DISCHARGE SYSTEM CONSTRUCTION DRAWINGS

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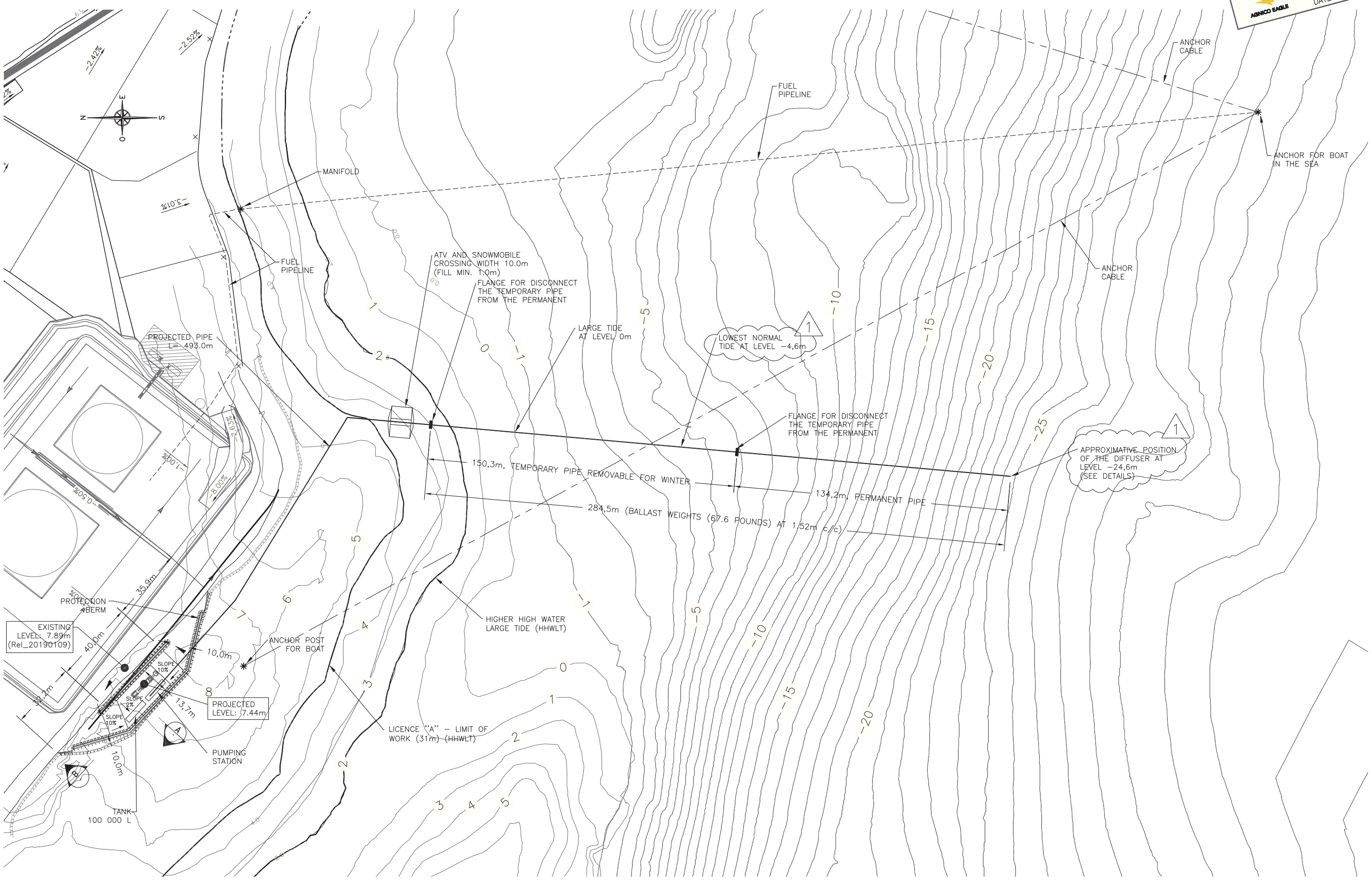

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POUR CONSTRUCTION
FOR CONSTRUCTION
DATE : 2019-02-14

PLAN CLÉ
KEY PLAN

wsp
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VAL-D'OR (QUÉBEC) CANADA J9P 6M1
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NOTES GÉNÉRALES / GENERAL NOTES

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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
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0	2019-02-06	ISSUED FOR CONSTRUCTION	J.C.	S.D.	

REVISIONS

Stéphan Dupuis 139669 QUÉBEC
S. DUPUIS LICENSEE NT/NU
2019-02-14

TITRE / TITLE
AGNICO EAGLE - MELIADINE DIVISION
180 - SALINE EFFLUENT DISCHARGE SYSTEM
230 - GENERAL EARTH WORKS
SALINE WATER STORAGE FACILITY
RANKIN INLET
PLAN VIEW

DESSINÉ PAR / DRAWN BY	JULIE.CROTEAU, tech.	DATE 2018-12-12
VERIFIÉ PAR / CHECKED BY	YOUSSEF HESSANI, Ing.	2019-02-06
APPROUVÉ PAR / APPROVED BY	STEPHAN DUPUIS, P. Eng.	2019-02-14
ÉCHELLE / SCALE: INDICATED	DATE	2018-12-12

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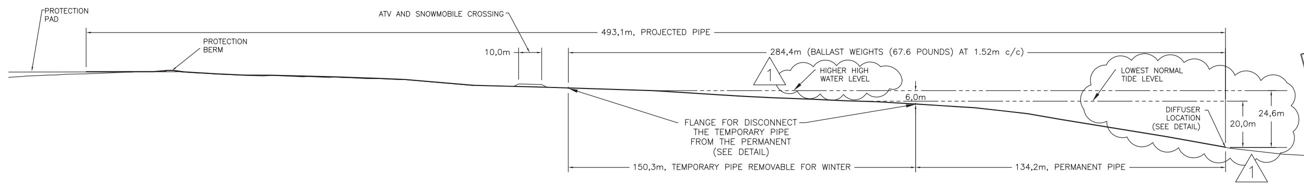

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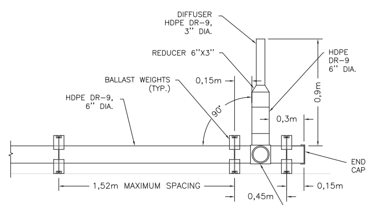
FOR CONSTRUCTION
DATE : 2019-02-14



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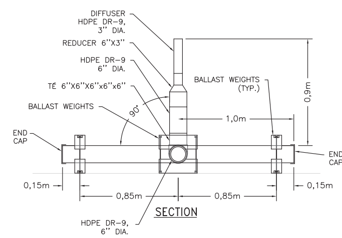

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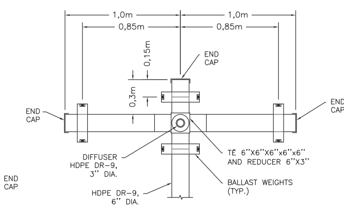

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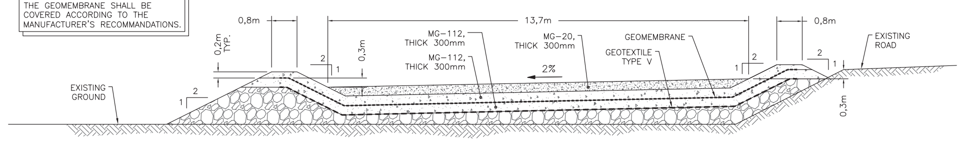

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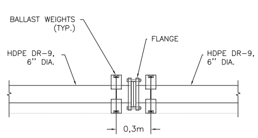

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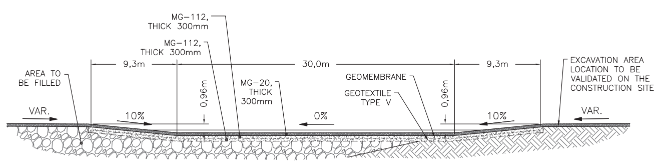

SECTION "B" – PAD

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NOTES:

1) FOR THE INSTALLATION, THE CONTRACTOR NEED TO REFER TO THE HANDBOOK OF PE PIPE CHAPTER 10, MARINE INSTALLATION. EACH SECTION OF PIPE MUST BE JOINT BY FUSION, EXCEPT FOR THE TEMPORATY PIPE REMOVABLE FOR WINTER THEY ARE CONNECTING TO THE PERMANENT PIPES WITH FLANGE FUSED AT EACH END BACK-UP RING.

2) POST-INSTALLATION SURVEY

UPON COMPLETION OF THE INSTALLATION OF A SUBMERGED PIPELINE, IT IS ADVISABLE TO HAVE THE COMPLETE LINE SURVEYED BY A COMPETENT DIVER TO ENSURE THAT:

- THE PIPELINE IS LOCATED WITHIN THE PRESCRIBED RIGHT-OF-WAY;
- THE BALLASTS HOLDING THE PIPELINE ARE ALL PROPERLY SITTING ON THE BOTTOM CONTOUR AND THAT THE LINE IS NOT FORCED TO BRIDGE ANY CHANGES IN ELEVATION;
- THE PIPE IS NOT RESTING ON ANY ROCKS, DEBRIS OR MATERIAL THAT COULD CAUSE DAMAGE;
- ANY AUXILIARY LINES, SUCH AS HOSES, ROPES, BUOYANCY BLOCKS OR ANY OTHER EQUIPMENT USED DURING THE INSTALLATION HAS BEEN REMOVED;
- WHERE REQUIRED, THE PIPE HAS BEEN BACKFILLED AND THE BACKFILLING WAS DONE PROPERLY;
- ALL OTHER INSTALLATION REQUIREMENTS ESTABLISED BY THE DESIGNER FOR THE SUBJECT APPLCATION HAVE BEEN COMPLIED WITH.

PLAN CLÉ / KEY PLAN

wsp

1075, 3e AVENUE E. VAL-D'OR (QUÉBEC) CANADA J9P 0B1
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NOTES GÉNÉRALES / GENERAL NOTES

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0	2019-02-06	ISSUED FOR CONSTRUCTION	J.C.	S.D.	

REVISIONS

Stéphan Dupuis 139686 QUÉBEC 2019-02-14

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
180 – SALINE EFFLUENT DISCHARGE SYSTEM
230 – GENERAL EARTH WORKS
SALINE WATER STORAGE FACILITY
RANKIN INLET
DETAILS

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VÉRIFIÉ PAR / CHECKED BY	YOUSSEF HESSANI, Ing.	2019-02-06
APPROUVÉ PAR / APPROVED BY	STEPHAN DUPUIS, P. Eng.	2019-02-14
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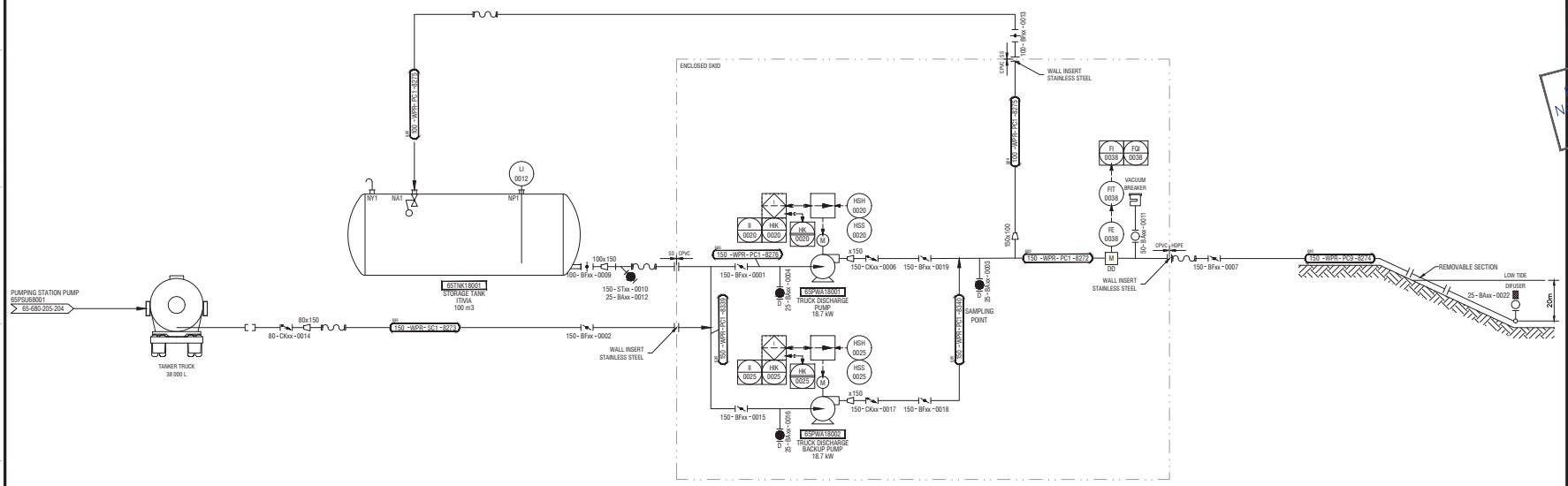

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180 – SALINE EFFLUENT DISCHARGE SYSTEM
205 – PIPING & INSTRUMENTATION DIAGRAM
RANKIN INLET
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VÉRIFIÉ PAR CHECKED BY	SÉBASTIEN PERRON	2019-02-07
APPROUVÉ PAR APPROVED BY	ÉRIC LAVOIE, P. Eng.	2019-02-07
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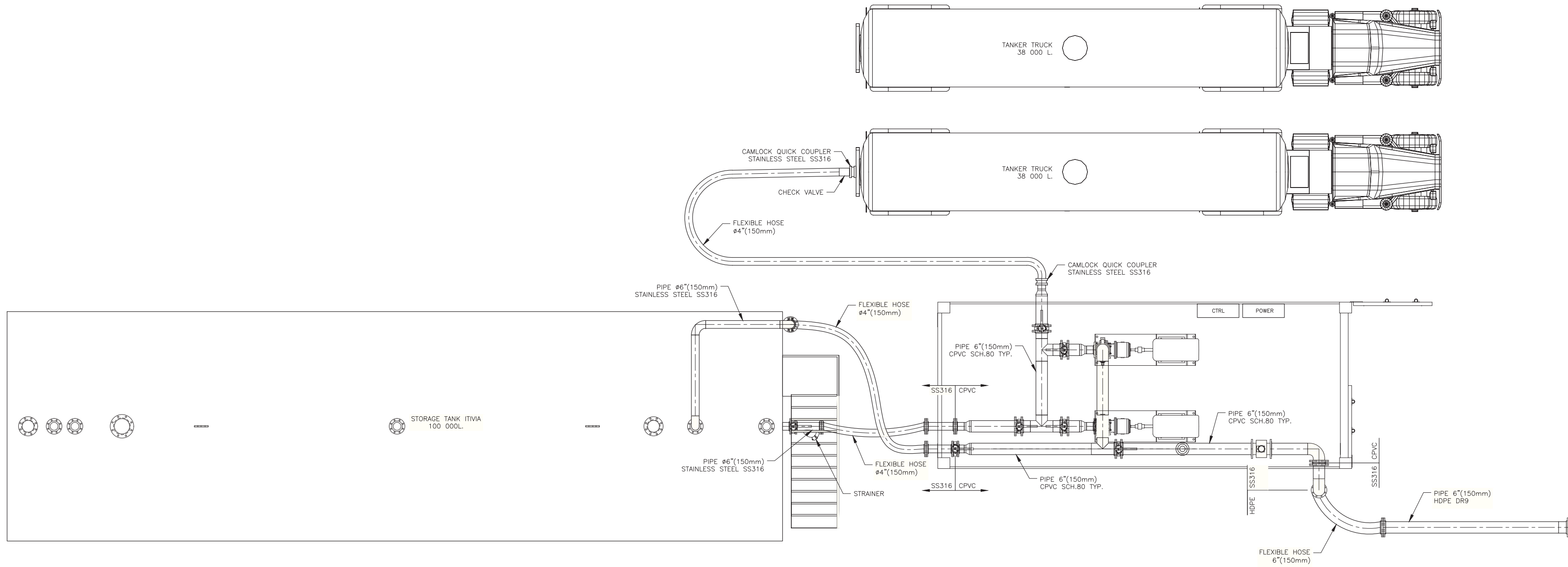

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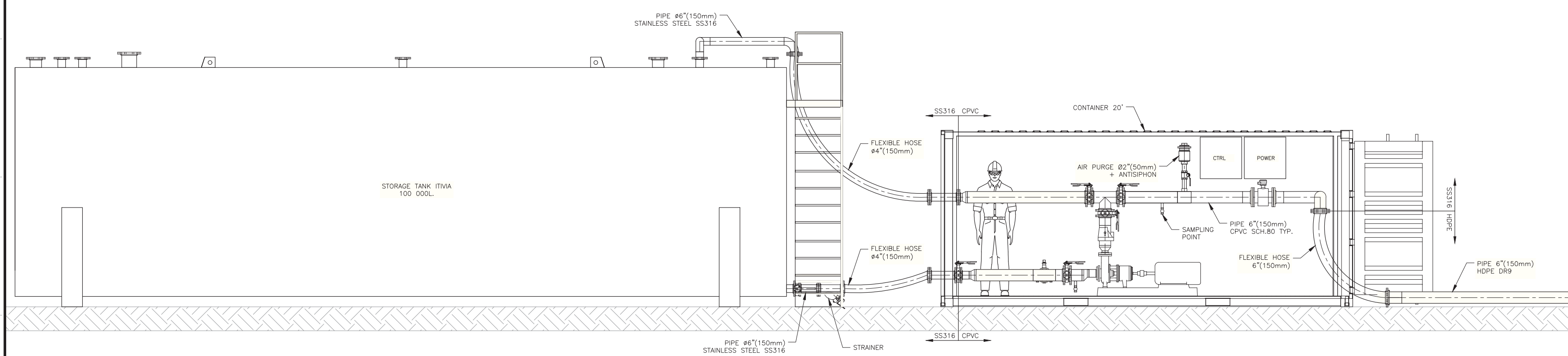

ELEVATION VIEW – SALINE EFFLUENT DISCHARGE SYSTEM
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KEY PLAN

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Ref. 181-15686-00

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NOT FOR CONSTRUCTION
DATE : 2019-02-05

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Dominique Richard
5034681
QUÉBEC

REGISTERED PROFESSIONAL ENGINEER
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NT/NU
L 4044

TITRE / TITLE
AGNICO EAGLE – MELIADINE DIVISION
180 – SALINE EFFLUENT DISCHARGE SYSTEM
210 – GENERAL ARRANGEMENT
RANKIN INLET
ITIVIA

DESSINÉ PAR / DRAWN BY	CLAUDIA GILBERT	DATE 2019-01-30
VERIFIÉ PAR / CHECKED BY	SYLVAIN DÉFOSSÉ	2019-02-05
APPROUVÉ PAR / APPROVED BY	DOMINIQUE RICHARD, Eng.	2019-02-05
ÉCHELLE / SCALE	INDICATED	DATE 2019-01-30

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APPENDIX B – MARINE RECONNAISSANCE PROGRAM 2018

REPORT

Meliadine Gold Mine Ocean Discharge Monitoring Plan - Marine Reconnaissance and Baseline Programs

2018 Marine Reconnaissance Survey Data Report

Submitted to:

Martin Theriault
Agnico Eagle Mines Limited
Meliadine Division, Nunavut, Canada
X0C 0G0

Submitted by:

Golder Associates Ltd.
2nd floor, 3795 Carey Road, Victoria, British Columbia, V8Z 6T8, Canada

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Doc707-18103567

February 2019

Distribution List

One electronic copy to Agnico Eagle Mines Ltd.

One electronic copy to Golder Associates Ltd.

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1.0 INTRODUCTION

As described in the Final Environmental Impact Statement Addendum (FEIS Addendum; Agnico Eagle 2018), to support long-term groundwater management for the Mine, Agnico Eagle has proposed to directly discharge excess groundwater effluent into Melvin Bay, after treatment to meet discharge water quality criteria for Melvin Bay and/or background conditions.

The conceptual Ocean Discharge Monitoring Plan (ODMP), included in the FEIS Addendum (as Appendix E; Agnico Eagle 2018), outlines objectives, rationale, and details for protection of water/sediment quality and biological components on the marine environment in Melvin Bay. The ODMP will align with Environmental Effects Monitoring (EEM) study design requirements per Metal and Diamond Mine Effluent Regulations (MDMER; SOR/2002/222). The proposed EEM design for treated groundwater discharge to Melvin Bay is based on a before/after, control/impact (BACI) approach with monitoring studies conducted in the exposure (impact) and reference (control) areas. As per of the EEM design, potential changes to water and sediment quality caused by the effluent discharge and the effect of these changes to aquatic life, fish habitat, and fish health are identified by comparing data collected from the exposure area during monitoring studies to data from reference areas and to baseline (pre-discharge) conditions.

Golder was retained by Agnico Eagle to conduct marine environmental reconnaissance surveys in Melvin Bay to establish appropriate reference areas and collect preliminary baseline data on physical properties of the water column, water and sediment quality, benthic substrate, benthic communities (infauna[1], epifauna[2] and epiflora[3]), and marine mammal occurrence.

1.1 The Purpose and Scope of Work

The purpose of the reconnaissance survey was to:

- Establish reference area(s) that have similar physical and ecological characteristics as the exposure area (i.e., similar water depth and substrate), but located outside of the influence of the treated effluent discharge or other confounding factors.
- Update previously collected baseline data on the marine and coastal environment.

Marine baseline studies were previously conducted for the Mine in Itivia Harbour and involved gathering of environmental data in an exposure and two reference areas (Nunami Stantec 2012). However, the surveys targeted shallower depths (up to 9 m shallower) than that of the discharge location, therefore, the survey locations and data gathered were considered not suitable as reference areas for the purpose of future environmental effects monitoring for treated groundwater effluent discharge.

The 2018 reconnaissance survey consisted of collection of data on physical properties of water column and limited sampling of water, sediments and benthic infauna in the exposure and candidate reference areas selected during a desktop review, as well as bio-physical surveys of the intertidal zone and observations of marine mammal occurrence.

[1] Infauna - organisms living in the substrate of the seafloor (e.g., polychaete worms, clams).
[2] Epifauna – organisms living on the seafloor (e.g., sea stars, crabs).
[3] Epiflora – vegetation living on the sea floor.

2.0 MATERIALS AND METHODS

2.1 Desktop Review

A preliminary desktop review was completed prior to undertaking fieldwork and consisted of a review of the existing baseline report (Nunami Stantec 2012) and the satellite, topographic and navigation maps of Melvin Bay and adjacent areas of western Hudson Bay. The purpose of the review was to identify candidate reference area(s) based on the following criteria:

- similar topographic and bathymetric features to the location of the proposed diffuser in Melvin Bay (the exposure area);
- safe and unhindered access by a boat;
- relatively short distance from the exposure area, so the reference area(s) would have similar environmental characteristics and would be exposed to similar natural influences; and
- located outside of the potential zone of influence from the engineered diffuser and other anthropogenic factors.

Four candidate reference areas as well as a reference area previously surveyed by Nunami Stantec were selected based on the above criteria and are shown on Figure 1.

2.2 Field Program

The 2018 marine reconnaissance survey was conducted from 10 to 20 September 2018 by two Golder scientists using an 18-foot aluminium boat (Figure 3). The main purpose of the survey was to collect preliminary physical and ecological data and investigate whether the candidate reference areas were suitable for future marine EEM.

2.2.1 Study Areas

The reconnaissance surveys were conducted in the Exposure Area and three reference areas (A, B and R1) (Figure 2). Reference areas C and D (Figure 1) were not surveyed; Reference Area C was located at a distance that could not be safely accessed compared to Areas A and B, and Reference Area D was located in an area with high wind and wave exposure.

Exposure Area surveys were focused primarily at the future location of the proposed discharge pipe and diffuser near the existing Itivia Harbour fuel storage facility at a depth of 20 m in Melvin Bay. Surveys included water column profiling, water and sediment quality sampling, benthic infauna sampling, intertidal surveys and marine mammal observations (Table 1).

Reference areas A and B included water column profiling, water and sediment quality sampling, and benthic infauna sampling. A depth of 20 m (the depth of the proposed discharge diffuser) was selected for monitoring of sediment quality and benthic infauna community composition to avoid influence of depth as a potential factor affecting the monitoring endpoints.

Reference Area R1 had previously been surveyed in 2012 (Nunami Stantec 2012). Therefore, only water column profiling, water quality sampling, and intertidal surveys were conducted in 2018. R1 is at a shallower depth than the Exposure Area (the maximum depth is 15 m) and was not selected as a reference location for sediment quality and benthic infauna sampling.

Marine mammal observations were conducted in all study areas.

A list of sampling and measurements collected during the Reconnaissance Survey by stations is presented in Table 1.

Table 1: Surveys Conducted at Exposure and Reference Areas in 2018; 'X' indicates survey was conducted, '-' indicates survey was not conducted.

Surveys	Exposure Area	Reference Areas		
		A	B	R1
water column profiling	X	X	X	X
water quality sampling	X	X	X	X
sediment quality sampling	X	X	X	-
benthic invertebrates sampling	X	X	X	-
intertidal transect survey	X	X	X	X
marine mammal observations	X	X	X	X

[1] previously surveyed by Nunami Stantec (2012)

Table 2: Summary of survey stations and collected data

Station	Area	Coordinates (15 V)	Samples collected and replicates				
			Water column profiles (In situ)	Discrete water quality samples	Sediment quality samples	Benthic infauna samples	Intertidal transect surveys
WN	Exposure	546022 E 6963370 N	1	-	-	-	-
WC	Exposure	546002 E 6963295 N	1	-	-	-	-
WS	Exposure	545960 E 6963238 N	1	-	-	-	-
MWE-1	Exposure	546002 E 6963295 N	-	1 at 1 m; 1 at 18 m	-	-	-
MWE-2	Exposure	546021 E 6963373 N	-	1 at 1 m; 2a at 5 m	-	-	-
MBE-1	Exposure	545710 E 6963402 N	-	-	4b	3	-
MBE-2	Exposure	545894 E 6963340 N	-	-	3	3	-
MBE-3	Exposure	545991 E 6963294 N	-	-	3	3	-
MBE-4	Exposure	546123 E 6963268 N	-	-	3	3	-
MBE-5	Exposure	546304 E 6963213 N	-	-	3	3	-
MWRefA-1	Reference A	545070 E 6961511 N	1	1 at 1 m; 1 at 15 m	-	-	-
MWRefA-2	Reference A	545055 E 6961615 N	1	1 at 1 m; 1 at 15 m	-	-	-
MBRefA-1	Reference A	545070 E 6961511 N	-	-	3	3	-
MBRefA-2	Reference A	545028 E 6961609 N	-	-	3	3	-
MWRefA-3	Reference A	543992 E 6961780 N	1	1 at 1 m and 1 at 15 m	-	-	-

Table 2: Summary of survey stations and collected data

Station	Area	Coordinates (15 V)	Samples collected and replicates				
			Water column profiles (In situ)	Discrete water quality samples	Sediment quality samples	Benthic infauna samples	Intertidal transect surveys
MBRefA-3	Reference A	543984 E 6961768 N	-	-	3	3	-
CTD-1	Reference B	542232 E 6961875 N	1	-	-	-	-
CTD-2	Reference B	540426 E 6962686 N	1	-	-	-	-
CTD-3	Reference B	541626 E 6962080 N	1	-	-	-	-
MWRefB-1	Reference B	541626 E 6962080 N	-	1 at 1 m and 1 at 15 m	-	-	-
MBRefB-1	Reference B	541650 E 6962064 N	-	-	1	-	-
WW-1	Reference R1	545249 E 6963763 N	1	1 at 1 m and 1 at 10 m	-	-	-
WW-2	Reference R1	545249 E 6963857 N	1	-	-	-	-
Transect EXP-T1	Exposure	546085 E 6963605 N to 546131 E **6963519 N**	-	-	-	-	1
Transect EXP-T2	Exposure	546037 E 6963557 N to 546054 E 6963507 N	-	-	-	-	1
Transect REF-T1	Reference R1	545395 E 6963954 N to 545392 E 6963923 N	-	-	-	-	1
Transect REF-T2	Reference R1	545335 E 6963972 N to 545326 E 6963947 N	-	-	-	-	1
		Total	**11**	**15**	**26**	**24**	**4**

(a) includes blind water quality duplicate (Dup A)

(b) includes blind sediment quality duplicate (Dup A)

2.2.2 Water Quality

2.2.2.1 In situ Profiling

In situ parameters measured at each location included water depth, temperature, conductivity (salinity), dissolved oxygen, turbidity, chlorophyll concentration and transparency (Sechi depth). Vertical profiles were collected using an RBR XR-620 CTD (conductivity, temperature, depth) probe equipped with dissolved oxygen, turbidity and fluorometer sensors at stations in the Exposure and Reference areas (Figure 2 and Table 2). Measurements were taken throughout the water column by lowering the probe from the surface to the bottom at a vertical speed of approximately 0.5 m/sec while the probe was recording measurements at a frequency of 6 Hz (6 measurements per second).

Secchi depth was measured with a 30-cm white disk, which was lowered over the shaded side of the boat until no longer visible, raised back into view again and re-lowered. The second disappearance depth was recorded as the Secchi depth, from which photic zone depth can be calculated.

2.2.2.2 Discrete Water Quality Sampling

Discrete water quality samples were collected from stations in the Exposure and Reference areas shown on Figure 2 and in Table 2. Samples were collected at two depth intervals: 1 m below the surface, and at a depth approximately 5 m above the seafloor.

A water quality sampler (Kemmerer sampler) was lowered to target depth and a messenger was released along a tag line to trigger closure of the bottle sampler. After retrieval of the sampler, water samples were transferred to pre-labelled sample bottles and preservatives were added as required. Water samples were refrigerated until they were shipped to the analytical laboratory. Additionally, a blind duplicate sample was collected for quality assurance / quality control (QA/QC) purposes (refer to Section 2.3 for additional QA/QC details) at MWE-2D (deep sample).

Samples were sent to ALS analytical laboratories (ALS) for analysis of the following parameters:

- Conventional parameters, including pH, total dissolved solids (TDS), total suspended solids (TSS), hardness, electrical conductivity, and salinity.
- Major ions including sulphate and chloride.
- Nutrients, including ammonia, nitrate and phosphate, organic carbon.
- Total metals and dissolved metals including those listed in MDMER Schedule 4 and Schedule 5 paragraphs 4.

Water sampling effort was recorded in field log sheets presented in APPENDIX B.

2.2.3 Sediment Quality

Sediment quality samples were collected from stations in the Exposure Area and Reference areas A and B where water depth was approximately 20 m (Figure 2; Table 2). Three sediment samples were collected at each station.

Sediment samples were collected using a Petite Ponar grab sampler with an area of 0.0225 m^2 (Figure 4). Sediment samples were collected with three replicates from each station and each replicate sample consisted of approximately one to three grab samples, depending on grab penetration, to collect sufficient volume of substrate for analysis. Each grab sample was examined for acceptability based on the following criteria:

- sediment did not contain large foreign objects;

- grab showed adequate penetration depth and sufficient sediment volume (at least 25% full);
- grab was not overfilled (i.e., sediments did not touch the top of the grab);
- grab was not leaking (i.e., overlying water was present); and
- sample was not disturbed or winnowed (i.e., sediment surface was relatively flat).

Upon acceptance, the top 5 cm of sediment was removed from the grab using a clean stainless-steel spoon and transferred to a clean stainless-steel bowl. Sediments from all composite grabs were homogenized together until the colour and texture were consistent throughout the sample (Figure 5). Aliquots of the homogenized sediment were transferred to clean, labelled glass jars. Sediment samples were stored on ice packs in a cooler prior to shipment to the analytical laboratory.

Additional information, including the number of unsuccessful grabs, sediment appearance and odour (if any), presence of debris in sample, presence of live organisms in sample, and deviations from the planned sampling program, were recorded on field data sheets (APPENDIX C). The date, time, transect name, station number, and GPS coordinates of each sample were recorded. All sampling gear was rinsed and scrubbed with brushes with a biodegradable laboratory-grade detergent between sampling collections. Samples were kept in coolers in the field and in refrigeration until sent to ALS laboratories where they were analysed for the following parameters:

- particle size distribution (Wentworth scale);
- total organic carbon;
- nutrients; and
- total metal concentrations.

2.2.4 Benthic Infauna

Benthic infauna samples were collected from five stations in the Exposure Area and three stations in Reference Area A from a depth of 20 m. In general, benthic infauna samples were collected using the same device (Petite Ponar) and from the same locations as sediment quality samples with the exception of station MBRefB-1, where no benthic infauna samples were collected due to weather and safety constraints.

Benthic infauna samples were collected in triplicate from each station, with each replicate sample consisting of three to six grab samples, depending on grab penetration. Each benthic sample was examined for acceptability using criteria similar to that for sediment sampling.

Upon acceptance, contents of the grab sampler were transferred to an aluminum sieving tray (Figure 6). The contents were gently rinsed through a 1-mm mesh sieve with filtered seawater (Figure 7) and preserved in a 10% buffered formalin solution in pre-labeled 1 L wide-mouth HDPE sample jars. Larger organisms were removed during the rinsing process using forceps and preserved in separate jars to avoid crushing with hard substrate material. The containers were then sealed and inverted several times to promote homogenization with the formalin. Containers were labeled internally (water-resistant labels) and externally. Field observations (e.g., sediment characteristics) were recorded on field data sheets (APPENDIX D). Samples were sent to Biologica for species identification to the lowest practical taxonomic level and abundance determination.

2.2.5 Intertidal Habitat Surveys

Surveys in the intertidal zone were conducted along two transects in the Exposure Area and two transects in Reference Area R1 to characterize the epifloral and epifaunal communities and substrate type. Transect locations were selected with consideration for accessibility and safety for steep rocky shorelines and randomly within shallower sloped intertidal zones. Surveys were carried out on foot during low tide periods to maximize observations of the exposed intertidal zone.

Transect lines were positioned perpendicular to the shoreline starting from the ordinary high water (OHW) level and ending at the water line and start and end points were geo-referenced. A 0.25-m^2 quadrat (Figure 8) was positioned at 7 m intervals along each transect and the following key physical and biological information was collected for each quadrat:

- substrate types were identified on the surface using the size class categories, i.e., bedrock, boulder (>25 cm), cobble (6.5 to 25 cm), gravel, (0.2 to 6.5 cm) sand (0.06 to 0.2 mm) and silt/mud/clay (<0.06 mm), and recorded as percent cover (e.g., boulder 5%; cobble 15%; gravel 60%, sand 20%).
- presence and cover of macrophyte[4] epiflora (e.g., periphyton, filamentous algae, kelp) in each quadrat.
- presence and abundance of invertebrate epifauna in each quadrat (when present, bivalve siphon holes and/or crab burrows were also recorded, but not counted).
- other notable biophysical components such as presence of wood debris, shells or detrital vegetation.
- photographs taken showing representative features.

Notes on general and other features of the shoreline (e.g., shore type, wave exposure, presence of biobands and anthropogenic debris) were recorded at each transect. All observational data was recorded on Project-specific field data forms presented in APPENDIX E.

2.2.6 Marine Mammal Observations

Every hour marine areas around the boat were observed for a duration of up to 5 minutes for the presence of marine mammals. Observations were to be recorded on survey log sheets and included the following information:

- date and time of observation;
- location;
- species observed;
- number of animals observed;
- behaviour; and
- any other observations.

In addition, incidental marine mammal observations occurring during the fieldwork were recorded. Marine mammal observation data collected during the 2018 Reconnaissance Program would be used as a basis for recommendations for any potential 2019 marine mammal studies.

[4] Macrophyte – aquatic vegetation visible to the naked eye.

2.3 Quality Management

The overall goal of the Project was to collect quality data, which was achieved through consistent and thorough data collection, consultation amongst data recorders, and attention to detail during data entry.

Field staff was trained to be proficient in standardized sampling procedures, data recording using standardized forms, and equipment operations applicable to the monitoring program. All field work was completed according to specified instructions and established technical procedures for standard sample collection, preservation, handling, storage, and shipping protocols. Preliminary interpretation of the records and data QA/QC was carried out in the field to ensure the data collected met client specifications for quality and documentation of liability controls. At the end of the field survey, data was entered and organized in a database for subsequent analysis and interpretation. Field data recorded in notebooks was transferred to an electronic database.

A thorough QA/QC check of the data during the data analysis stage was conducted. The QA/QC measures set in place include a multi-tiered technical review team that review all data for consistency of methods and results and independently test random data samples for quality.

General QA/QC tasks completed during the survey include, but not limited to, the following:

- Preparing geo-referenced field maps for use during the surveys to accurately document the location of any observations.
- Preparing Project-specific data collection forms to ensure a comprehensive and accurate field data collection process.
- Collecting geo-referenced coordinates in the field for comparison with field maps to confirm the location of documented observations.
- Maintaining adequate photo documentation to illustrate the various features and species observed during field surveys, and to be kept for subsequent review and reporting.
- Collating and reviewing field data collected among observers to ensure consistent methods and calibrate observer estimates (e.g., estimation of substrate and vegetation cover in quadrat sampling).
- Reviewing all data and reports to review accuracy (e.g., species identification) and consistency (e.g., measurement units).
- Allowing regular communications between the Project Manager and field staff.
- Quality Control (duplicate) samples were collected in the field.
- Accredited laboratories will be selected for sample analysis. Performance quality of selected laboratories were verified through Golder's internal vendor approval and assessment procedures.
- Field data sheets were reviewed by the field supervisor at the end of each day for completeness and accuracy.
- Chain-of-custody documentation were used to track sample shipments to the individual subcontractor laboratories
- Samples were packaged and shipped to the laboratory in accordance with holding times and storage conditions in an effort for analyses to be met.

- Laboratory QA/QC for sediment samples included recommended sample holding times and the analysis of laboratory control samples, laboratory duplicates, and spiked samples to assess precision and accuracy of analytical methods. Laboratory QA/QC reports were reviewed upon receipt to confirm that the laboratory data quality objectives (DQOs) had been met and that the appropriate QA/QC information had been reported.

2.3.1 Water Quality

2.3.1.1 In Sutu Profiling

Maintenance and calibration of the RBR XR-620 CTD profiler and associated sensors are performed by the instrument provider ASL Environmental (completed immediately prior to the reconnaissance program). No field quality checks of any of the parameters were required beyond the cast acceptability check and range checks. DO, pH, pressure offset, and transmissivity performance were carefully monitored and calibrated prior to and immediately following the reconnaissance program.

Immediately following data collection, all data were checked for erroneous values, outliers and to be certain that all data and configuration files were present and properly named. All data were reviewed graphically for outliers as well as trends, and to confirm that all sensors were functioning properly during the deployment. All profile data, datasheets and field notes were saved to a laptop computer and backed up on an external hard drive.

2.3.1.2 Discrete Water Quality Sampling

QA/QC measures were implemented to minimize possible contamination of the collected water samples. Industry standard sampling protocols were followed including collection, handling and shipping procedures. Samples were collected in laboratory-sterilized water bottles and included collection and analysis of a duplicate sample.

A blind duplicate water sample was taken from MWE-2D (Dup A). A number of duplicate analyses were also run by the ALS laboratory for QA/QC. For each pair of QA/QC duplicate water samples, the relative percent differences (RPD) can be calculated, using the following formula:

$$RPD = \left(\frac{sample - duplicate}{(sample + duplicate)/2}\right) \times 100$$

The RPD between the duplicates is a measure of the variability inherent in field sampling (environmental heterogeneity, sampler handling leading to contamination). It is suggested that any field duplicates with RPD values exceeding 20% should be noted and the data should be interpreted accordingly (BCMOE 2013). Where concentrations are within five times the method detection limit (MDL), no RPD calculation is required as long as the difference between replicates is within a value equal to two times the MDL. This is due to the RPD being more sensitive to variation as values approach the analytical detection limit.

2.3.2 Sediment Quality

To confirm sediment sample integrity, the following QA/QC measures were undertaken:

- Samples were collected and processed by qualified experienced personnel.
- Samples were collected in such a way that no foreign material was introduced to the sample.
- Sample handling or contact with contaminated materials/surfaces was minimized.
- Samples were placed in appropriate clean containers in such a way that no material of interest was lost due to adsorption, degradation, or volatilization.

- Sufficient sediment volumes were collected so that required detection limits can be met, and quality control samples can be analyzed.
- Equipment including the grab sampler, stainless steel bowls and spoons were washed with laboratory-grade biodegradable detergent between each station to prevent cross-contamination. Equipment was rinsed between grab samples.
- A duplicate sample (Dup A) was collected from MBE-1 Replicate 3 (APPENDIX C). The duplicate was a discrete homogenized sample from a separately collected grab (as opposed to a split sample). In accordance with the BC Field Sampling Manual (BC MOE 2013), an RPD value of ±50% can be used to identify differences between original and duplicate samples. Values less than five times the MDL should not be included in the RPD calculations because analytical variability near the MDL is higher and does not provide a good measure of variability associated with the collection of field samples.

2.3.3 Benthic Infauna

Field QA/QC procedures are discussed in Section 2.2.4. Biologica laboratory QA/QC measures included an assessment of sorting recovery, identification error, and precision/accuracy of sub-sampling. The taxonomic laboratory identified organisms to the lowest practical taxonomic level. Laboratory procedures included sample sorting measures, spot-checks, preliminary counting of major groups, and collaborative identification to accurately identify species to their lowest taxonomic level. Results of QA/QC measures implemented by the taxonomic laboratory are reported in APPENDIX H.

Benthic data was checked and no obvious signs of error in sample analysis were found. Incidental organisms, including meiofauna and zooplankton species, were removed from benthic analysis.

2.3.4 Intertidal Habitat Surveys

The following measures were undertaken to achieve the QA/QC objectives of the surveys:

- assessment was conducted by qualified and competent personnel;
- photo documentation of each transect line and quadrat was collected and maintained;
- species identification and quantitative assessment was verified by two field personnel;
- geo-referenced location coordinates collected in the field were plotted on electronic maps (e.g., Google earth) to confirm the location of documented observations; and
- field data sheets were reviewed by the project supervisor to confirm completeness and accuracy.

3.0 RESULTS

3.1 Study Areas

Reference areas A and B were determined suitable for future monitoring reference sites for the Exposure Area since both have similar bathymetric (within 20-m) and topographic profiles, easily accessible by boat and at a relatively short distance from Rankin Inlet, and located outside of the potential zone of influence from the discharge and other anthropogenic factors. These features make Reference areas A and B more suitable than Reference areas C and D, which are located in areas less safely accessible.

3.2 Water Quality

3.2.1 In Situ Profiling

Vertical profiles of the water column measured during the surveys are presented in Figure 9 to Figure 15. Graphs were smoothed by using running averages.

Oceanographic conditions measured during the survey were similar among the study areas. Physical properties of water were uniform throughout the entire column and displayed a well mixed pelagic environment with no vertical stratification indicating strong oceanic influence with no or little freshwater influence. Water temperature was slightly lower at the bottom and higher at the surface at some locations, however, horizontal variations in water temperature between different sites were, in general, greater than vertical differences at each station. Water temperature ranged from 5.1 to 6.2°C. Salinity was uniform throughout the water column and ranged between 30.7 and 30.9 PSU for all survey areas and depths. An exception was a cast at station CTD-1 where salinity was slightly lower (30.5 PSU) at the surface (top 10 cm).

Water was, in general, clear throughout all study areas. Turbidity was slightly higher in Melvin Bay (Exposure Area and Reference Area R1) than in Reference areas A and B and ranged between 1.2 and 2.4 NTU. An exception was the CTD-1 (Reference Area B) cast where turbidity at the surface was 6.1 NTU, which may have been caused by wind-generated dust deposition at the moment of measurement.

Chlorophyll concentrations ranged from 0.4 to 1.5 µg/L corresponding to typical for Arctic waters oligotrophic (nutrient poor) to mesotrophic (with moderate level of nutrients) marine systems (CCME 2007 adopted from Vollenweider et al 1998). Chlorophyll maximums occurred at depths below 5 to 10 m. Dissolved oxygen concentrations were also vertically uniform at all survey locations and ranged from 6.5 ml/L to 8 ml/L.

3.2.2 Discrete Water Samples

Analytical results of discrete water quality samples are presented in APPENDIX F and APPENDIX G. Recommended hold times were exceeded for several components, i.e., TDS, TSS, pH, dissolved orthophosphate, nitrate, nitrite and total phosphorus, due to delivery delays caused by the remote location.

Results of the QA/QC assessment procedures conducted by the laboratory are also presented in APPENDIX F and APPENDIX G. RPDs were calculated between sample MWE-2D and its blind field duplicate (DUP A), and no RPD value was found exceeding 20% (APPENDIX F-2).

Laboratory derived results for salinity were similar to those measured in situ, albeit having a slightly wider range (29.7 – 31.3 PSU). Concentrations of TSS were low ranging from below the detection limit of 2 mg/L to 3.8 mg/L. Water quality results were screened against the Canadian Council of Ministers of Environment (CCME) guidelines for the protection of aquatic life for marine environments (CCME 2014). None of the parameters exceeded CCME guidelines.

3.3 Sediment Quality

Field observations recorded in sediment sampling logs (APPENDIX C) show that benthic substrate was similar throughout the surveyed areas and predominantly consisted of silt and clay. The only exception was station MBRefB1 (Reference Area B) where sediment consisted of a coarser substrate, mixture of sand, gravel and silt.

Analytical results of sediment quality samples including the internal QA/QC assessment procedures conducted by the laboratory are presented in APPENDIX G. RPDs were calculated between sample MBE-1 Replicate 3 and its blind duplicate (DUP A) (APPENDIX G-2). RPDs for molybdenum and nickel exceeded 50% and were 111% and 54%, respectively. Differences in metal concentrations between the two samples can be attributed to spatial variability in sediment composition in the study area, since these samples were collected from two different grabs.

Analysis showed that sediment at stations, except MBRefB1, consisted predominantly of fine particles (silt) and was classified as silty loam or silt. Sediment at MBRefB1 had a higher percentage of sand and was classified as sandy loam. A preliminary screening against CCME guidelines showed that concentration of chromium in one sample (MBE-1 replicate 3 [57 mg/kg]) exceeded the Interim Sediment Quality Guideline (ISQG) for the protection of aquatic life in the marine environment for chromium of 52 mg/kg (CCME 2014). Concentrations of all other analyzed parameters were below sediment quality guidelines.

3.4 Benthic Infauna

Information on the analysis of benthic infauna samples, including taxonomic and abundance data, laboratory analytical methods, and QA/QC results are presented in APPENDIX H. A total of 24 samples (eight stations with three samples collected at each) were analysed. A total of 1,400 benthic infauna (benthos) organisms were observed, representing 52 unique taxa (species or genus level). Unique taxa for 83 organisms could not be determined and were identified to a higher taxonomic level (genus or family). Incidental organisms, including meiofauna (e.g. nematodes), plankton (Brachyura larvae) and fragments of indeterminate species, removed from benthos were reported separately; a total of 13 incidental organisms were found in benthic infauna samples.

Abundance per sample ranged from 15 organisms (MBE-1-3) to 120 organisms (MBE-5-2); the average abundance ranged from 36 (MBE Ref A-1) to 97 organisms (MBE-5) per station. Taxonomic richness (number of taxa per sample) ranged from 8 (MBE Ref A-1-3) to 19 (MBE Ref A-3-2); the average taxonomic richness ranged from 10 (MBE Ref A-1) to 17 taxa (MBE Ref A-3) per station (APPENDIX H).

Benthic communities in the study areas were dominated by polychaete worms, which represented 63% of all organisms and 40% of identified unique taxa. Crustaceans were the second largest group of benthic invertebrates representing 31% of all organisms and 29% of identified unique taxa. The single most abundant taxon (338 organisms) across all stations was amphipod crustacean *Protomedeia sp*., which constituted 24% of all organisms. Taxonomic composition of benthic infauna communities between the Exposure and Reference A Areas was, in general, similar with few notable exceptions. Polychaete worm (*Ophelina acuminata*) was found in high abundance (40 organisms) in samples from the Reference A area but was not found in any samples from the Exposure Area. Smooth nutclam (*Ennucula tenuis*) and amphipod (*Bathymedon obtusifrons*) were found in relatively high abundance (17 and 10 organisms, respectively) in several samples from the Exposure Area, but none were found in the Reference Area A.

All samples were analysed in whole due to relatively low volumes of sediments and debris in sample containers (APPENDIX H). All analysed samples were re-sorted for QA/QC purposes to assess sorting efficiency; 100% sorting efficiency was achieved for all analysed samples (APPENDIX H).

All benthic infauna specimens were archived in air-tight glass vials with glycerin and 70% ethanol for long-term storage.

3.5 Intertidal Habitat

Data collected during the intertidal habitat surveys is presented in the form of field-filled data sheets in APPENDIX E. The intertidal zone in the Exposure Area was characterized as a gently-sloped flat topography (Figure 16). The length of intertidal transect EXP-T1 in the Exposure Area was approximately 100 m. The substrate was predominantly hard and composed of boulders, coble and gravel, intermittent, at places, with sandy patches in the lower areas. Epiflora and epifauna were sparse, particularly in the upper and middle parts of the intertidal zone. Epiflora was more abundant in the lower intertidal zone in the Exposure Area where approximately 30-m-wide band of vegetation (up to 55% cover) was observed represented mainly by rockweed (*Fucus* sp.; Figure 17). Epifauna was mostly represented by molluscs, such as snails *Littorina spp.* and mussels.

The intertidal zone in Reference Area R1 had a steeper slope than the Exposure Area, particularly in the upper areas (Figure 18). The length of intertidal transects in Reference Area R1 ranged between 27 and 31 m. The substrate in this area was similar to that of the Exposure Area, however, abundance and diversity of epiflora and epifauna were considerably lower in Reference Area R1.

3.6 Marine Mammals

No marine mammals were observed during the surveys at any of the surveyed sites.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Reference areas A, B and R1 had similar oceanographic conditions as the Exposure Area. Reference areas A and B have the same depth contours as the Exposure Area, but Reference Area R1 is located at a shallower water depth than the Exposure Area and was not selected as a reference area for sediment and benthic infauna monitoring. Reference Area A had similar substrate types as the Exposure Area, while Reference Area B had a slightly coarser substrate. Although a limited number of sediment samples (1 sample only) and no benthic infauna samples were collected at Reference Area B due to weather issues, there is a potential to still use this site as a future reference area.

Based on the 2018 Marine Reconnaissance Surveys and the requirements for EEM, the following are recommended to improve future surveys:

- Conduct Baseline Study Program during the summer of 2019 prior to treated groundwater effluent discharge as outlined in Golder's Proposal No P18103567. The studies will consist of complete baseline data collection for water and sediment quality, benthic invertebrates, fish population and fish tissue studies per EEM study requirements under MDMER. Sampling at reference areas (A and B) be conducted in concurrence with sampling at the Exposure Area for the environmental effects monitoring purposes.
- Commence field surveys earlier in the season, July or August of 2019, at a period with reduced wind conditions in the marine environment. This will allow for safer marine vessel operations and sampling activities and potentially fewer delays due to unfavourable weather.

Signature Page

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Original signed by:

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AO/DN/LY/rd

5.0 REFERENCES

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APPENDIX A

Figures and Photos

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6960000
6955000

POTENTIAL REFERENCE AREA C

RANKIN INLET

POTENTIAL REFERENCE AREA D

REFERENCE AREA R1

EXPOSURE AREA

REFERENCE AREA B

REFERENCE AREA A

HUDSON BAY

LEGEND

- STUDY AREA
- MINE FOOTPRINT
- WATERSHED BOUNDARY
- WATERCOURSE
- WATERBODY

0 1.5 3

1:75,000 KILOMETRES

REFERENCE(S)

1. BASE DATA OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. DATUM: NAD83 PROJECTION UTM ZONE 15

CLIENT

AGNICO EAGLE MINES LIMITED

AGNICO EAGLE

PROJECT

MELIADINE GOLD MINE
OCEAN DISCHARGE MONITORING PLAN – MARINE RECONNAISSANCE AND BASELINE PROGRAMS

TITLE

RECONNAISSANCE STUDY AREA OVERVIEW MAP

CONSULTANT

GOLDER

YYYY-MM-DD	2019-02-22
DESIGNED	AO
PREPARED	CN
REVIEWED	AO
APPROVED	MT

PROJECT NO.	CONTROL	REV.	FIGURE
18103567	5000/5001	0	1

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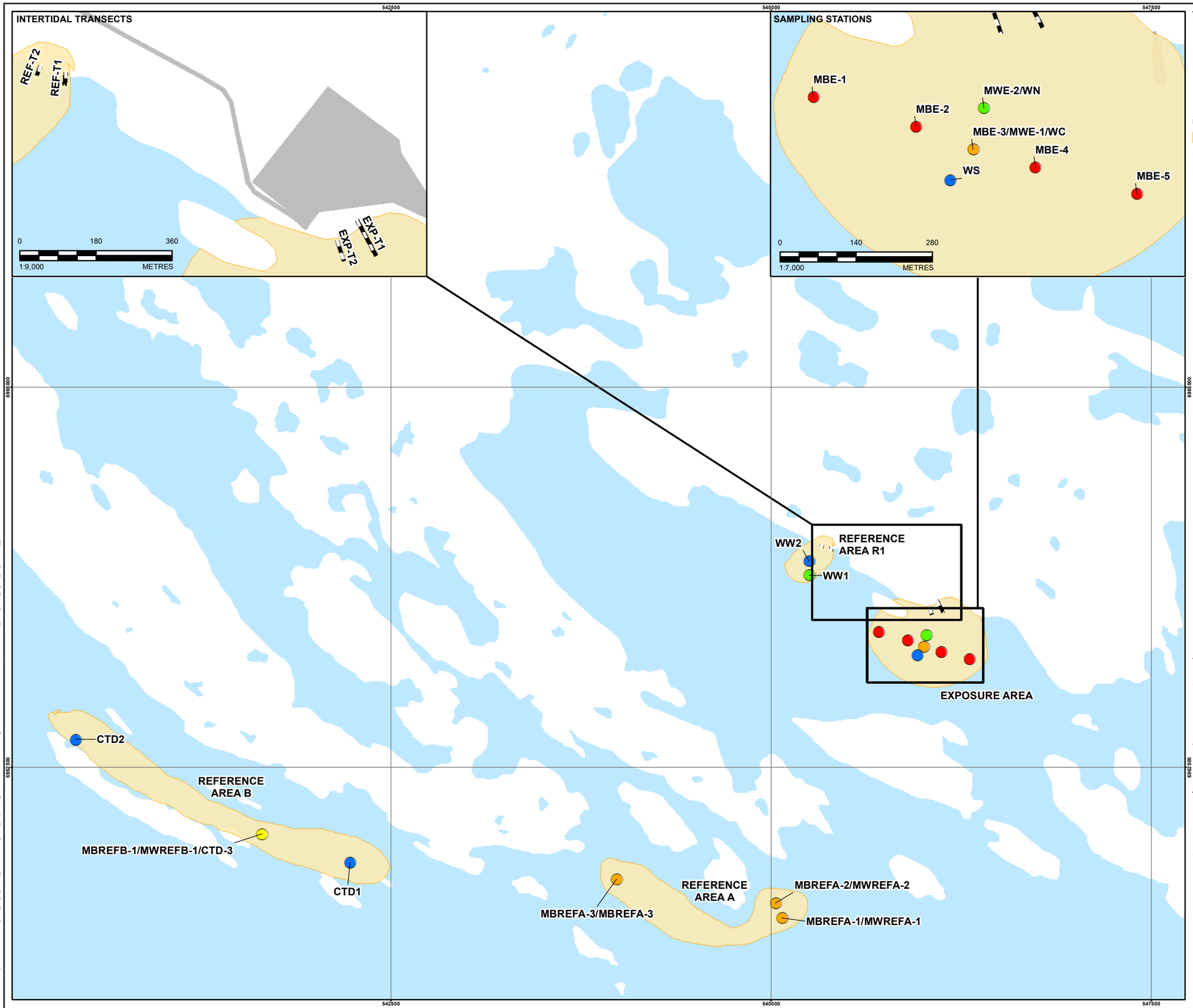

LEGEND

- SEDIMENT, BENTHIC INFAUNA
- CTD, WATER QUALITY, SEDIMENT, BENTHIC INFAUNA
- CTD, WATER QUALITY, SEDIMENT CHEMISTRY
- CTD, WATER QUALITY
- CTD
- TRANSECT
- STUDY AREA
- WATERCOURSE
- WATERBODY

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REFERENCE(S)
1. BASE DATA OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. DATUM: NAD83 PROJECTION UTM ZONE 15

CLIENT
AGNICO EAGLE MINES LIMITED
AGNICO EAGLE

PROJECT
MELIADINE GOLD MINE
OCEAN DISCHARGE MONITORING PLAN – MARINE RECONNAISSANCE AND BASELINE PROGRAMS

TITLE
SAMPLING STATIONS

CONSULTANT
GOLDER

YYYY-MM-DD	2019-02-22
DESIGNED	AO
PREPARED	CN
REVIEWED	AO
APPROVED	MT

PROJECT NO.	CONTROL	REV.	FIGURE
18103567	5000/5001	0	2

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25mm
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Figure 3: Survey boat at the Exposure Area.

Figure 4: Sediment sampling using Petite Ponar grab

Figure 5: Homogenized sediment sample

Figure 6: Benthic infauna 1-mm sieving tray

Figure 7: Washed benthic infauna sample

Figure 8: Intertidal survey quadrat (0.5 m x 0.5 m)

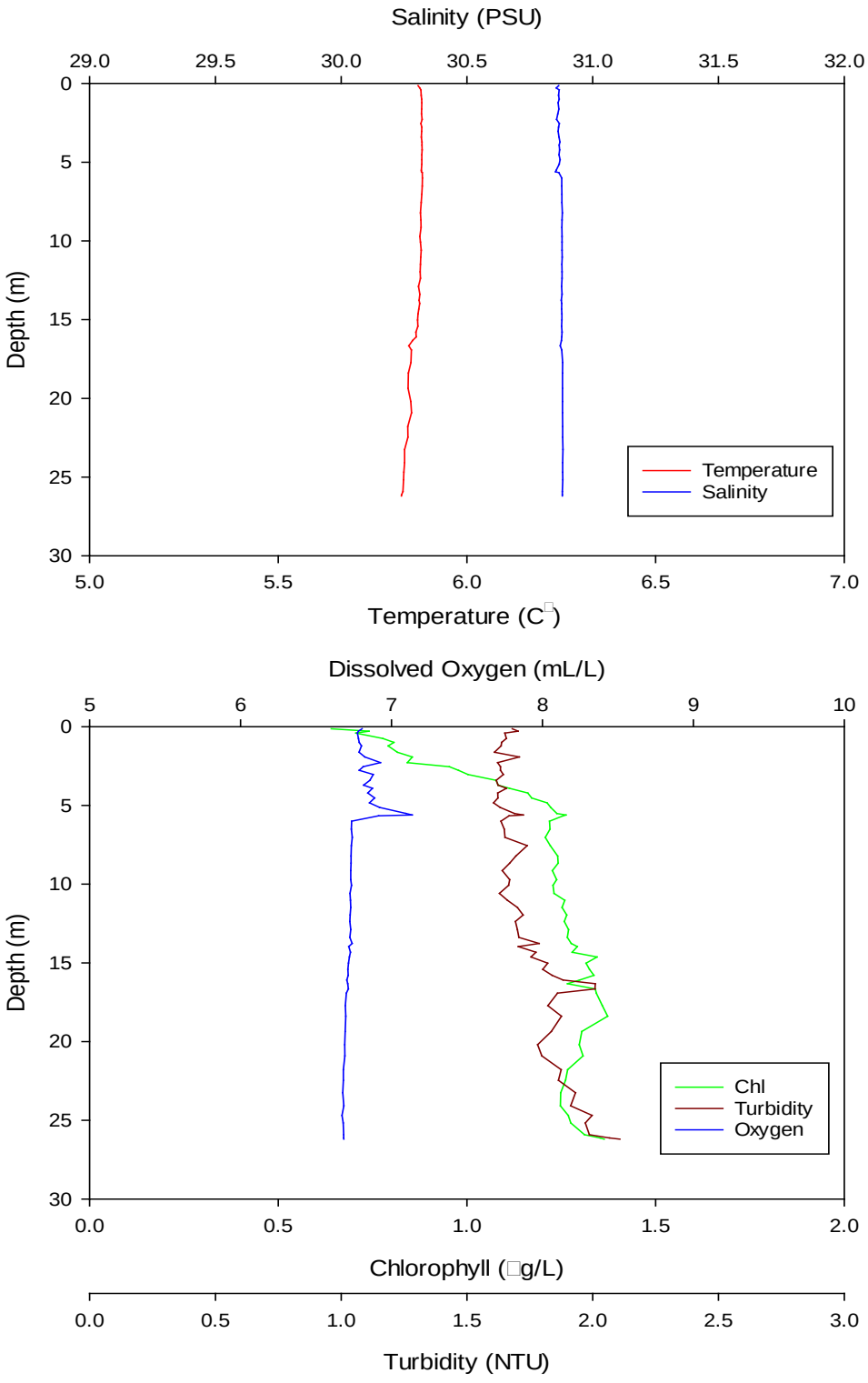

Figure 9: Exposure Area vertical water column profiles: temperature and salinity (top), and turbidity, chlorophyll and oxygen concentrations (bottom)

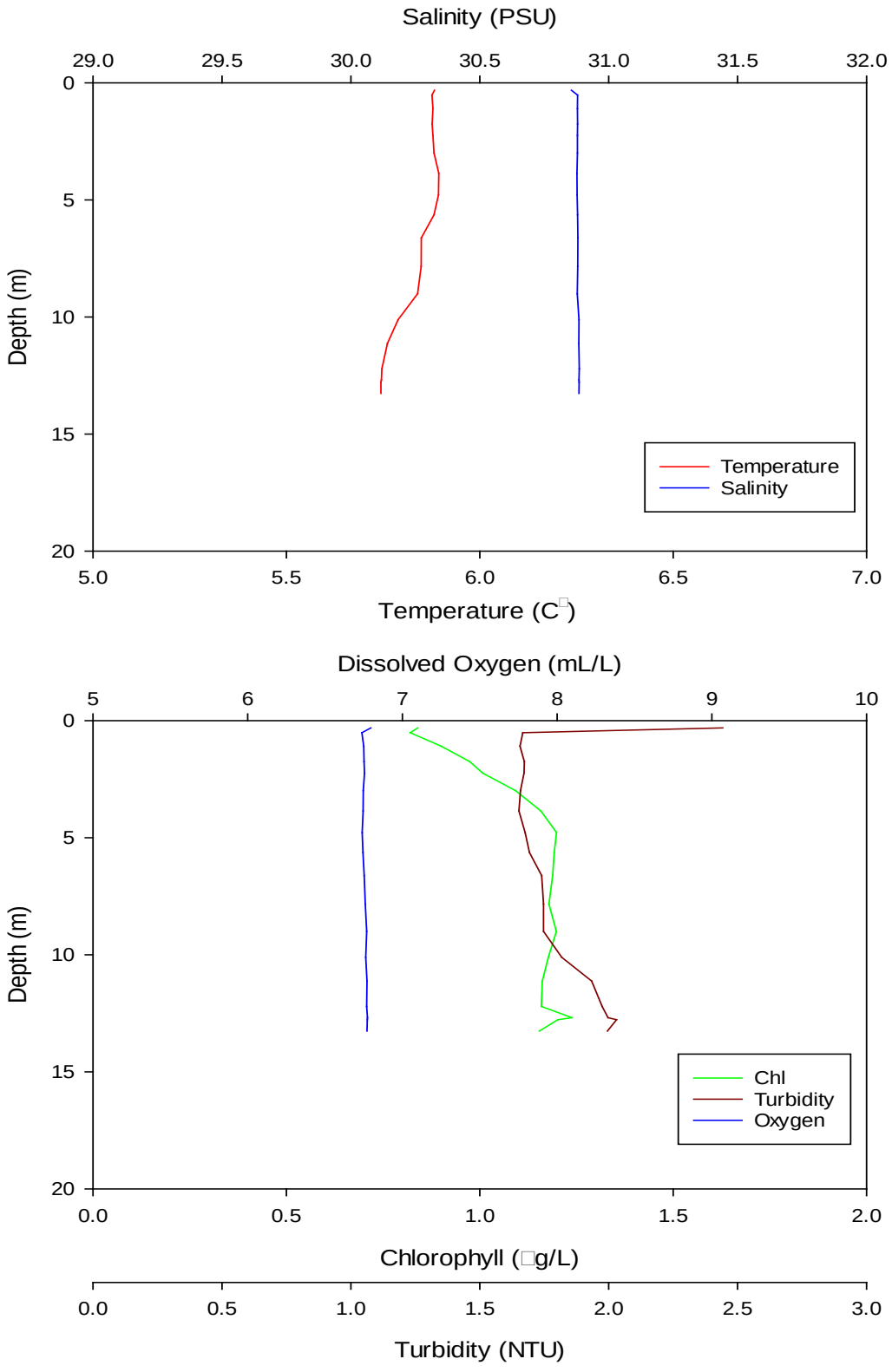

Figure 10: Reference Area R1 vertical water column profiles: temperature and salinity (top), and turbidity, chlorophyll and oxygen concentrations (bottom)

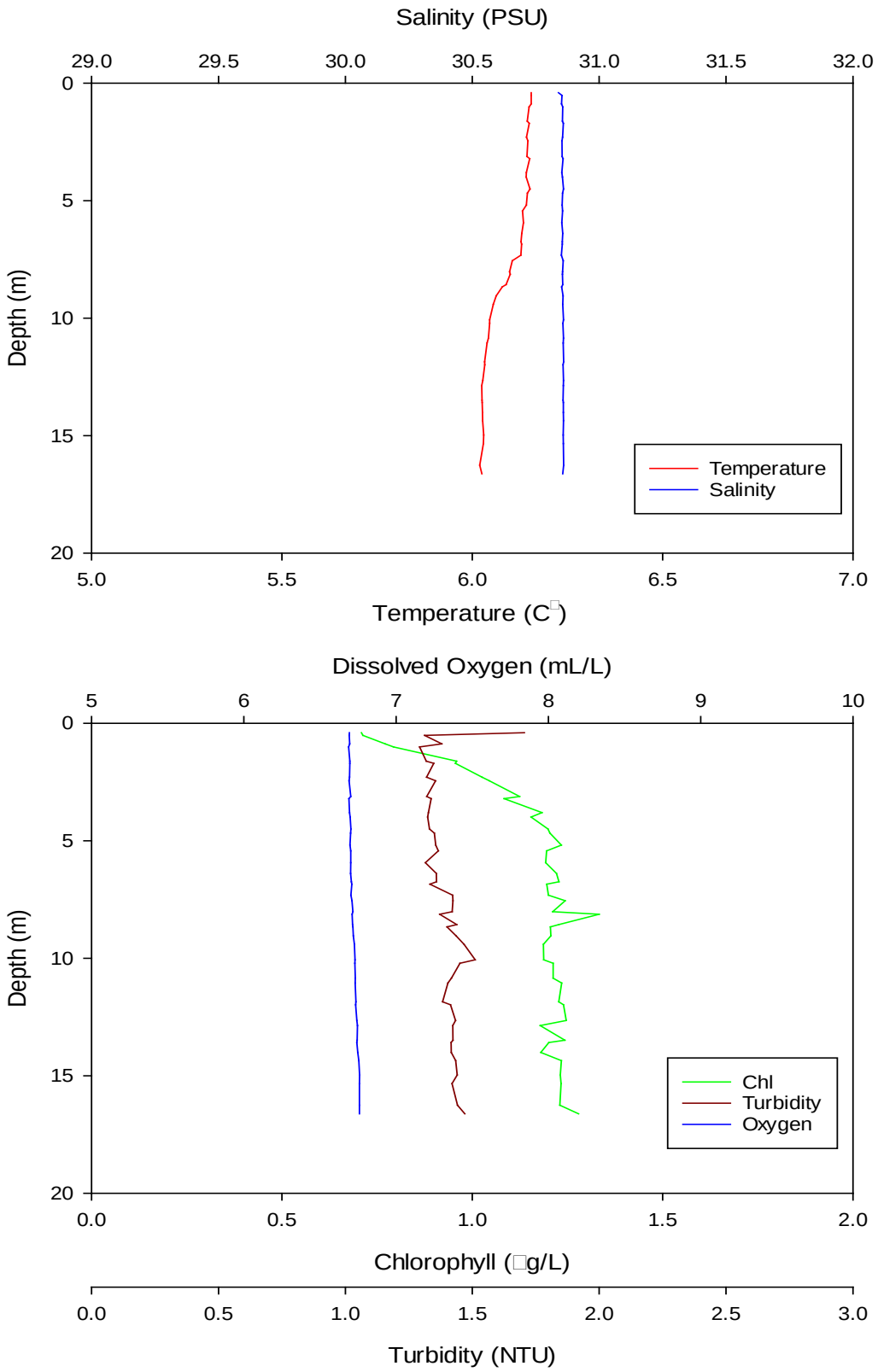

Figure 11: NWRefA-2 (Reference Area A) vertical water column profiles: temperature and salinity (top), and turbidity, chlorophyll and oxygen concentrations (bottom)

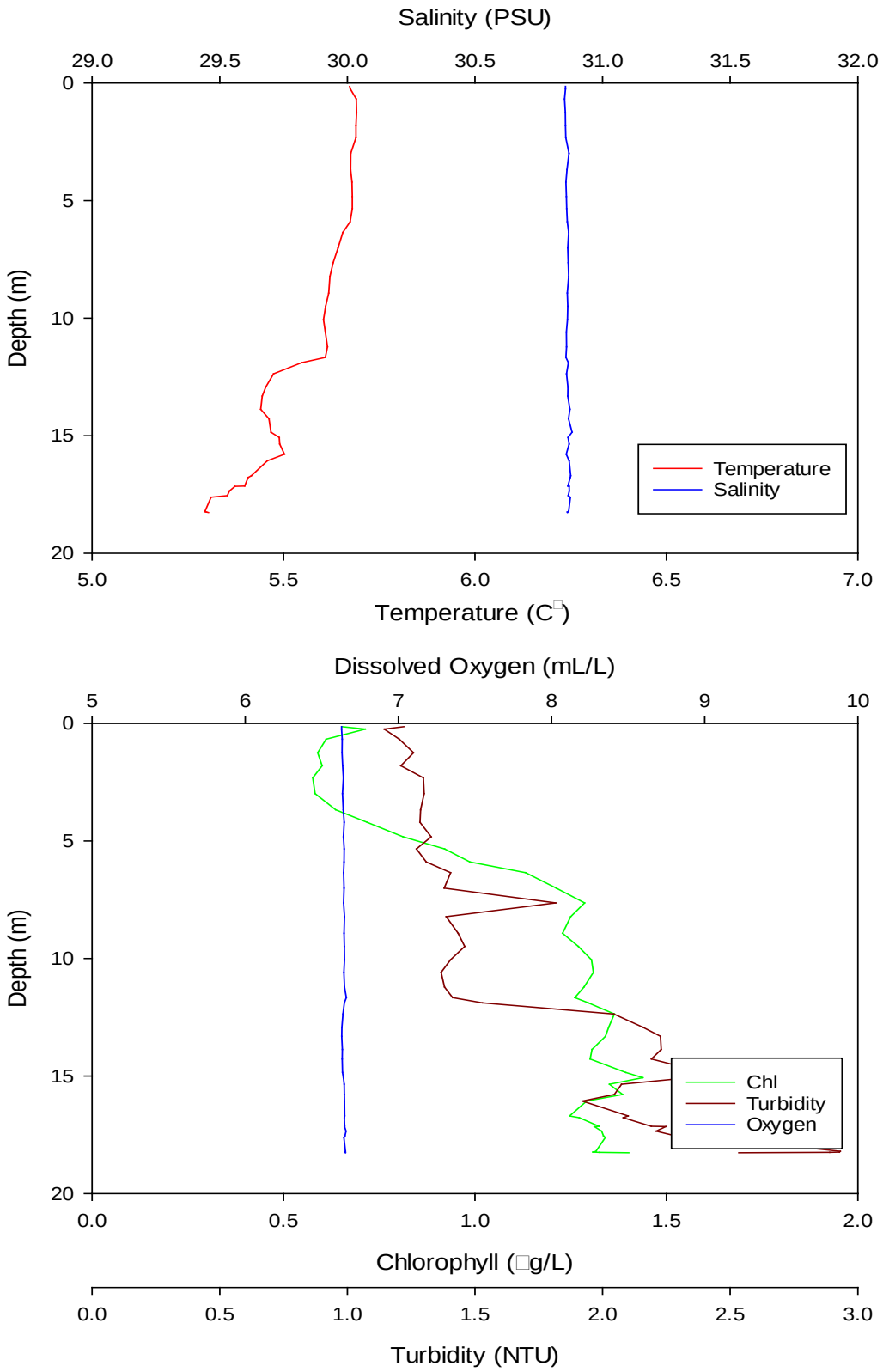

Figure 12: NWRefA-3 (Reference Area A) vertical water column profiles: temperature and salinity (top), and turbidity, chlorophyll and oxygen concentrations (bottom)

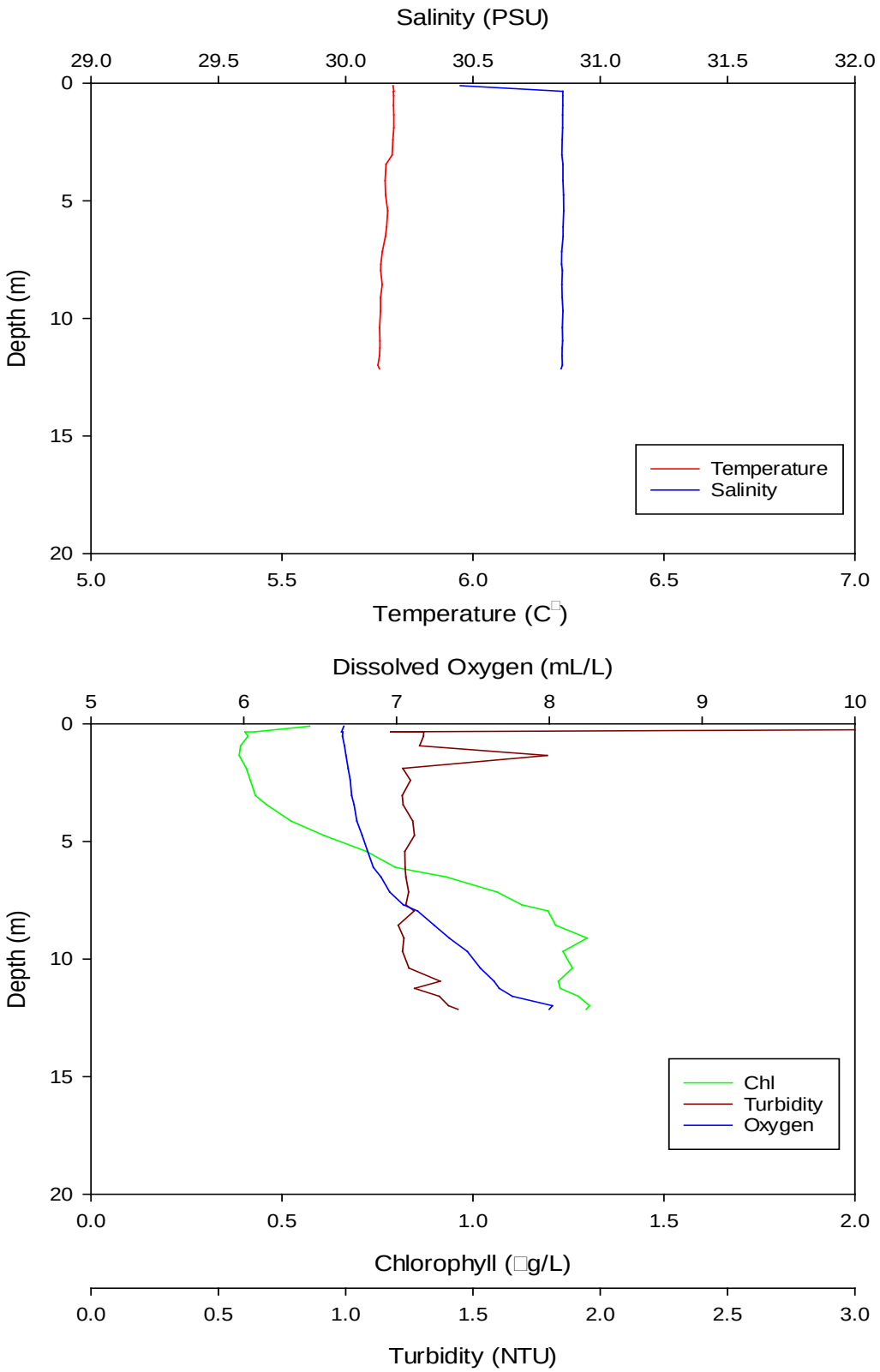

Figure 13: CTD-1 (Reference Area B) vertical water column profiles: temperature and salinity (top), and turbidity, chlorophyll and oxygen concentrations (bottom)

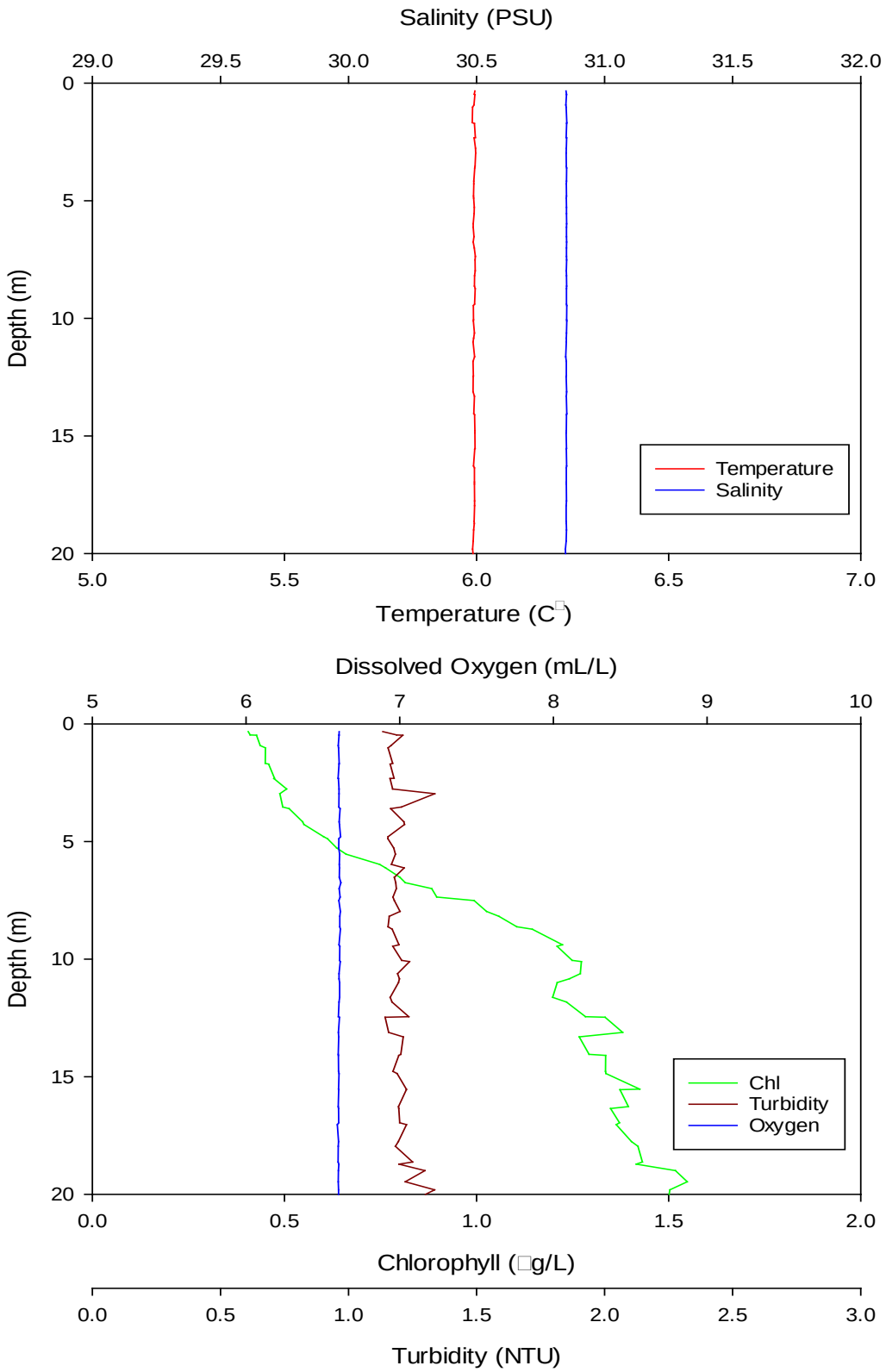

Figure 14: CTD-2 (Reference Area B) vertical water column profiles: temperature and salinity (top), and turbidity, chlorophyll and oxygen concentrations (bottom)

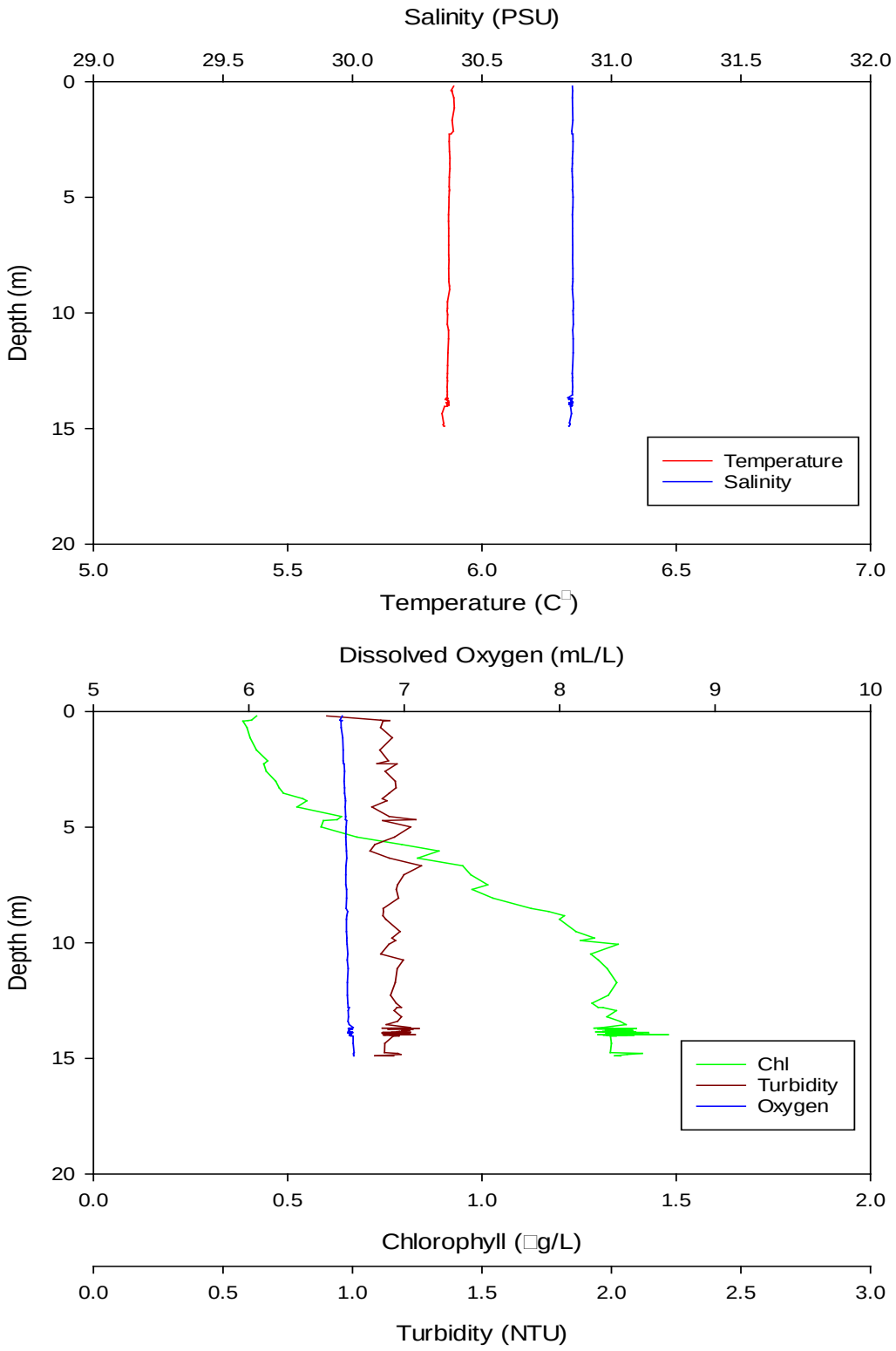

Figure 15: CTD-3 (Reference Area B) vertical water column profiles: temperature and salinity (top), and turbidity, chlorophyll and oxygen concentrations (bottom)

Figure 16: Intertidal Transect EXP-T1 (Exposure Area), September 14, 2018

Figure 17: An epifloral band in the lower intertidal zone in the Exposure Area represented mostly by rockweed (*Fucus* sp.), September 14, 2018

Figure 18: Intertidal transect REF-T1 in the Reference Area R1, September 15, 2018

APPENDIX B

Water Quality Sampling Field Logs

18103562

Meliadine Marine Recon

CTD and Water Quality Sampling **Project #:** **Project title:** 2018

Station name: WW1 **# of Casts/Bottles:** 1/7 **Date:** Sep 17 **Sampled By:** AR & SG

Coordinates: **Easting:** 0545241 **Northing:** 6963763 **Time:** 18^15 **Water Depth (m):** 15

Weather: rainy & snowy **Wind Spd/Dir:** 20 SW **Tide:** low @ 1745

Sample Name	Sample Depth (m)	Duplicate Name	# of Bottles Filled	Comments
WW1S	1	/	7	5.4. 5.2 ~5.3 Secchi
WW1D	10	/	7	

Station name: MWE-1 **# of Casts/Bottles:** 1 **Date:** Sep 17 **Sampled By:** AR SG

Coordinates: **Easting:** 15U 0546002 **Northing:** 6963295 **Time:** 18:46 **Depth (m):** 24

Weather: cloudy, light rain **Wind Spd/Dir:** 15 S kt **Tide:** rising

Sample Name	Sample Depth (m)	Duplicate Name	# of Bottles Filled	Comments
MWE-1D	16	/	7	Secchi: 5.4 & 5.2 ~5.3m
MWE-1S	1	/	7	

Station name: **# of Casts/Bottles:** **Date:** **Sampled By:**

Coordinates: **Easting:** **Northing:** **Time:** **Depth (m):**

Weather: **Wind Spd/Dir:** **Tide:**

Sample Name	Sample Depth (m)	Duplicate Name	All Bottles Checked (Y/N)?	Comments

1B|03567 / Meliadine Marine Reason

CTD and Water Quality Sampling **Project #:** **Project title:** 2018

Station name: MW Reg A 3 **# of Casts/Bottles:** 1/7 **Date:** Sept 20 **Sampled By:** AR SK

Coordinates: **Easting:** 15V 0543992 **Northing:** 6961780 **Time:** 0930 **Water Depth (m):** 21

Weather: sun + cloud **Wind Spd/Dir:** SSW 15kt **Tide:** low slack

Sample Name	Sample Depth (m)	Duplicate Name	# of Bottles Filled	Comments
MWReg A 3.S	1	N/A	7	CTD
MWReg A 3.D	15	N/A	7	

Station name: MW Reg B1 **# of Casts/Bottles:** 1/7 **Date:** Sept 20 **Sampled By:** AR

Coordinates: **Easting:** 15V 0541626 **Northing:** 6962080 **Time:** 1120 **Depth (m):** 56 ~~19m~~

Weather: cloudy 1°C **Wind Spd/Dir:** 15kt south **Tide:** flood

Sample Name	Sample Depth (m)	Duplicate Name	# of Bottles Filled	Comments
MWReg B1S	1	/	7	secchi = lost = 5.7 resight = 5.5 actual = 5.6m
B1D	15	/	7	wavelets make sighting difficult

Station name: **# of Casts/Bottles:** **Date:** **Sampled By:**

Coordinates: **Easting:** **Northing:** **Time:** **Depth (m):**

Weather: **Wind Spd/Dir:** **Tide:**

Sample Name	Sample Depth (m)	Duplicate Name	All Bottles Checked (Y/N)?	Comments

18103567

Meliadine Marine Recon

CTD and Water Quality Sampling

Project #: [redacted]

Project title: 2018 [redacted]

Station name: MWE-2 | **# of Casts/Bottles:** 1 cast / 7 | **Date:** Sept 17 2018 | **Sampled By:** AR & JG

Coordinates: Easting: 15V 0546021 WP 127 | **Northing:** 6963373 | **Time:** 16:30 | **Water Depth (m):** 8.6 m

Weather: cloudy | **Wind Spd/Dir:** W 20 kt | **Tide:** low @ 17:40

Sample Name	Sample Depth (m)	Duplicate Name	# of Bottles Filled	Comments
MWE-2	1m	N/A	7	secchi lost 4.5 re-sight 4.2 actual 4.35
MWE-2D	5m	DUP A	7	

Station name: MB Reg A-1 | **# of Casts/Bottles:** 1 / 7 | **Date:** Sept 17 | **Sampled By:** AR JG

Coordinates: Easting: same as MB Reg A | **Northing:** | **Time:** 17[10] | **Depth (m):** 20

Weather: cloudy | **Wind Spd/Dir:** SW 20 kt | **Tide:** low slack

Sample Name	Sample Depth (m)	Duplicate Name	# of Bottles Filled	Comments
MB Reg A-1S	1m	✓	7	secchi lost 5.8 re-sight 5.6 actual (5.7)
" 1D	15m	✓	7	

Station name: MW Reg A-2 | **# of Casts/Bottles:** 7 | **Date:** Sept 17 | **Sampled By:** AR

Coordinates: Easting: 15V 0545055 | **Northing:** 6961615 | **Time:** 17[45] | **Depth (m):** 21

Weather: cloudy 2°C | **Wind Spd/Dir:** SW 20 kt | **Tide:** low slack

Sample Name	Sample Depth (m)	Duplicate Name	All Bottles Checked (Y/N)?	Comments
MW Reg A-2S	1	✓	Y	secchi 5.4 5.2 = 5.3
" 2D	16	✓	Y	difficult w/ chop & waves

APPENDIX C

Sediment Sampling Field Logs

Chemistry

SEDIMENT SAMPLING LOG - GRAB

Project No: 18103567 · 4000

Project Title: Meliadine - diffuser

Date: Sept 13 2018

Sampled by: AR, SG

Station Number (ID): MBE-1 Rep3

Sampling Method: P. ponar

Weather: sunny ; wind E 5kt

Lat/Longitude: 15 V 0545710 6963402

Sampling Depth: 22m

# of Attempts to Obtain Sample: see below

Time of Collection: 17:15

Sediment Description

Grain Size (boulder, cobble, gravel, sand, silt, clay; trace, some, -y, and); **Inclusions** (shells, organisms, other non-soil components) **Consistency/Compactness** (v loose, loose, compact, dense, v dense; vsoft, soft, firm, stiff, v stiff, hard); **Moisture Content** (dry, moist, wet, saturated); **Colour; Structure; Contaminants** (staining/odour/sheen); **Other** (wood, debris, organisms).

- silt & clay ; thin light brown veneer (unconsolidated) over dense, stiff
- soft veneer
- worms, clam -no odour, sheen, or stain
- v. small trace organics (dark brown)

Approx % collected in grab sample Rep 1 25% + 15%, Rep2 - 25+25, Rep 3 40-50%

Photograph Reference Number(s): AR phone

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

- polychaetes (lg + small)
- lg clam (Sp = Mya (?)) > most fauna out of MBE's

Sample Control Number (SCN):

Analysis for:

- ☐ Full Metals
- ☐ Grain Size
- ☐ TOC
- ☐ Other
- ☐ PAH
- ☐ Total PCBs
- ☐ Toxicity
- ☐ PAH Fingerprinting
- ☐ AVS SEM
- ☐ LEPH/HEPH

Other Notes: # of Grabs for Analysis:

Rep 1 : 2 grab ; 5 attempts 1 lg clam (~18 yrs old)

2 : 2 " ; 4 attempts

3 : 4 grabs ; 5 attempts Rep 3 = DUP (A)

Reviewed By: AR

Chemistry

SEDIMENT SAMPLING LOG - GRAB

Project No: 18103567 · 4000

Project Title: Meliadine diffuser

Date: Sept 13 2018

Sampled by: AR, JG

Station Number (ID): MBE-2 Reps

Sampling Method: Petit Ponar

Weather: sunny; wind S 5kt

Lat/Longitude: 15 V 0545894 6963340

Sampling Depth: 21 m

# of Attempts to Obtain Sample: see below

Time of Collection: 16:05

Sediment Description

Grain Size (boulder, cobble, gravel, sand, silt, clay; trace, some, -y, and); **Inclusions** (shells, organisms, other non-soil components) **Consistency/Compactness** (v loose, loose, compact, dense, v dense; vsoft, soft, firm, stiff, v stiff, hard); **Moisture Content** (dry, moist, wet, saturated); **Colour; Structure; Contaminants** (staining/odour/sheen); **Other** (wood, debris, organisms).

- + silt + clay ; trace shell
- v dense, stiff
- light brown veneer over light to med grey ; overall light brown when mixed
- no odour, stain or sheen
- traces of minute organic debris ; 2x small polychaete

Approx % collected in grab sample: 5% - 20% ; Rep 3 = 40% %

Photograph Reference Number(s): AR phone

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Sample Control Number (SCN):

Analysis for:

- ☐ Full Metals
- ☐ Grain Size
- ☐ TOC
- ☐ Other
- ☐ PAH
- ☐ Total PCBs
- ☐ Toxicity
- ☐ PAH Fingerprinting
- ☐ AVS SEM
- ☐ LEPH/HEPH

Other Notes:

# of Grabs for Analysis:

Rep 1 = 2 grabs ; 6 attempts

Rep 2 = 3 " ; 15 "

Rep 3 = 1 ; 4

Reviewed By: AR

Chemistry

Page 1 of 1

SEDIMENT SAMPLING LOG - GRAB

Project No: 18103567 / 4000

Project Title: Meliadine Diffuser

Date: Sept 13 2018

Sampled by: AR, JG

Station Number (ID): MBE-3 Reps

Sampling Method: Petit Ponar

Weather: wind SE 5kt

Lat/Longitude: 15 V 0545991 6963294

Sampling Depth: 21 m

# of Attempts to Obtain Sample: see below

Time of Collection: 15:00 → 16:00

Sediment Description

Grain Size (boulder, cobble, gravel, sand, silt, clay; trace, some, -y, and); **Inclusions** (shells, organisms, other non-soil components) **Consistency/Compactness** (v loose, loose, compact, dense, v dense; vsoft, soft, firm, stiff, v stiff, hard); **Moisture Content** (dry, moist, wet, saturated); **Colour; Structure; Contaminants** (staining/odour/sheen); **Other** (wood, debris, organisms).

- silt + clay, v. thin light brown veneer over med / dark veined clay
- V. dense, stiff
- no odour, sheen, or stain
- no organic debris, or shell

Approx % collected in grab sample: 15-30 %

Photograph Reference Number(s): AR phone

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Sample Control Number (SCN):

Analysis for:

- ☐ Full Metals
- ☐ Grain Size
- ☐ TOC
- ☐ Other
- ☐ PAH
- ☐ Total PCBs
- ☐ Toxicity
- ☐ PAH Fingerprinting
- ☐ AVS SEM
- ☐ LEPH/HEPH

Other Notes: low tide 14:45

# of Grabs for Analysis:

Rep 1 = 3 grabs, 10 attempts

Rep 2 = 2 " ; 2 "

Rep 3 3 " ; 8 attempts

Reviewed By: _____

Chemistry

SEDIMENT SAMPLING LOG - GRAB

Project No: 18103567 - 4000
Project Title: Meliadine Dewatering
Date: Sep 13 2018
Sampled by: AR, SG
Station Number (ID): MBE-4
Sampling Method: Petit Ponar
Weather: mostly sunny ; wind 5kt W
Lat/Longitude: 15V 0546123 6963268
Sampling Depth: 19m (low tide)
# of Attempts to Obtain Sample: ↓
Time of Collection: 1400

Sediment Description
Grain Size (boulder, cobble, gravel, sand, silt, clay; trace, some, -y, and); **Inclusions** (shells, organisms, other non-soil components) **Consistency/Compactness** (v loose, loose, compact, dense, v dense; vsoft, soft, firm, stiff, v stiff, hard); **Moisture Content** (dry, moist, wet, saturated); **Colour; Structure; Contaminants** (staining/odour/sheen); **Other** (wood, debris, organisms).

- unconsolidated veneer over firm/compact silt
- light brown over light grey silt ; Rep 3 darker/med grey under layer
- trace organic debris (minute brown stringy pieces to 3mm)
- no odour, sheen, staining
- 1 polychaete ; 1 piece clam shell

Approx % collected in grab sample: 25% - 40%

Photograph Reference Number(s): andrew's phone

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Sample Control Number (SCN):

Analysis for:
- ☐ Full Metals
- ☐ Grain Size
- ☐ TOC
- ☐ Other
- ☐ PAH
- ☐ Total PCBs
- ☐ Toxicity
- ☐ PAH Fingerprinting
- ☐ AVS SEM
- ☐ LEPH/HEPH

Other Notes:

# of Grabs for Analysis:

Rep 1 : 2 grabs (2 attempts)
Rep 2 : 3 grab (4 attempts)
Rep 3 : 2 grab (3 attempts)

Reviewed By: AL

Chemistry

SEDIMENT SAMPLING LOG - GRAB

Project No: 13103567

Project Title: Mediadiz

Date: Sept 13 2018

Sampled by: A. Rippington ; J. Goodyear

Station Number (ID): MBE-5

Sampling Method: Petit Ponar

Weather: wind SW 7kt mostly sunny

Lat/Longitude: 15V 0546299 , 6963211

Sampling Depth: 21 m

# of Attempts to Obtain Sample: 1

Time of Collection: 12:20

Sediment Description

Grain Size (boulder, cobble, gravel, sand, silt, clay; trace, some, -y, and); **Inclusions** (shells, organisms, other non-soil components) **Consistency/Compactness** (v loose, loose, compact, dense, v dense; vsoft, soft, firm, stiff, v stiff, hard); **Moisture Content** (dry, moist, wet, saturated); **Colour; Structure; Contaminants** (staining/odour/sheen); **Other** (wood, debris, organisms).

- silt w/ few gravel ; no shell or worms greyish light brown
- compact & dense beneath unconsolidated 2cm veneer
- no odour, sheen or ~~staining~~ (staining Rep 2)
- ~~no organic~~ trace debris

Approx % collected in grab sample 15 20% - 30% %

Photograph Reference Number(s) :

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Sample Control Number (SCN):

Analysis for:

- ☐ Full Metals
- ☐ Grain Size
- ☐ TOC
- ☐ Other
- ☐ PAH
- ☐ Total PCBs
- ☐ Toxicity
- ☐ PAH Fingerprinting
- ☐ AVS SEM
- ☐ LEPH/HEPH

Other Notes: Sandhill crane x 56

# of Grabs for Analysis: 3 Rep 1 2 for Rep 2 & Rep 3

Rep 1, 2, 3

Reviewed By: _____

Chemistry

SEDIMENT SAMPLING LOG - GRAB

Meliadine

Project No: ~~13-1447-0183 / 2000~~ 18103567/4000

Project Title: ~~Shell~~ SQT Marine Sediment Investigation

Date: ~~October~~ Sept 19 ~~2018~~

Sampled by: AR, ~~JS, DS~~ JG

Station Number (ID): MB Ref A 1 Rep 1/2/3

Sampling Method: ~~Van Veen (Chemistry + Toxicity Samples)~~ ~~Standard Ponar (Benthic Samples)~~ Petit

Weather: mostly sun; wind 10kt SW

Lat/Longitude: 15 V 0545070 6961511

Water Depth: 21 m

Time of Collection: 0830

Sieve Mesh Size: ~~500 micron~~

Sediment Description

Grain Size (boulder, cobble, gravel, sand, silt, clay; trace, some, -y, and); **Inclusions** (shells, organisms, other non-soil components) **Consistency/Compactness** (v loose, loose, compact, dense, v dense; vsoft, soft, firm, stiff, v stiff, hard); **Moisture Content** (dry, moist, wet, saturated); **Colour; Structure; Contaminants** (staining/odour/sheen); **Other** (wood, debris, organisms).

- loose light brown 1cm veneer over med. density compact light gray
- no odour or sheen, trace orangey brown streaks in Rep 2
- dark gray streak in Rep 3
- polychaetes

Approx % Collected in Grab Sample/ Number of Attempts to Obtain Sample :

Chemistry Grab 1 45+25 Grab 2 30+30 Grab 3 20+35 2 grabs for each sample

Benthic Grab 1 ~~4~~ Grab 2 6 Grab 3 3

attempts

Photograph Reference Number(s) :

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Sample Control Number (SCN):

Analysis for: ☒ Chemistry ~~☐ Toxicity~~ ~~☐ Benthic Invertebrate Taxonomy~~

Grabs for Analysis (Chemistry and Toxicology) : 2 each

of Jars Per ~~Benthic~~ Replicate Sample: Rep 1 1 Rep 2 1 Rep 3 1

Notes:

Reviewed By: _____

Chemistry Page 1 of 1

SEDIMENT SAMPLING LOG - GRAB

Meliadine

Project No:	~~13-1447-0183 / 2000~~ 1810356 7-4000	Project Title:	~~Shell SQT~~ Marine Sediment Investigation
Date:	~~October~~ Sept 19 2013 2018	Sampled by:	~~AR, JS, DS~~ JG
Station Number (ID):	MBRy A-2	Sampling Method:	~~Van Veen (Chemistry + Toxicity Samples)~~ Standard Ponar (Benthic Samples) Petit Ponar
Weather:	mostly sun, SW 10 kt	Lat/Longitude:	15V 0545028 6961609
Water Depth:	21 m		
Sieve Mesh Size:	~~500 micron~~	Time of Collection:	945

Sediment Description
Grain Size (boulder, cobble, gravel, sand, silt, clay; trace, some, -y, and); **Inclusions** (shells, organisms, other non-soil components) **Consistency/Compactness** (v loose, loose, compact, dense, v dense; vsoft, soft, firm, stiff, v stiff, hard); **Moisture Content** (dry, moist, wet, saturated); **Colour; Structure; Contaminants** (staining/odour/sheen); **Other** (wood, debris, organisms).

- same as MBRy A-1
- light brown over med gray
- penetration to 6 cm / 7 cm
- no odour, sheen, trace darker gray stain/streak below 2cm

Approx % Collected in Grab Sample/ Number of Attempts to Obtain Sample :

Chemistry Grab 1 45+25 Grab 2 20+45 Grab 3 55

~~Benthic~~ Grab 1 _____ Grab 2 _____ Grab 3 _____

attempts 4 3 1

Photograph Reference Number(s) :

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Sample Control Number (SCN):

Analysis for: ☒ Chemistry YES ~~☐ Toxicity~~ ~~☐ Benthic Invertebrate Taxonomy~~

Grabs for Analysis (Chemistry and Toxicology) : see above 1

of Jars Per benthic Replicate Sample: Rep 1 1 Rep 2 1 Rep 3 1

Notes:

Reviewed By: _____

18103567-4000

SEDIMENT SAMPLING LOG - GRAB

Meliadine

Project No: 13-1447-0183 / 2000

Project Title: ~~Shell SQT~~ Marine Sediment Investigation

Date: Sept. ~~October~~ 19 ~~2013~~ 2018

Sampled by: ~~AR~~, JS, DS ~~JG~~

Station Number (ID): MB Ref A-3

Sampling Method: ~~Van Veen (Chemistry + Toxicity Samples)~~ Standard Ponar (Benthic Samples) Petit

Weather: Mostly Sunny Sea ~~State~~ = .3 M Wind 11 knots from WNW

Lat/Longitude: 15V 0543984 6961763

Water Depth: 21 m

Time of Collection: 12⁰⁰

Sieve Mesh Size: ~~500~~ 1000 micron

Sediment Description

Grain Size (boulder, cobble, gravel, sand, silt, clay; trace, some, -y, and); **Inclusions** (shells, organisms, other non-soil components) **Consistency/Compactness** (v loose, loose, compact, dense, v dense; vsoft, soft, firm, stiff, v stiff, hard); **Moisture Content** (dry, moist, wet, saturated); **Colour; Structure; Contaminants** (staining/odour/sheen); **Other** (wood, debris, organisms).

- light brown over med grey w/ dark grey to black pockets
- silt + clay unconsolidated over med firm / to firm beneath
- mild sulfur organic odour, no stain, or sheen
- amphipods (lots); polychaete

Approx % Collected in Grab Sample/ Number of Attempts to Obtain Sample :

Chemistry Grab 1	20+45	Grab 2	20+55	Grab 3	20+25
Benthic Grab 1	\	Grab 2	\	Grab 3	\
Attempts	3		3		3

Photograph Reference Number(s) :

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Rep 1 - pre mix

Sample Control Number (SCN):

Analysis for: ☑ Chemistry ☐ Toxicity ☐ Benthic Invertebrate Taxonomy

Grabs for Analysis (Chemistry and Toxicology) :

of Jars Per benthic Replicate Sample: Rep 1 _____ Rep 2 _____ Rep 3 _____

Notes:

Reviewed By: _____

Chain

1B103567.4000 SEDIMENT SAMPLING LOG - GRAB Meliadine

Project No:	~~13-1447-0183/2000~~	Project Title:	~~Shell SCT~~ Marine Sediment Investigation
Date:	~~October~~ Sept 19 2018	Sampled by:	AR, ~~JS, DS~~ JG
Station Number (ID):	MBRef B1	Sampling Method:	Van Veen (Chemistry + Toxicity Samples) Standard Ponar (Benthic Samples)
Weather:	sunny wind 17 kt W	Lat/Longitude:	15V 541650 6962064
Water Depth:	19 m		
Sieve Mesh Size:	500 micron 1mm	Time of Collection:	15:30

Sediment Description
Grain Size (boulder, cobble, gravel, sand, silt, clay; trace, some, -y, and); **Inclusions** (shells, organisms, other non-soil components) **Consistency/Compactness** (v loose, loose, compact, dense, v dense; vsoft, soft, firm, stiff, v stiff, hard); **Moisture Content** (dry, moist, wet, saturated); **Colour; Structure; Contaminants** (staining/odour/sheen); **Other** (wood, debris, organisms).

- gravel, sand, some silt
- fine branched brown algae; small red blades
- mixed color grey + black fines sediment
- no odour, stain, or sheen

Approx % Collected in Grab Sample/ Number of Attempts to Obtain Sample :

Chemistry Grab 1 10%, 15% & 20% Grab 2 / Grab 3 /

Benthic Grab 1 _____ Grab 2 _____ Grab 3 _____

attempts (10)

Photograph Reference Number(s) :

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Sample Control Number (SCN):

Analysis for: ☒ Chemistry ☑ Toxicity ☑ Benthic Invertebrate Taxonomy

Grabs for Analysis (Chemistry and Toxicology) : _____

of Jars Per benthic Replicate Sample: _____

Rep 1 _____ Rep 2 _____ Rep 3 _____

Notes: * several rejections due to ↑ gravel

Reviewed By: _____

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APPENDIX D

Benthic Infauna Sampling Field Logs

Benthic

SEDIMENT SAMPLING LOG - GRAB

Meliadine

Project No: ~~13-1447-0183 / 2000~~ 1810356

Project Title: ~~Shell SQT~~ Marine Sediment Investigation

Date: ~~October~~ Sept 15 2018

Sampled by: AR, ~~JS~~, DS JG

Station Number (ID): MBE 1

Sampling Method: ~~Van Veen (Chemistry + Toxicity Samples)~~, Standard Ponar (Benthic Samples) Petit

Weather: Wind 14 Gusts to 20 knots Snow Squalls then Sun

15V 0545719 6963378

Lat/Longitude:

Water Depth: 21

Sieve Mesh Size: ~~500 micron~~ 1 mm

Time of Collection: 13:36 → 15:00

Sediment Description

Grain Size (boulder, cobble, gravel, sand, silt, clay; trace, some, -y, and); **Inclusions** (shells, organisms, other non-soil components) **Consistency/Compactness** (v loose, loose, compact, dense, v dense; vsoft, soft, firm, stiff, v stiff, hard); **Moisture Content** (dry, moist, wet, saturated); **Colour; Structure; Contaminants** (staining/odour/sheen); **Other** (wood, debris, organisms).

- silt clay ; brown layer over gray ; unconsolidated veneer = ~~0.5 to~~ cm to 0.5 cm
- dense ; compact , stiffer with depth
-
- euphausid, polychaete

Approx % Collected in Grab Sample/ Number of Attempts to Obtain Sample :

~~Chemistry Grab 1~~ ~~Grab 2~~ ~~Grab 3~~

Benthic Grab 1 30+23+15 (4) Grab 2 25+40 (8) Grab 3 50+0 (4)

Photograph Reference Number(s) :

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

photos ~~#~~ lost ; memory card issue

Sample Control Number (SCN):

Analysis for: ~~☐ Chemistry~~ ~~☐ Toxicity~~ ☒ Benthic Invertebrate Taxonomy

Grabs for Analysis (Chemistry and Toxicology) :

of Jars Per benthic Replicate Sample: Rep 1 1 Rep 2 1 Rep 3 1

Notes:

very windy 17 → 20 kt

low tide ~ 16:00 0.77 m

Reviewed By: AR

18103567/4000 **SEDIMENT SAMPLING LOG - GRAB** Meliadine

Project No: ~~13-1447-0183 / 2000~~

Project Title: ~~Shell SCH~~ Marine Sediment Investigation

Date: ~~October~~ Sept 16 2013

Sampled by: AR, ~~JS, DS~~ JG

Station Number (ID): MBE - 2

Sampling Method: ~~Van Veen (Chemistry + Toxicity Samples)~~ ~~Standard~~ Ponar (Benthic Samples) Petit

Weather: part sun ; wind 15+ kt West

Lat/Longitude: 15 V 0545897 6963337

Water Depth: 22m

Time of Collection: 12:15

Sieve Mesh Size: ~~500 micron~~ 1mm

Sediment Description

Grain Size (boulder, cobble, gravel, sand, silt, clay; trace, some, -y, and); **Inclusions** (shells, organisms, other non-soil components) **Consistency/Compactness** (v loose, loose, compact, dense, v dense; vsoft, soft, firm, stiff, v stiff, hard); **Moisture Content** (dry, moist, wet, saturated); **Colour; Structure; Contaminants** (staining/odour/sheen); **Other** (wood, debris, organisms).

- unconsolidated light brown silt veneer over light gray dense, firm silt + clay
- some black inclusions - no odour
- Rep 3 clam
- poly chaete burrowing hole ; lots of worms

Approx % Collected in Grab Sample/ Number of Attempts to Obtain Sample :

Chemistry Grab 1		Grab 2	Grab 3
Benthic Grab 1	45% + 35	Grab 2	40 + 30	Grab 3	20 + 60
Attempts	2		4		4

Photograph Reference Number(s) :

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

* see photo in ponar mouth for colour & texture

Sample Control Number (SCN):

Analysis for: ~~☐ Chemistry~~ ~~☐ Toxicity~~ ☒ Benthic Invertebrate Taxonomy

Grabs for Analysis (Chemistry and Toxicology) :

of Jars Per benthic Replicate Sample: Rep 1 1 Rep 2 1 Rep 3 1

Notes:

Reviewed By:

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Benthic

18103567 SEDIMENT SAMPLING LOG - GRAB Meliadine

Project No: ~~13-1447-0183 / 2000~~

Project Title: ~~Shell SQT Marine~~ Sediment Investigation

Date: ~~October~~ Sept 14 2018

Sampled by: AR, ~~JS~~, ~~DS~~ JG

Station Number (ID): MBE-3

Sampling Method: ~~Van Veen (Chemistry + Toxicity Samples)~~ ~~Standard~~ Ponar (Benthic Samples) Petit

Weather: Mostly Sunny 6knots WNW

Lat/Longitude: 15V 0546002 6963295

Water Depth: 22-24

Time of Collection: 17:30

Sieve Mesh Size: ~~500 micron~~ 1 mm

Sediment Description

Grain Size (boulder, cobble, gravel, sand, silt, clay; trace, some, -y, and); **Inclusions** (shells, organisms, other non-soil components) **Consistency/Compactness** (v loose, loose, compact, dense, v dense; vsoft, soft, firm, stiff, v stiff, hard); **Moisture Content** (dry, moist, wet, saturated); **Colour; Structure; Contaminants** (staining/odour/sheen); **Other** (wood, debris, organisms).

- silt + clay; dull light brown
- no odor, sheen or stain
- compact; dense
- ~~no orgs. seen~~ polychaete

Approx % Collected in Grab Sample/ Number of Attempts to Obtain Sample :

~~Chemistry Grab 1~~ ~~Grab 2~~ ~~Grab 3~~

Benthic Grab 1 35+45 Grab 2 45+50 Grab 3 30%+30 +10

Attempts 2 & 2 3

Photograph Reference Number(s) :

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

photos taken @ beach / sieve

sieved for Rep 3 & 2, Rep 1 = silty/clay mass before + after

Sample Control Number (SCN):

Analysis for: ☐ Chemistry ☐ Toxicity ☒ Benthic Invertebrate Taxonomy

Grabs for Analysis (Chemistry and Toxicology) : N/A

of Jars Per benthic Replicate Sample:

Rep 1 1 Rep 2 1 Rep 3 1

Notes:

Reviewed By: _____

Benthic

SEDIMENT SAMPLING LOG - GRAB

Project No: 13103567 / 4000 ~~13-1447-0183 / 2000~~

Project Title: ~~Shell SCT~~ Meliadine Marine Sediment Investigation

Date: ~~October~~ Sept 14 ~~2018~~ 2018

Sampled by: AR, ~~JS, DS~~ JGoodyear

Station Number (ID): MBE-4

Sampling Method: ~~Van Veen (Chemistry + Toxicity Samples)~~ ~~Standard~~ Ponar (Benthic Samples) Petit

Weather: cloudy, wind NE 7kt

Lat/Longitude: 15V 0546113 6963260

Water Depth: 20 m

Time of Collection: 1330

Sieve Mesh Size: ~~500 micron~~ 1 mm

Sediment Description

Grain Size (boulder, cobble, gravel, sand, silt, clay; trace, some, -y, and); **Inclusions** (shells, organisms, other non-soil components) **Consistency/Compactness** (v loose, loose, compact, dense, v dense; vsoft, soft, firm, stiff, v stiff, hard); **Moisture Content** (dry, moist, wet, saturated); **Colour; Structure; Contaminants** (staining/odour/sheen); **Other** (wood, debris, organisms).

- silt + clay, light brown over light grey
- compact dense;
- ponar penetration to 4cm max
- polychaets - lots, amphipods

Approx % Collected in Grab Sample/ Number of Attempts to Obtain Sample :

	Grab 1	Grab 2	Grab 3
Chemistry			
Benthic	30% X 2	30+35%	35% + 35
# Attempt:	3	2	2

Photograph Reference Number(s) :

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Sample Control Number (SCN):

Analysis for: ☐ Chemistry ☐ Toxicity ☐ Benthic Invertebrate Taxonomy

Grabs for Analysis (Chemistry and Toxicology):

of Jars Per benthic Replicate Sample:

Rep 1 1 Rep 2 1 Rep 3 1

Notes:

Reviewed By: _____

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Benthic

SEDIMENT SAMPLING LOG - GRAB

18103567 Meliadine

Project No:	13~~-1447-0183-2000~~	Project Title:	~~Shell SQT~~ Marine Sediment Investigation
Date:	~~October~~ Sept 14 2018	Sampled by:	AR, ~~JS/DS~~ JG
Station Number (ID):	MBE-5	Sampling Method:	~~Van Veen (Chemistry + Toxicity Samples)~~ ~~Standard~~ Ponar (Benthic Samples) Petit
Weather:	cloudy wind 10kt N	Lat/Longitude:	1
Water Depth:	21m		
Sieve Mesh Size:	~~500 micron~~ 1mm	Time of Collection:	1030

Sediment Description
Grain Size (boulder, cobble, gravel, sand, silt, clay; trace, some, -y, and); **Inclusions** (shells, organisms, other non-soil components) **Consistency/Compactness** (v loose, loose, compact, dense, v dense; vsoft, soft, firm, stiff, v stiff, hard); **Moisture Content** (dry, moist, wet, saturated); **Colour; Structure; Contaminants** (staining/odour/sheen); **Other** (wood, debris, organisms).

- silt + clay, dull light brown
- no odour, sheen or stain; compact; dense
- clam, polychaete, capetellid

Approx % Collected in Grab Sample/ Number of Attempts to Obtain Sample :

Chemistry Grab 1		Grab 2		Grab 3	
Benthic Grab 1	40+30	Grab 2	35+35	Grab 3	50+40
Attempts:	3		2		2

Photograph Reference Number(s) :

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Sample Control Number (SCN):

Analysis for: ☐ Chemistry ☐ Toxicity ☒ Benthic Invertebrate Taxonomy

# Grabs for Analysis (Chemistry and Toxicology) :	N/A	# of Jars Per benthic Replicate Sample:	Rep 1 1 Rep 2 1 Rep 3 1

Notes:

Reviewed By:

Benthic Inv.

1810367-4000

SEDIMENT SAMPLING LOG - GRAB

Project No: ~~13-1447-0183 / 2000~~

Project Title: Shell SQT Marine Sediment Investigation

Date: ~~October~~ Sept 16 ~~2013~~ 2018

Sampled by: ~~AR, JS, DS~~ JG

Station Number (ID): MBRefA Site1

Sampling Method: ~~Van Veen (Chemistry + Toxicity Samples)~~ ~~Standard~~ Ponar (Benthic Samples) Petit

Weather: Full overcast; Wind 16kts

Lat/Longitude: 0545068 / 6961511

Water Depth: 21M

Sieve Mesh Size: ~~500 micron~~ 1mm

Time of Collection: 15:04

Sediment Description

Grain Size (boulder, cobble, gravel, sand, silt, clay; trace, some, -y, and); **Inclusions** (shells, organisms, other non-soil components) **Consistency/Compactness** (v loose, loose, compact, dense, v dense; vsoft, soft, firm, stiff, v stiff, hard); **Moisture Content** (dry, moist, wet, saturated); **Colour; Structure; Contaminants** (staining/odour/sheen); **Other** (wood, debris, organisms).

- silt + clay light brown unconsolidated 1cm over increasing density light grey. few darker inclusions
- penetration to 7cm firm, not dense like Itivia samples
- polychaete no odour, stain or sheen

Approx % Collected in Grab Sample/ Number of Attempts to Obtain Sample : white crystalline unknown 1cm x 2mm cylinder

~~Chemistry Grab 1~~ ~~Grab 2~~ ~~Grab 3~~

Benthic Grab 1 65+65 Grab 2 25+20 Grab 3 20+20

Attempts 5 10 11

Photograph Reference Number(s) :

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Sample Control Number (SCN):

Analysis for: ☑ Chemistry ☐ Toxicity ☑ Benthic Invertebrate Taxonomy

Grabs for Analysis (Chemistry and Toxicology) :

of Jars Per benthic Replicate Sample: Rep 1 1 Rep 2 1 Rep 3 1

Notes:

Reviewed By: AR

Infauna

SEDIMENT SAMPLING LOG - GRAB

18035867 / 4000

Project No:	13-1447-0183 / 2000	Project Title:	Shell SQT Marine Sediment Investigation
Date:	~~October~~ Sept 18 2013	Sampled by:	AR, ~~JS~~, DS JG
Station Number (ID):	MBReg A-2	Sampling Method:	Van Veen ~~(Chemistry + Toxicity Samples)~~ ~~Standard~~ Ponar (Benthic Samples)
Weather:	Cloudy wind 20 kt W	Lat/Longitude:	15 V 0545028 / 6961609
Water Depth:	20 m		
Sieve Mesh Size:	~~500 micron~~ 1mm	Time of Collection:	1715 - 1810

Sediment Description
Grain Size (boulder, cobble, gravel, sand, silt, clay; trace, some, -y, and); **Inclusions** (shells, organisms, other non-soil components) **Consistency/Compactness** (v loose, loose, compact, dense, v dense; vsoft, soft, firm, stiff, v stiff, hard); **Moisture Content** (dry, moist, wet, saturated); **Colour; Structure; Contaminants** (staining/odour/sheen); **Other** (wood, debris, organisms).

same as Rep A Site

less dense than MBE sites

Approx % Collected in Grab Sample/ Number of Attempts to Obtain Sample :

Chemistry Grab 1	✓	Grab 2	✓	Grab 3	✓
Benthic Grab 1	30+55 / 5	Grab 2	45+55 / 2	Grab 3	30+50 / 7

Photograph Reference Number(s) :

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Sample Control Number (SCN):

Analysis for: ☐ ~~Chemistry~~ ☐ ~~Toxicity~~ ☑ Benthic Invertebrate Taxonomy

# Grabs for Analysis (Chemistry and Toxicology) :	✓	# of Jars Per benthic Replicate Sample:	Rep 1 1 Rep 2 1 Rep 3 1

Notes:

Reviewed By: AR

Infauna

Page 1 of 1

18103567-4000

SEDIMENT SAMPLING LOG - GRAB

Project No: 13-1447-0183 / 2000

Project Title: Shell SQT Marine Sediment Investigation

Date: Sept. ~~October~~ 19 2013

Sampled by: AR, JS, DS / JG

Station Number (ID): MB Ref A 3

Sampling Method: ~~Van Veen (Chemistry + Toxicity Samples)~~ Standard Ponar (Benthic Samples)

Weather: Mostly sunny seas: calm Wind 15 kts W

Lat/Longitude: ~~[illegible]~~

Water Depth: 21

Time of Collection: 13:01

Sieve Mesh Size: ~~500 micron~~ 1 mm

Sediment Description

Grain Size (boulder, cobble, gravel, sand, silt, clay; trace, some, -y, and); **Inclusions** (shells, organisms, other non-soil components) **Consistency/Compactness** (v loose, loose, compact, dense, v dense; vsoft, soft, firm, stiff, v stiff, hard); **Moisture Content** (dry, moist, wet, saturated); **Colour; Structure; Contaminants** (staining/odour/sheen); **Other** (wood, debris, organisms).

- silt & clay - brown over gray
- penetration to 6cm
- trace small gravel
- Rep 3 algae + mussel
  Gred bladed & laminaria

Approx % Collected in Grab Sample/ Number of Attempts to Obtain Sample :

Chemistry Grab 1		Grab 2	Grab 3
Benthic Grab 1	40+30 / 2	Grab 2	25+40 / 4	Grab 3	50+ / 1

Photograph Reference Number(s) :

Photograph Notes (grab, sampling location, field sampling methods, public use, etc):

Sample Control Number (SCN):

Analysis for: ☐ ~~Chemistry~~ ☐ ~~Toxicity~~ ☑ Benthic Invertebrate Taxonomy

Grabs for Analysis (Chemistry and Toxicology) :

of Jars Per benthic Replicate Sample: Rep 1 | Rep 2 | Rep 3 |

Notes:

Reviewed By: _____

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APPENDIX E

Intertidal Survey Data Sheets

Location: start 15V 0546036 696 3605 T1TOP Meliadine - Diffuser

Date: Sept 14 2018

Subtidal Bi[illegible] Survey Transect 1

Data Recorded: A. Ripp

	Bedrock / Boulder	Cobble / Gravel	Sand / Silt + Clay	Detritus (Y/N) / [crossed out]	Fucus / Grass	Filament Green / string brown	green encrusting / string ulva	Mussel / Clam siphon	Littorina / limpet	Brown Filament			
Distance: 1440 Depth: OHW Time: 1440 Ø m				Y (50%) /	/ 100								
Notes: Photo E, N, W, S detrital fucus @ OHW													
Distance: 1445 Depth: Time: 7m	/ 80	/ 18	/ 4		/ 6								
Notes:													
Distance: Depth: 14m Time: 1448	/ 4	36 / 59	/ 1				1 /						
Notes: end of grass @ ~18m													
Distance: 21 Depth: Time: 1450	/ 78	10 / 12											
Notes:													
Distance: Depth: 23 Time: 1455		12 / 87	1 /			3 /	/ 30			4 /			
Notes:													
Distance: Depth: 35 Time: 1508	/ 16	16 / 62	3 / 3	Y(<1) /									
Notes: anthropogenic - metal cable, bike, laminate sheeting													

Data Reviewed By:

Location: Mahadine

Date:

Pg 2 TransT 1

Subtidal Biological Survey

Data Recorded: AR ipp

	Bould	Cob / Gr	sand / silt	shell	detritus	Fucus / tar spot	littorina / amphipod	brown filament / stringy brown	cladophora / mussel					
Distance: Depth: Time: 42m 15[10]		5 / 35	48 / 10	2	Y									
Notes: gravel/boulder ends @ ~40m ; fucus nearby														
Distance: Depth: Time: 49m 15[15]		/ 16	70 / 14	<1										
Notes: snail trail														
Distance: Depth: Time: 56m 15[20]	/ 17	2 / 4	64 / 11	2										
Notes: standing H_2O ; tide change @ ~15[00]														
Distance: Depth: 63 Time: 15[28]		7 / 3	70 / 15	4		3 / 1	80 / 3	2						
Notes: littorina size range 2mm → 7mm Littorina sitkana ?														
Distance: Depth: 70 Time: 15[32]		2 / 10	70 / 13	5			33	/ 2						
Notes: fucus <1% nearby ; 2mm → 5mm														
Distance: Depth: Time: 77	/ 6	12 / 6	65 / 9			55	33	/ 5	7 / 1					
Notes: snail 2mm → 6mm , mussel = 3.3cm														

Data Reviewed By:

Location:

Date: Sept 14 2018 13103567 (Pg 3) T1 3 of 3

Subtidal Biop tal Survey END 15V 0546131 6963519

Data Recorded By: AR

	Boulder	Cob / Gravel	sand / silt	shell / detritus	Fucus / stringy brown	cladophora / filament green	filament brown / tar spot	littorine / mussel	annelid worm / ascidian or anemone	grass / succulent	small gr. alg.		
Distance: Depth: Time: 84m 1540		8 / 7	65 / 20	<1	8	1	<1	8 / 3	(1)				
Notes: woman mound ; snail 2mm-6mm ; mussel 3cm → 5cm													
Distance: Depth: Time: 91 1547	85	13 / 2	<1 / <1		55			3			many (~40)	<2mm	
Notes: waterline 16.9 + 84 = (100.9) @ 1547 ; ~~difficult to determine substrate~~ ; cut-off for littoria = 2mm													
Distance: Depth: Time: 98 1555	-	20 / 76	3 / 2	<1	16 / <1		<1	12 / 2-6mm	mussel / 9 3cm-4cm				
Notes: interstitial silt + sand | abundant fauna @ 91m below rocks ; mild organic decay odour when turning rocks													
Distance: Depth: Time: T2 0m 16:17	25	35 / 15	10	Yes 45%						(15)			
Notes: start 15V 0546037 " 6963558 T2 TOP " | substrate % incl. grass |													
Distance: Depth: Time: 7m	95	45 / 10		Y						4	3		
Notes:													
Distance: Depth: Time: 14 16:27	40	35 / 25									2		
Notes:													

increased mussel @ waterline

T2

Page 1 of 2 for T2

Data Reviewed By:

Location: Meliadine 1810356 7/4000

Date: Sept 14 2018

Subtidal Biophysical Survey Diffuser T2

Data Recorded By: ARipp

	Bare / Cobble	gravel / sand	silt / shell	small encr grn	filament grn		l. Horn						
Distance: Depth: Time: 21m 1632	32	40 / 2	26	12	2								
Notes:													
Distance: Depth: Time: 28 1636	26 / 60	14											
Notes: silt veneer on substrate													
Distance: Depth: 35 Time: 1638	90 / 5	3 / 1	1 / <1										
Notes:													
Distance: Depth: 42m Time: 1640	3 / 10	86 / 1	<1				6						
Notes:													
Distance: Depth: 49m Time: 1642	8 / 5	57 / 10	20				22						
Notes: snail 2mm → 4mm; mostly small fucus band extends for ~20m below waterline (x/m elev.)													
Distance: Depth: Time:													
Notes: waterline 52.7m @ 1645 ; abundant (5-10%) stringy brown in shallow subtidal													

@ Diffuser T2 END 15V 0546054 6963507

Data Reviewed By:

T1 "TOP"
"Ref Start"
15V 0545395
6963954

"T1 Ref END"
0545392
69639223

Ref T1

Meliadine 18103567 - 4000

Location: Ref 1 - ~~not~~ west Itivia

Date: Sep 15 2018

Subtidal Bio[illegible]al Survey A.R

	Bo / Co	GR / Sand	Silt / Shell	Moss grass soil complex	ENC. Algae	Grass veg	Detritus			
Distance: 0 Depth: Time:	55	38	2	8		(10)	Y - fucus + kelp stipe			
Notes: soil moss overlies (most likely) cobble / gravel mix										
Distance: 7 Depth: Time:	50 / 35	15			2					
Notes: no algae or veg nearby										
Distance: 14 Depth: Time:	70	30			6					
Notes: Large Gravel ... ENC. Algae is black, almost tar spot / lichenesque										
Distance: 21 Depth: Time:	7	86 / 2	4 / <1							
Notes:										
Distance: 28 Depth: Time: 16:10	Bo Co (30)	GR ([illegible]) Sand (2)	Silt (2) <1							
Notes: near waterline ~5% Fucus cover on larger substrate (up to ~5m above)										
Distance: Depth: Time:		some fucus (<5%) subtidal								
Notes: Waterline 16:10 @ 31.0m ; low tide @ ~15:55										

 0.77m

1363567-4020

Location: T2 REF Stat 15V 0545335 6963972 END 15V 0545326 6963947

Date: Sept 15 2018 Subtidal Bio Survey Data Recorded ARI PP

	Bo / Cob	Gravel / Sand	Silt / shell	detritus / grass		soil / grass complex	fucus / thick encrust alg						
Distance: 0 Depth: Time: 16⁵⁰	30 / 25	25	5	Y (12%) / 5		10							
Notes: moss in complex soil grass ; fucus ~2% within 10% of waterline E&W													
Distance: Depth: 7 Time:	30 / 15	55											
Notes: boulder cobble zone from 0m → 7m profile: B/Co sand fucus													
Distance: Depth: 14 Time:	2 / 70	26 / 2					<1						
Notes: large cobble ~w													
Distance: Depth: 21 Time:	35 / 10	5 / 45	3 / 2	Y									
Notes:													
Distance: Depth: 28 Time: 17⁰⁰	70	30					2 / 3						
Notes: waterline 27.5m @ 17⁰⁰ ; low tide @ ~15⁵⁵													
Distance: Depth: Time: 35													
Notes: fairly consistent grade overall w/ nearby flat sandy pockets @ ~15m → 25m steeper than exposed site													

REF T2

Data Reviewed By: depends on

APPENDIX F

Marine Water Quality Analytical Results

Agnico-Eagle - Meliadine Gold Project
ATTN: JENNIFER BROWN
PO Box 99
Rankin Inlet NU X0C 0G0

Date Received: 21-SEP-18
Report Date: 19-OCT-18 14:03 (MT)
Version: FINAL

Client Phone: 819-759-7555

Certificate of Analysis

Lab Work Order #: L2168530

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: 14-452765
Legal Site Desc:

Hua Wo
Chemistry Laboratory Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-1 WW1S							
Sampled By: CLIENT on 17-SEP-18 @ 18:15							
Matrix: marine H2O							
Alkalinity Species by Titration							
Alkalinity Spec by Titration (Seawater)							
Alkalinity, Bicarbonate (as CaCO3)	113		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Carbonate (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Hydroxide (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Total (as CaCO3)	113		1.0	mg/L		26-SEP-18	R4245590
Anions by Ion Chromatography (seawater)							
Bromide by IC (seawater)							
Bromide (Br)	55.5		5.0	mg/L		25-SEP-18	R4243309
Chloride by IC (seawater)							
Chloride (Cl)	16000		50	mg/L		25-SEP-18	R4243309
Fluoride by IC (seawater)							
Fluoride (F)	<1.0		1.0	mg/L		25-SEP-18	R4243309
Nitrate in Seawater by IC							
Nitrate (as N)	<0.50		0.50	mg/L		25-SEP-18	R4243309
Nitrite in Seawater by IC							
Nitrite (as N)	<0.10		0.10	mg/L		25-SEP-18	R4243309
Sulfate by IC (seawater)							
Sulfate (SO4)	2280		30	mg/L		25-SEP-18	R4243309
Dissolved ICPOES & HR-ICPMS in Seawater							
Diss. Metals in Seawater by HR-ICPMS							
Dissolved Metals Filtration Location	LAB					01-OCT-18	R4254272
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Antimony (Sb)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Arsenic (As)-Dissolved	<0.0020		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Barium (Ba)-Dissolved	0.0094		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Beryllium (Be)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Bismuth (Bi)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Boron (B)-Dissolved	3.76		0.10	mg/L	01-OCT-18	18-OCT-18	R4286768
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Calcium (Ca)-Dissolved	349		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Cesium (Cs)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Cobalt (Co)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Copper (Cu)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Gallium (Ga)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	01-OCT-18	18-OCT-18	R4286768
Lead (Pb)-Dissolved	<0.00030		0.00030	mg/L	01-OCT-18	18-OCT-18	R4286768
Lithium (Li)-Dissolved	0.193		0.020	mg/L	01-OCT-18	18-OCT-18	R4286768
Magnesium (Mg)-Dissolved	1000		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Manganese (Mn)-Dissolved	0.00073		0.00020	mg/L	01-OCT-18	18-OCT-18	R4286768
Molybdenum (Mo)-Dissolved	0.0117		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Potassium (K)-Dissolved	332		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Rhenium (Re)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Rubidium (Rb)-Dissolved	0.103		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Selenium (Se)-Dissolved	0.0021		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Silicon (Si)-Dissolved	<1.0		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L	01-OCT-18	18-OCT-18	R4286768
Sodium (Na)-Dissolved	9190		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Strontium (Sr)-Dissolved	5.41		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Sulfur (S)-Dissolved	740		5.0	mg/L	01-OCT-18	18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-1 WW1S							
Sampled By: CLIENT on 17-SEP-18 @ 18:15							
Matrix: marine H2O							
Diss. Metals in Seawater by HR-ICPMS							
Tellurium (Te)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thallium (Tl)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thorium (Th)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tin (Sn)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Titanium (Ti)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tungsten (W)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Uranium (U)-Dissolved	0.00295		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Vanadium (V)-Dissolved	0.00117		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Yttrium (Y)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Zinc (Zn)-Dissolved	<0.0030		0.0030	mg/L	01-OCT-18	18-OCT-18	R4286768
Zirconium (Zr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Total ICPOES & HR-ICPMS in Seawater							
Hardness							
Hardness (as CaCO3)	4990		4.8	mg/L		18-OCT-18	
Tot. Metals in Seawater by HR-ICPMS							
Aluminum (Al)-Total	0.0321		0.0050	mg/L		18-OCT-18	R4286768
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Arsenic (As)-Total	<0.0020		0.0020	mg/L		18-OCT-18	R4286768
Barium (Ba)-Total	0.0092		0.0010	mg/L		18-OCT-18	R4286768
Beryllium (Be)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Boron (B)-Total	3.81		0.10	mg/L		18-OCT-18	R4286768
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Calcium (Ca)-Total	368		1.0	mg/L		18-OCT-18	R4286768
Cesium (Cs)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Chromium (Cr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Cobalt (Co)-Total	0.000058		0.000050	mg/L		18-OCT-18	R4286768
Copper (Cu)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Gallium (Ga)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Iron (Fe)-Total	0.042		0.010	mg/L		18-OCT-18	R4286768
Lead (Pb)-Total	<0.00030		0.00030	mg/L		18-OCT-18	R4286768
Lithium (Li)-Total	0.201		0.020	mg/L		18-OCT-18	R4286768
Magnesium (Mg)-Total	1030		1.0	mg/L		18-OCT-18	R4286768
Manganese (Mn)-Total	0.00140		0.00020	mg/L		18-OCT-18	R4286768
Molybdenum (Mo)-Total	0.0114		0.0020	mg/L		18-OCT-18	R4286768
Nickel (Ni)-Total	0.00059		0.00050	mg/L		18-OCT-18	R4286768
Phosphorus (P)-Total	<0.050		0.050	mg/L		18-OCT-18	R4286768
Potassium (K)-Total	347		1.0	mg/L		18-OCT-18	R4286768
Rhenium (Re)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Rubidium (Rb)-Total	0.108		0.0050	mg/L		18-OCT-18	R4286768
Selenium (Se)-Total	0.0021		0.0020	mg/L		18-OCT-18	R4286768
Silicon (Si)-Total	<1.0		1.0	mg/L		18-OCT-18	R4286768
Silver (Ag)-Total	<0.00010		0.00010	mg/L		18-OCT-18	R4286768
Sodium (Na)-Total	9400		1.0	mg/L		18-OCT-18	R4286768
Strontium (Sr)-Total	5.53		0.010	mg/L		18-OCT-18	R4286768
Sulfur (S)-Total	769		5.0	mg/L		18-OCT-18	R4286768
Tellurium (Te)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Thallium (Tl)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Thorium (Th)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Tin (Sn)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Titanium (Ti)-Total	0.0053		0.0050	mg/L		18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-1 WW1S							
Sampled By: CLIENT on 17-SEP-18 @ 18:15							
Matrix: marine H2O							
Tot. Metals in Seawater by HR-ICPMS							
Tungsten (W)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Uranium (U)-Total	0.00308		0.000050	mg/L		18-OCT-18	R4286768
Vanadium (V)-Total	0.00130		0.00050	mg/L		18-OCT-18	R4286768
Yttrium (Y)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		18-OCT-18	R4286768
Zirconium (Zr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-OCT-18	R4257962
Conductivity	46500		2.0	uS/cm		26-SEP-18	R4245590
Orthophosphate-Dissolved (as P)	0.0175		0.0010	mg/L		22-SEP-18	R4233408
Dissolved Organic Carbon	1.43		0.50	mg/L		25-SEP-18	R4245104
Silicate (as SiO2)	0.363		0.010	mg/L		03-OCT-18	R4258600
Total Kjeldahl Nitrogen	0.135		0.050	mg/L	28-SEP-18	01-OCT-18	R4254028
Total Organic Carbon	1.46		0.50	mg/L		25-SEP-18	R4245103
Total Dissolved Solids	35400		80	mg/L		25-SEP-18	R4247695
Mercury (Hg)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4241691
Phosphorus (P)-Total	0.0248		0.0040	mg/L		22-SEP-18	R4233751
Total Suspended Solids	2.0		2.0	mg/L		24-SEP-18	R4239893
pH	7.96		0.10	pH		26-SEP-18	R4245590
Salinity	30.5		1.0	psu		29-SEP-18	
Diss. Mercury in Seawater by CVAFS							
Dissolved Mercury Filtration Location	LAB					25-SEP-18	R4239017
Mercury (Hg)-Dissolved	<0.000010		0.000010	mg/L	25-SEP-18	25-SEP-18	R4238273
L2168530-2 WW1D							
Sampled By: CLIENT on 17-SEP-18 @ 18:15							
Matrix: marine H2O							
Alkalinity Species by Titration							
Alkalinity Spec by Titration (Seawater)							
Alkalinity, Bicarbonate (as CaCO3)	113		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Carbonate (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Hydroxide (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Total (as CaCO3)	113		1.0	mg/L		26-SEP-18	R4245590
Anions by Ion Chromatography (seawater)							
Bromide by IC (seawater)							
Bromide (Br)	57.5		5.0	mg/L		25-SEP-18	R4243309
Chloride by IC (seawater)							
Chloride (Cl)	16800		50	mg/L		25-SEP-18	R4243309
Fluoride by IC (seawater)							
Fluoride (F)	<1.0		1.0	mg/L		25-SEP-18	R4243309
Nitrate in Seawater by IC							
Nitrate (as N)	<0.50		0.50	mg/L		25-SEP-18	R4243309
Nitrite in Seawater by IC							
Nitrite (as N)	<0.10		0.10	mg/L		25-SEP-18	R4243309
Sulfate by IC (seawater)							
Sulfate (SO4)	2390		30	mg/L		25-SEP-18	R4243309
Dissolved ICPOES & HR-ICPMS in Seawater							
Diss. Metals in Seawater by HR-ICPMS							
Dissolved Metals Filtration Location	LAB					01-OCT-18	R4254272
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Antimony (Sb)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-2 WW1D							
Sampled By: CLIENT on 17-SEP-18 @ 18:15							
Matrix: marine H2O							
Diss. Metals in Seawater by HR-ICPMS							
Arsenic (As)-Dissolved	<0.0020		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Barium (Ba)-Dissolved	0.0099		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Beryllium (Be)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Bismuth (Bi)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Boron (B)-Dissolved	4.11		0.10	mg/L	01-OCT-18	18-OCT-18	R4286768
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Calcium (Ca)-Dissolved	358		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Cesium (Cs)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Cobalt (Co)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Copper (Cu)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Gallium (Ga)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	01-OCT-18	18-OCT-18	R4286768
Lead (Pb)-Dissolved	<0.00030		0.00030	mg/L	01-OCT-18	18-OCT-18	R4286768
Lithium (Li)-Dissolved	0.206		0.020	mg/L	01-OCT-18	18-OCT-18	R4286768
Magnesium (Mg)-Dissolved	1040		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Manganese (Mn)-Dissolved	0.00078		0.00020	mg/L	01-OCT-18	18-OCT-18	R4286768
Molybdenum (Mo)-Dissolved	0.0120		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Nickel (Ni)-Dissolved	0.00054		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Potassium (K)-Dissolved	343		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Rhenium (Re)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Rubidium (Rb)-Dissolved	0.111		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Selenium (Se)-Dissolved	0.0033		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Silicon (Si)-Dissolved	<1.0		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L	01-OCT-18	18-OCT-18	R4286768
Sodium (Na)-Dissolved	9380		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Strontium (Sr)-Dissolved	5.43		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Sulfur (S)-Dissolved	770		5.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Tellurium (Te)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thallium (Tl)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thorium (Th)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tin (Sn)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Titanium (Ti)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tungsten (W)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Uranium (U)-Dissolved	0.00310		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Vanadium (V)-Dissolved	0.00129		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Yttrium (Y)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Zinc (Zn)-Dissolved	<0.0030		0.0030	mg/L	01-OCT-18	18-OCT-18	R4286768
Zirconium (Zr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Total ICPOES & HR-ICPMS in Seawater							
Hardness							
Hardness (as CaCO3)	5180		4.8	mg/L		18-OCT-18	
Tot. Metals in Seawater by HR-ICPMS							
Aluminum (Al)-Total	0.0242		0.0050	mg/L		18-OCT-18	R4286768
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Arsenic (As)-Total	<0.0020		0.0020	mg/L		18-OCT-18	R4286768
Barium (Ba)-Total	0.0093		0.0010	mg/L		18-OCT-18	R4286768
Beryllium (Be)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Boron (B)-Total	3.85		0.10	mg/L		18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-2 WW1D							
Sampled By: CLIENT on 17-SEP-18 @ 18:15							
Matrix: marine H2O							
Tot. Metals in Seawater by HR-ICPMS							
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Calcium (Ca)-Total	357		1.0	mg/L		18-OCT-18	R4286768
Cesium (Cs)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Chromium (Cr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Cobalt (Co)-Total	0.000087		0.000050	mg/L		18-OCT-18	R4286768
Copper (Cu)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Gallium (Ga)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Iron (Fe)-Total	0.035		0.010	mg/L		18-OCT-18	R4286768
Lead (Pb)-Total	<0.00030		0.00030	mg/L		18-OCT-18	R4286768
Lithium (Li)-Total	0.197		0.020	mg/L		18-OCT-18	R4286768
Magnesium (Mg)-Total	1040		1.0	mg/L		18-OCT-18	R4286768
Manganese (Mn)-Total	0.00128		0.00020	mg/L		18-OCT-18	R4286768
Molybdenum (Mo)-Total	0.0115		0.0020	mg/L		18-OCT-18	R4286768
Nickel (Ni)-Total	0.00066		0.00050	mg/L		18-OCT-18	R4286768
Phosphorus (P)-Total	<0.050		0.050	mg/L		18-OCT-18	R4286768
Potassium (K)-Total	333		1.0	mg/L		18-OCT-18	R4286768
Rhenium (Re)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Rubidium (Rb)-Total	0.106		0.0050	mg/L		18-OCT-18	R4286768
Selenium (Se)-Total	0.0028		0.0020	mg/L		18-OCT-18	R4286768
Silicon (Si)-Total	<1.0		1.0	mg/L		18-OCT-18	R4286768
Silver (Ag)-Total	<0.00010		0.00010	mg/L		18-OCT-18	R4286768
Sodium (Na)-Total	9210		1.0	mg/L		18-OCT-18	R4286768
Strontium (Sr)-Total	5.55		0.010	mg/L		18-OCT-18	R4286768
Sulfur (S)-Total	775		5.0	mg/L		18-OCT-18	R4286768
Tellurium (Te)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Thallium (Tl)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Thorium (Th)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Tin (Sn)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Titanium (Ti)-Total	0.0053		0.0050	mg/L		18-OCT-18	R4286768
Tungsten (W)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Uranium (U)-Total	0.00298		0.000050	mg/L		18-OCT-18	R4286768
Vanadium (V)-Total	0.00139		0.00050	mg/L		18-OCT-18	R4286768
Yttrium (Y)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		18-OCT-18	R4286768
Zirconium (Zr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-OCT-18	R4257962
Conductivity	46000		2.0	uS/cm		26-SEP-18	R4245590
Orthophosphate-Dissolved (as P)	0.0177		0.0010	mg/L		22-SEP-18	R4233408
Dissolved Organic Carbon	1.38		0.50	mg/L		25-SEP-18	R4245104
Silicate (as SiO2)	0.346		0.010	mg/L		03-OCT-18	R4258600
Total Kjeldahl Nitrogen	0.132		0.050	mg/L	28-SEP-18	01-OCT-18	R4254028
Total Organic Carbon	1.45		0.50	mg/L		25-SEP-18	R4245103
Total Dissolved Solids	34300		80	mg/L		25-SEP-18	R4247695
Mercury (Hg)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4241691
Phosphorus (P)-Total	0.0267		0.0040	mg/L		22-SEP-18	R4233751
Total Suspended Solids	2.7		2.0	mg/L		24-SEP-18	R4239893
pH	7.97		0.10	pH		26-SEP-18	R4245590
Salinity	30.2		1.0	psu		29-SEP-18	
Diss. Mercury in Seawater by CVAFS							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-2 WW1D							
Sampled By: CLIENT on 17-SEP-18 @ 18:15							
Matrix: marine H2O							
Diss. Mercury in Seawater by CVAFS							
Dissolved Mercury Filtration Location	LAB					25-SEP-18	R4239017
Mercury (Hg)-Dissolved	<0.000010		0.000010	mg/L	25-SEP-18	25-SEP-18	R4238273
L2168530-3 MWE-1S							
Sampled By: CLIENT on 17-SEP-18 @ 18:45							
Matrix: marine H2O							
Alkalinity Species by Titration							
Alkalinity Spec by Titration (Seawater)							
Alkalinity, Bicarbonate (as CaCO3)	114		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Carbonate (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Hydroxide (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Total (as CaCO3)	114		1.0	mg/L		26-SEP-18	R4245590
Anions by Ion Chromatography (seawater)							
Bromide by IC (seawater)							
Bromide (Br)	58.2		5.0	mg/L		25-SEP-18	R4243309
Chloride by IC (seawater)							
Chloride (Cl)	16800		50	mg/L		25-SEP-18	R4243309
Fluoride by IC (seawater)							
Fluoride (F)	<1.0		1.0	mg/L		25-SEP-18	R4243309
Nitrate in Seawater by IC							
Nitrate (as N)	<0.50		0.50	mg/L		25-SEP-18	R4243309
Nitrite in Seawater by IC							
Nitrite (as N)	0.29		0.10	mg/L		25-SEP-18	R4243309
Sulfate by IC (seawater)							
Sulfate (SO4)	2380		30	mg/L		25-SEP-18	R4243309
Dissolved ICPOES & HR-ICPMS in Seawater							
Diss. Metals in Seawater by HR-ICPMS							
Dissolved Metals Filtration Location	LAB					01-OCT-18	R4254272
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Antimony (Sb)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Arsenic (As)-Dissolved	<0.0020		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Barium (Ba)-Dissolved	0.0085		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Beryllium (Be)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Bismuth (Bi)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Boron (B)-Dissolved	3.96		0.10	mg/L	01-OCT-18	18-OCT-18	R4286768
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Calcium (Ca)-Dissolved	358		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Cesium (Cs)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Cobalt (Co)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Copper (Cu)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Gallium (Ga)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	01-OCT-18	18-OCT-18	R4286768
Lead (Pb)-Dissolved	<0.00030		0.00030	mg/L	01-OCT-18	18-OCT-18	R4286768
Lithium (Li)-Dissolved	0.203		0.020	mg/L	01-OCT-18	18-OCT-18	R4286768
Magnesium (Mg)-Dissolved	997		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Manganese (Mn)-Dissolved	0.00071		0.00020	mg/L	01-OCT-18	18-OCT-18	R4286768
Molybdenum (Mo)-Dissolved	0.0114		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Nickel (Ni)-Dissolved	0.00063		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Potassium (K)-Dissolved	343		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Rhenium (Re)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-3 MWE-1S							
Sampled By: CLIENT on 17-SEP-18 @ 18:45							
Matrix: marine H2O							
Diss. Metals in Seawater by HR-ICPMS							
Rubidium (Rb)-Dissolved	0.106		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Selenium (Se)-Dissolved	0.0024		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Silicon (Si)-Dissolved	<1.0		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L	01-OCT-18	18-OCT-18	R4286768
Sodium (Na)-Dissolved	9360		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Strontium (Sr)-Dissolved	5.40		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Sulfur (S)-Dissolved	732		5.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Tellurium (Te)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thallium (Tl)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thorium (Th)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tin (Sn)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Titanium (Ti)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tungsten (W)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Uranium (U)-Dissolved	0.00304		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Vanadium (V)-Dissolved	0.00120		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Yttrium (Y)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Zinc (Zn)-Dissolved	<0.0030		0.0030	mg/L	01-OCT-18	18-OCT-18	R4286768
Zirconium (Zr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Total ICPOES & HR-ICPMS in Seawater							
Hardness							
Hardness (as CaCO3)	5000		4.8	mg/L		18-OCT-18	
Tot. Metals in Seawater by HR-ICPMS							
Aluminum (Al)-Total	0.0309		0.0050	mg/L		18-OCT-18	R4286768
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Arsenic (As)-Total	<0.0020		0.0020	mg/L		18-OCT-18	R4286768
Barium (Ba)-Total	0.0090		0.0010	mg/L		18-OCT-18	R4286768
Beryllium (Be)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Boron (B)-Total	3.95		0.10	mg/L		18-OCT-18	R4286768
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Calcium (Ca)-Total	359		1.0	mg/L		18-OCT-18	R4286768
Cesium (Cs)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Chromium (Cr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Cobalt (Co)-Total	0.000064		0.000050	mg/L		18-OCT-18	R4286768
Copper (Cu)-Total	0.00055		0.00050	mg/L		18-OCT-18	R4286768
Gallium (Ga)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Iron (Fe)-Total	0.043		0.010	mg/L		18-OCT-18	R4286768
Lead (Pb)-Total	0.00048		0.00030	mg/L		18-OCT-18	R4286768
Lithium (Li)-Total	0.205		0.020	mg/L		18-OCT-18	R4286768
Magnesium (Mg)-Total	1030		1.0	mg/L		18-OCT-18	R4286768
Manganese (Mn)-Total	0.00137		0.00020	mg/L		18-OCT-18	R4286768
Molybdenum (Mo)-Total	0.0114		0.0020	mg/L		18-OCT-18	R4286768
Nickel (Ni)-Total	0.00066		0.00050	mg/L		18-OCT-18	R4286768
Phosphorus (P)-Total	<0.050		0.050	mg/L		18-OCT-18	R4286768
Potassium (K)-Total	346		1.0	mg/L		18-OCT-18	R4286768
Rhenium (Re)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Rubidium (Rb)-Total	0.106		0.0050	mg/L		18-OCT-18	R4286768
Selenium (Se)-Total	0.0024		0.0020	mg/L		18-OCT-18	R4286768
Silicon (Si)-Total	<1.0		1.0	mg/L		18-OCT-18	R4286768
Silver (Ag)-Total	<0.00010		0.00010	mg/L		18-OCT-18	R4286768
Sodium (Na)-Total	9420		1.0	mg/L		18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-3 MWE-1S							
Sampled By: CLIENT on 17-SEP-18 @ 18:45							
Matrix: marine H2O							
Tot. Metals in Seawater by HR-ICPMS							
Strontium (Sr)-Total	5.34		0.010	mg/L		18-OCT-18	R4286768
Sulfur (S)-Total	746		5.0	mg/L		18-OCT-18	R4286768
Tellurium (Te)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Thallium (Tl)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Thorium (Th)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Tin (Sn)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Titanium (Ti)-Total	<0.0050		0.0050	mg/L		18-OCT-18	R4286768
Tungsten (W)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Uranium (U)-Total	0.00298		0.000050	mg/L		18-OCT-18	R4286768
Vanadium (V)-Total	0.00133		0.00050	mg/L		18-OCT-18	R4286768
Yttrium (Y)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		18-OCT-18	R4286768
Zirconium (Zr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-OCT-18	R4257962
Conductivity	45900		2.0	uS/cm		26-SEP-18	R4245590
Orthophosphate-Dissolved (as P)	0.0177		0.0010	mg/L		22-SEP-18	R4233408
Dissolved Organic Carbon	1.36		0.50	mg/L		25-SEP-18	R4245104
Silicate (as SiO2)	0.347		0.010	mg/L		03-OCT-18	R4258600
Total Kjeldahl Nitrogen	0.123		0.050	mg/L	28-SEP-18	01-OCT-18	R4254028
Total Organic Carbon	1.43		0.50	mg/L		25-SEP-18	R4245103
Total Dissolved Solids	34000		80	mg/L		25-SEP-18	R4247695
Mercury (Hg)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4241691
Phosphorus (P)-Total	0.0234		0.0040	mg/L		22-SEP-18	R4233751
Total Suspended Solids	<2.0		2.0	mg/L		24-SEP-18	R4239893
pH	7.97		0.10	pH		26-SEP-18	R4245590
Salinity	30.1		1.0	psu		29-SEP-18	
Diss. Mercury in Seawater by CVAFS							
Dissolved Mercury Filtration Location	LAB					25-SEP-18	R4239017
Mercury (Hg)-Dissolved	<0.000010		0.000010	mg/L	25-SEP-18	25-SEP-18	R4238273
L2168530-4 MWE-1D							
Sampled By: CLIENT on 17-SEP-18 @ 18:45							
Matrix: marine H2O							
Alkalinity Species by Titration							
Alkalinity Spec by Titration (Seawater)							
Alkalinity, Bicarbonate (as CaCO3)	113		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Carbonate (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Hydroxide (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Total (as CaCO3)	113		1.0	mg/L		26-SEP-18	R4245590
Anions by Ion Chromatography (seawater)							
Bromide by IC (seawater)							
Bromide (Br)	58.0		5.0	mg/L		25-SEP-18	R4243309
Chloride by IC (seawater)							
Chloride (Cl)	16800		50	mg/L		25-SEP-18	R4243309
Fluoride by IC (seawater)							
Fluoride (F)	<1.0		1.0	mg/L		25-SEP-18	R4243309
Nitrate in Seawater by IC							
Nitrate (as N)	<0.50		0.50	mg/L		25-SEP-18	R4243309
Nitrite in Seawater by IC							
Nitrite (as N)	<0.10		0.10	mg/L		25-SEP-18	R4243309

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-4 MWE-1D							
Sampled By: CLIENT on 17-SEP-18 @ 18:45							
Matrix: marine H2O							
Sulfate by IC (seawater)							
Sulfate (SO4)	2400		30	mg/L		25-SEP-18	R4243309
Dissolved ICPOES & HR-ICPMS in Seawater							
Diss. Metals in Seawater by HR-ICPMS							
Dissolved Metals Filtration Location	LAB					01-OCT-18	R4254272
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Antimony (Sb)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Arsenic (As)-Dissolved	<0.0020		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Barium (Ba)-Dissolved	0.0088		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Beryllium (Be)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Bismuth (Bi)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Boron (B)-Dissolved	4.09		0.10	mg/L	01-OCT-18	18-OCT-18	R4286768
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Calcium (Ca)-Dissolved	363		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Cesium (Cs)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Cobalt (Co)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Copper (Cu)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Gallium (Ga)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	01-OCT-18	18-OCT-18	R4286768
Lead (Pb)-Dissolved	<0.00030		0.00030	mg/L	01-OCT-18	18-OCT-18	R4286768
Lithium (Li)-Dissolved	0.205		0.020	mg/L	01-OCT-18	18-OCT-18	R4286768
Magnesium (Mg)-Dissolved	981		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Manganese (Mn)-Dissolved	0.00068		0.00020	mg/L	01-OCT-18	18-OCT-18	R4286768
Molybdenum (Mo)-Dissolved	0.0119		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Nickel (Ni)-Dissolved	0.00055		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Potassium (K)-Dissolved	334		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Rhenium (Re)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Rubidium (Rb)-Dissolved	0.108		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Selenium (Se)-Dissolved	0.0024		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Silicon (Si)-Dissolved	<1.0		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L	01-OCT-18	18-OCT-18	R4286768
Sodium (Na)-Dissolved	9130		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Strontium (Sr)-Dissolved	5.30		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Sulfur (S)-Dissolved	723		5.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Tellurium (Te)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thallium (Tl)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thorium (Th)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tin (Sn)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Titanium (Ti)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tungsten (W)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Uranium (U)-Dissolved	0.00302		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Vanadium (V)-Dissolved	0.00132		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Yttrium (Y)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Zinc (Zn)-Dissolved	<0.0030		0.0030	mg/L	01-OCT-18	18-OCT-18	R4286768
Zirconium (Zr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Total ICPOES & HR-ICPMS in Seawater							
Hardness							
Hardness (as CaCO3)	4950		4.8	mg/L		19-OCT-18	
Tot. Metals in Seawater by HR-ICPMS							
Aluminum (Al)-Total	0.0255		0.0050	mg/L		19-OCT-18	R4288587
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-4 MWE-1D							
Sampled By: CLIENT on 17-SEP-18 @ 18:45							
Matrix: marine H2O							
Tot. Metals in Seawater by HR-ICPMS							
Arsenic (As)-Total	<0.0020		0.0020	mg/L		18-OCT-18	R4286768
Barium (Ba)-Total	0.0098		0.0010	mg/L		18-OCT-18	R4286768
Beryllium (Be)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Boron (B)-Total	4.29		0.10	mg/L		18-OCT-18	R4286768
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Calcium (Ca)-Total	364		1.0	mg/L		18-OCT-18	R4286768
Cesium (Cs)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Chromium (Cr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Cobalt (Co)-Total	0.000058		0.000050	mg/L		18-OCT-18	R4286768
Copper (Cu)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Gallium (Ga)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Iron (Fe)-Total	0.041		0.010	mg/L		18-OCT-18	R4286768
Lead (Pb)-Total	<0.00030		0.00030	mg/L		18-OCT-18	R4286768
Lithium (Li)-Total	0.215		0.020	mg/L		18-OCT-18	R4286768
Magnesium (Mg)-Total	1040		1.0	mg/L		18-OCT-18	R4286768
Manganese (Mn)-Total	0.00138		0.00020	mg/L		18-OCT-18	R4286768
Molybdenum (Mo)-Total	0.0123		0.0020	mg/L		18-OCT-18	R4286768
Nickel (Ni)-Total	0.00056		0.00050	mg/L		18-OCT-18	R4286768
Phosphorus (P)-Total	<0.050		0.050	mg/L		18-OCT-18	R4286768
Potassium (K)-Total	346		1.0	mg/L		18-OCT-18	R4286768
Rhenium (Re)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Rubidium (Rb)-Total	0.112		0.0050	mg/L		18-OCT-18	R4286768
Selenium (Se)-Total	0.0024		0.0020	mg/L		18-OCT-18	R4286768
Silicon (Si)-Total	<1.0		1.0	mg/L		18-OCT-18	R4286768
Silver (Ag)-Total	<0.00010		0.00010	mg/L		18-OCT-18	R4286768
Sodium (Na)-Total	9340		1.0	mg/L		18-OCT-18	R4286768
Strontium (Sr)-Total	5.38		0.010	mg/L		18-OCT-18	R4286768
Sulfur (S)-Total	750		5.0	mg/L		18-OCT-18	R4286768
Tellurium (Te)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Thallium (Tl)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Thorium (Th)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Tin (Sn)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Titanium (Ti)-Total	<0.0050		0.0050	mg/L		18-OCT-18	R4286768
Tungsten (W)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Uranium (U)-Total	0.00309		0.000050	mg/L		18-OCT-18	R4286768
Vanadium (V)-Total	0.00126		0.00050	mg/L		18-OCT-18	R4286768
Yttrium (Y)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		18-OCT-18	R4286768
Zirconium (Zr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-OCT-18	R4257962
Conductivity	45900		2.0	uS/cm		26-SEP-18	R4245590
Orthophosphate-Dissolved (as P)	0.0175		0.0010	mg/L		22-SEP-18	R4233408
Dissolved Organic Carbon	1.38		0.50	mg/L		25-SEP-18	R4245104
Silicate (as SiO2)	0.343		0.010	mg/L		03-OCT-18	R4258600
Total Kjeldahl Nitrogen	0.145		0.050	mg/L	28-SEP-18	01-OCT-18	R4254028
Total Organic Carbon	1.50		0.50	mg/L		25-SEP-18	R4245103
Total Dissolved Solids	34100		80	mg/L		25-SEP-18	R4247695
Mercury (Hg)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4241691

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-4 MWE-1D							
Sampled By: CLIENT on 17-SEP-18 @ 18:45							
Matrix: marine H2O							
Phosphorus (P)-Total	0.0246		0.0040	mg/L		22-SEP-18	R4233751
Total Suspended Solids	2.2		2.0	mg/L		24-SEP-18	R4239893
pH	7.98		0.10	pH		26-SEP-18	R4245590
Salinity	30.1		1.0	psu		29-SEP-18	
Diss. Mercury in Seawater by CVAFS							
Dissolved Mercury Filtration Location	LAB					25-SEP-18	R4239017
Mercury (Hg)-Dissolved	<0.000010		0.000010	mg/L	25-SEP-18	25-SEP-18	R4238273
L2168530-5 MWE-2S							
Sampled By: CLIENT on 17-SEP-18 @ 16:30							
Matrix: marine H2O							
Alkalinity Species by Titration							
Alkalinity Spec by Titration (Seawater)							
Alkalinity, Bicarbonate (as CaCO3)	112		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Carbonate (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Hydroxide (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Total (as CaCO3)	112		1.0	mg/L		26-SEP-18	R4245590
Anions by Ion Chromatography (seawater)							
Bromide by IC (seawater)							
Bromide (Br)	59.8		5.0	mg/L		25-SEP-18	R4243309
Chloride by IC (seawater)							
Chloride (Cl)	17400		50	mg/L		25-SEP-18	R4243309
Fluoride by IC (seawater)							
Fluoride (F)	<1.0		1.0	mg/L		25-SEP-18	R4243309
Nitrate in Seawater by IC							
Nitrate (as N)	<0.50		0.50	mg/L		25-SEP-18	R4243309
Nitrite in Seawater by IC							
Nitrite (as N)	<0.10		0.10	mg/L		25-SEP-18	R4243309
Sulfate by IC (seawater)							
Sulfate (SO4)	2470		30	mg/L		25-SEP-18	R4243309
Dissolved ICPOES & HR-ICPMS in Seawater							
Diss. Metals in Seawater by HR-ICPMS							
Dissolved Metals Filtration Location	LAB					01-OCT-18	R4254272
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Antimony (Sb)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Arsenic (As)-Dissolved	<0.0020		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Barium (Ba)-Dissolved	0.0098		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Beryllium (Be)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Bismuth (Bi)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Boron (B)-Dissolved	4.07		0.10	mg/L	01-OCT-18	18-OCT-18	R4286768
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Calcium (Ca)-Dissolved	361		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Cesium (Cs)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Cobalt (Co)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Copper (Cu)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Gallium (Ga)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	01-OCT-18	18-OCT-18	R4286768
Lead (Pb)-Dissolved	<0.00030		0.00030	mg/L	01-OCT-18	18-OCT-18	R4286768
Lithium (Li)-Dissolved	0.202		0.020	mg/L	01-OCT-18	18-OCT-18	R4286768
Magnesium (Mg)-Dissolved	1020		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Manganese (Mn)-Dissolved	0.00076		0.00020	mg/L	01-OCT-18	18-OCT-18	R4286768
Molybdenum (Mo)-Dissolved	0.0114		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-5 MWE-2S							
Sampled By: CLIENT on 17-SEP-18 @ 16:30							
Matrix: marine H2O							
Diss. Metals in Seawater by HR-ICPMS							
Nickel (Ni)-Dissolved	0.00057		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Potassium (K)-Dissolved	340		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Rhenium (Re)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Rubidium (Rb)-Dissolved	0.105		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Selenium (Se)-Dissolved	0.0024		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Silicon (Si)-Dissolved	<1.0		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L	01-OCT-18	18-OCT-18	R4286768
Sodium (Na)-Dissolved	9350		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Strontium (Sr)-Dissolved	5.39		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Sulfur (S)-Dissolved	744		5.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Tellurium (Te)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thallium (Tl)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thorium (Th)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tin (Sn)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Titanium (Ti)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tungsten (W)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Uranium (U)-Dissolved	0.00302		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Vanadium (V)-Dissolved	0.00113		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Yttrium (Y)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Zinc (Zn)-Dissolved	<0.0030		0.0030	mg/L	01-OCT-18	18-OCT-18	R4286768
Zirconium (Zr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Total ICPOES & HR-ICPMS in Seawater							
Hardness							
Hardness (as CaCO3)	5110		4.8	mg/L		18-OCT-18	
Tot. Metals in Seawater by HR-ICPMS							
Aluminum (Al)-Total	0.0235		0.0050	mg/L		18-OCT-18	R4286768
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Arsenic (As)-Total	<0.0020		0.0020	mg/L		18-OCT-18	R4286768
Barium (Ba)-Total	0.0093		0.0010	mg/L		18-OCT-18	R4286768
Beryllium (Be)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Boron (B)-Total	4.11		0.10	mg/L		18-OCT-18	R4286768
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Calcium (Ca)-Total	370		1.0	mg/L		18-OCT-18	R4286768
Cesium (Cs)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Chromium (Cr)-Total	0.00058		0.00050	mg/L		18-OCT-18	R4286768
Cobalt (Co)-Total	0.000051		0.000050	mg/L		18-OCT-18	R4286768
Copper (Cu)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Gallium (Ga)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Iron (Fe)-Total	0.037		0.010	mg/L		18-OCT-18	R4286768
Lead (Pb)-Total	<0.00030		0.00030	mg/L		18-OCT-18	R4286768
Lithium (Li)-Total	0.203		0.020	mg/L		18-OCT-18	R4286768
Magnesium (Mg)-Total	1020		1.0	mg/L		18-OCT-18	R4286768
Manganese (Mn)-Total	0.00132		0.00020	mg/L		18-OCT-18	R4286768
Molybdenum (Mo)-Total	0.0115		0.0020	mg/L		18-OCT-18	R4286768
Nickel (Ni)-Total	0.00055		0.00050	mg/L		18-OCT-18	R4286768
Phosphorus (P)-Total	<0.050		0.050	mg/L		18-OCT-18	R4286768
Potassium (K)-Total	351		1.0	mg/L		18-OCT-18	R4286768
Rhenium (Re)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Rubidium (Rb)-Total	0.106		0.0050	mg/L		18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-5 MWE-2S							
Sampled By: CLIENT on 17-SEP-18 @ 16:30							
Matrix: marine H2O							
Tot. Metals in Seawater by HR-ICPMS							
Selenium (Se)-Total	0.0024		0.0020	mg/L		18-OCT-18	R4286768
Silicon (Si)-Total	<1.0		1.0	mg/L		18-OCT-18	R4286768
Silver (Ag)-Total	<0.00010		0.00010	mg/L		18-OCT-18	R4286768
Sodium (Na)-Total	9740		1.0	mg/L		18-OCT-18	R4286768
Strontium (Sr)-Total	5.65		0.010	mg/L		18-OCT-18	R4286768
Sulfur (S)-Total	739		5.0	mg/L		18-OCT-18	R4286768
Tellurium (Te)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Thallium (Tl)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Thorium (Th)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Tin (Sn)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Titanium (Ti)-Total	0.0058		0.0050	mg/L		18-OCT-18	R4286768
Tungsten (W)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Uranium (U)-Total	0.00300		0.000050	mg/L		18-OCT-18	R4286768
Vanadium (V)-Total	0.00131		0.00050	mg/L		18-OCT-18	R4286768
Yttrium (Y)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		18-OCT-18	R4286768
Zirconium (Zr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-OCT-18	R4257962
Conductivity	46200		2.0	uS/cm		26-SEP-18	R4245590
Orthophosphate-Dissolved (as P)	0.0174		0.0010	mg/L		22-SEP-18	R4233408
Dissolved Organic Carbon	1.36		0.50	mg/L		02-OCT-18	R4257979
Silicate (as SiO2)	0.345		0.010	mg/L		03-OCT-18	R4258600
Total Kjeldahl Nitrogen	0.149		0.050	mg/L	28-SEP-18	01-OCT-18	R4254028
Total Organic Carbon	1.79		0.50	mg/L		25-SEP-18	R4245103
Total Dissolved Solids	35700		80	mg/L		25-SEP-18	R4247695
Mercury (Hg)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4241691
Phosphorus (P)-Total	0.0255		0.0040	mg/L		22-SEP-18	R4233751
Total Suspended Solids	2.6		2.0	mg/L		24-SEP-18	R4239893
pH	7.98		0.10	pH		26-SEP-18	R4245590
Salinity	30.3		1.0	psu		29-SEP-18	
Diss. Mercury in Seawater by CVAFS							
Dissolved Mercury Filtration Location	LAB					25-SEP-18	R4239017
Mercury (Hg)-Dissolved	<0.000010		0.000010	mg/L	25-SEP-18	25-SEP-18	R4238273
L2168530-6 MWE-2D							
Sampled By: CLIENT on 17-SEP-18 @ 16:30							
Matrix: marine H2O							
Alkalinity Species by Titration							
Alkalinity Spec by Titration (Seawater)							
Alkalinity, Bicarbonate (as CaCO3)	113		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Carbonate (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Hydroxide (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Total (as CaCO3)	113		1.0	mg/L		26-SEP-18	R4245590
Anions by Ion Chromatography (seawater)							
Bromide by IC (seawater)							
Bromide (Br)	58.9		5.0	mg/L		25-SEP-18	R4243309
Chloride by IC (seawater)							
Chloride (Cl)	17000		50	mg/L		25-SEP-18	R4243309
Fluoride by IC (seawater)							
Fluoride (F)	<1.0		1.0	mg/L		25-SEP-18	R4243309

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-6 MWE-2D							
Sampled By: CLIENT on 17-SEP-18 @ 16:30							
Matrix: marine H2O							
Nitrate in Seawater by IC							
Nitrate (as N)	<0.50		0.50	mg/L		25-SEP-18	R4243309
Nitrite in Seawater by IC							
Nitrite (as N)	<0.10		0.10	mg/L		25-SEP-18	R4243309
Sulfate by IC (seawater)							
Sulfate (SO4)	2430		30	mg/L		25-SEP-18	R4243309
Dissolved ICPOES & HR-ICPMS in Seawater							
Diss. Metals in Seawater by HR-ICPMS							
Dissolved Metals Filtration Location	LAB					01-OCT-18	R4254272
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Antimony (Sb)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Arsenic (As)-Dissolved	<0.0020		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Barium (Ba)-Dissolved	0.0088		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Beryllium (Be)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Bismuth (Bi)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Boron (B)-Dissolved	3.95		0.10	mg/L	01-OCT-18	18-OCT-18	R4286768
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Calcium (Ca)-Dissolved	354		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Cesium (Cs)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Cobalt (Co)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Copper (Cu)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Gallium (Ga)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	01-OCT-18	18-OCT-18	R4286768
Lead (Pb)-Dissolved	<0.00030		0.00030	mg/L	01-OCT-18	18-OCT-18	R4286768
Lithium (Li)-Dissolved	0.195		0.020	mg/L	01-OCT-18	18-OCT-18	R4286768
Magnesium (Mg)-Dissolved	993		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Manganese (Mn)-Dissolved	0.00068		0.00020	mg/L	01-OCT-18	18-OCT-18	R4286768
Molybdenum (Mo)-Dissolved	0.0113		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Potassium (K)-Dissolved	344		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Rhenium (Re)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Rubidium (Rb)-Dissolved	0.104		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Selenium (Se)-Dissolved	0.0023		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Silicon (Si)-Dissolved	<1.0		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L	01-OCT-18	18-OCT-18	R4286768
Sodium (Na)-Dissolved	9420		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Strontium (Sr)-Dissolved	5.27		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Sulfur (S)-Dissolved	720		5.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Tellurium (Te)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thallium (Tl)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thorium (Th)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tin (Sn)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Titanium (Ti)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tungsten (W)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Uranium (U)-Dissolved	0.00296		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Vanadium (V)-Dissolved	0.00122		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Yttrium (Y)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Zinc (Zn)-Dissolved	<0.0030		0.0030	mg/L	01-OCT-18	18-OCT-18	R4286768
Zirconium (Zr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Total ICPOES & HR-ICPMS in Seawater							
Hardness							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-6 MWE-2D							
Sampled By: CLIENT on 17-SEP-18 @ 16:30							
Matrix: marine H2O							
Hardness							
Hardness (as CaCO3)	4970		4.8	mg/L		18-OCT-18	
Tot. Metals in Seawater by HR-ICPMS							
Aluminum (Al)-Total	0.0232		0.0050	mg/L		18-OCT-18	R4286768
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Arsenic (As)-Total	<0.0020		0.0020	mg/L		18-OCT-18	R4286768
Barium (Ba)-Total	0.0090		0.0010	mg/L		18-OCT-18	R4286768
Beryllium (Be)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Boron (B)-Total	4.10		0.10	mg/L		18-OCT-18	R4286768
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Calcium (Ca)-Total	348		1.0	mg/L		18-OCT-18	R4286768
Cesium (Cs)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Chromium (Cr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Cobalt (Co)-Total	0.000050		0.000050	mg/L		18-OCT-18	R4286768
Copper (Cu)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Gallium (Ga)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Iron (Fe)-Total	0.029		0.010	mg/L		18-OCT-18	R4286768
Lead (Pb)-Total	<0.00030		0.00030	mg/L		18-OCT-18	R4286768
Lithium (Li)-Total	0.206		0.020	mg/L		18-OCT-18	R4286768
Magnesium (Mg)-Total	1030		1.0	mg/L		18-OCT-18	R4286768
Manganese (Mn)-Total	0.00119		0.00020	mg/L		18-OCT-18	R4286768
Molybdenum (Mo)-Total	0.0118		0.0020	mg/L		18-OCT-18	R4286768
Nickel (Ni)-Total	0.00063		0.00050	mg/L		18-OCT-18	R4286768
Phosphorus (P)-Total	<0.050		0.050	mg/L		18-OCT-18	R4286768
Potassium (K)-Total	334		1.0	mg/L		18-OCT-18	R4286768
Rhenium (Re)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Rubidium (Rb)-Total	0.109		0.0050	mg/L		18-OCT-18	R4286768
Selenium (Se)-Total	<0.0020		0.0020	mg/L		18-OCT-18	R4286768
Silicon (Si)-Total	<1.0		1.0	mg/L		18-OCT-18	R4286768
Silver (Ag)-Total	<0.00010		0.00010	mg/L		18-OCT-18	R4286768
Sodium (Na)-Total	9240		1.0	mg/L		18-OCT-18	R4286768
Strontium (Sr)-Total	5.38		0.010	mg/L		18-OCT-18	R4286768
Sulfur (S)-Total	757		5.0	mg/L		18-OCT-18	R4286768
Tellurium (Te)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Thallium (Tl)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Thorium (Th)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Tin (Sn)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Titanium (Ti)-Total	<0.0050		0.0050	mg/L		18-OCT-18	R4286768
Tungsten (W)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Uranium (U)-Total	0.00302		0.000050	mg/L		18-OCT-18	R4286768
Vanadium (V)-Total	0.00146		0.00050	mg/L		18-OCT-18	R4286768
Yttrium (Y)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		18-OCT-18	R4286768
Zirconium (Zr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-OCT-18	R4257962
Conductivity	45500		2.0	uS/cm		26-SEP-18	R4245590
Orthophosphate-Dissolved (as P)	0.0174		0.0010	mg/L		22-SEP-18	R4233408
Dissolved Organic Carbon	1.43		0.50	mg/L		25-SEP-18	R4245104
Silicate (as SiO2)	0.344		0.010	mg/L		03-OCT-18	R4258600
Total Kjeldahl Nitrogen	0.139		0.050	mg/L	28-SEP-18	01-OCT-18	R4254028

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-6 MWE-2D							
Sampled By: CLIENT on 17-SEP-18 @ 16:30							
Matrix: marine H2O							
Total Organic Carbon	1.54		0.50	mg/L		25-SEP-18	R4245103
Total Dissolved Solids	36000		80	mg/L		25-SEP-18	R4247695
Mercury (Hg)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4241691
Phosphorus (P)-Total	0.0247		0.0040	mg/L		22-SEP-18	R4233751
Total Suspended Solids	<2.0		2.0	mg/L		24-SEP-18	R4239893
pH	7.98		0.10	pH		26-SEP-18	R4245590
Salinity	29.8		1.0	psu		29-SEP-18	
Diss. Mercury in Seawater by CVAFS							
Dissolved Mercury Filtration Location	LAB					25-SEP-18	R4239017
Mercury (Hg)-Dissolved	<0.000010		0.000010	mg/L	25-SEP-18	25-SEP-18	R4238273
L2168530-7 MWREFA-2S							
Sampled By: CLIENT on 17-SEP-18 @ 17:45							
Matrix: marine H2O							
Alkalinity Species by Titration							
Alkalinity Spec by Titration (Seawater)							
Alkalinity, Bicarbonate (as CaCO3)	114		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Carbonate (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Hydroxide (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Total (as CaCO3)	114		1.0	mg/L		26-SEP-18	R4245590
Anions by Ion Chromatography (seawater)							
Bromide by IC (seawater)							
Bromide (Br)	54.5		5.0	mg/L		25-SEP-18	R4243309
Chloride by IC (seawater)							
Chloride (Cl)	16000		50	mg/L		25-SEP-18	R4243309
Fluoride by IC (seawater)							
Fluoride (F)	<1.0		1.0	mg/L		25-SEP-18	R4243309
Nitrate in Seawater by IC							
Nitrate (as N)	<0.50		0.50	mg/L		25-SEP-18	R4243309
Nitrite in Seawater by IC							
Nitrite (as N)	0.11		0.10	mg/L		25-SEP-18	R4243309
Sulfate by IC (seawater)							
Sulfate (SO4)	2260		30	mg/L		25-SEP-18	R4243309
Dissolved ICPOES & HR-ICPMS in Seawater							
Diss. Metals in Seawater by HR-ICPMS							
Dissolved Metals Filtration Location	LAB					01-OCT-18	R4254272
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Antimony (Sb)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Arsenic (As)-Dissolved	<0.0020		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Barium (Ba)-Dissolved	0.0088		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Beryllium (Be)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Bismuth (Bi)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Boron (B)-Dissolved	3.99		0.10	mg/L	01-OCT-18	18-OCT-18	R4286768
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Calcium (Ca)-Dissolved	341		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Cesium (Cs)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Cobalt (Co)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Copper (Cu)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Gallium (Ga)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	01-OCT-18	18-OCT-18	R4286768
Lead (Pb)-Dissolved	<0.00030		0.00030	mg/L	01-OCT-18	18-OCT-18	R4286768
Lithium (Li)-Dissolved	0.201		0.020	mg/L	01-OCT-18	18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-7 MWREFA-2S							
Sampled By: CLIENT on 17-SEP-18 @ 17:45							
Matrix: marine H2O							
Diss. Metals in Seawater by HR-ICPMS							
Magnesium (Mg)-Dissolved	1020		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Manganese (Mn)-Dissolved	0.00062		0.00020	mg/L	01-OCT-18	18-OCT-18	R4286768
Molybdenum (Mo)-Dissolved	0.0117		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Nickel (Ni)-Dissolved	0.00051		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Potassium (K)-Dissolved	331		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Rhenium (Re)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Rubidium (Rb)-Dissolved	0.106		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Selenium (Se)-Dissolved	0.0021		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Silicon (Si)-Dissolved	<1.0		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L	01-OCT-18	18-OCT-18	R4286768
Sodium (Na)-Dissolved	9060		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Strontium (Sr)-Dissolved	5.20		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Sulfur (S)-Dissolved	747		5.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Tellurium (Te)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thallium (Tl)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thorium (Th)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tin (Sn)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Titanium (Ti)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tungsten (W)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Uranium (U)-Dissolved	0.00291		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Vanadium (V)-Dissolved	0.00140		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Yttrium (Y)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Zinc (Zn)-Dissolved	<0.0030		0.0030	mg/L	01-OCT-18	18-OCT-18	R4286768
Zirconium (Zr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Total ICPOES & HR-ICPMS in Seawater							
Hardness							
Hardness (as CaCO3)	5030		4.8	mg/L		18-OCT-18	
Tot. Metals in Seawater by HR-ICPMS							
Aluminum (Al)-Total	0.0069		0.0050	mg/L		18-OCT-18	R4286768
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Arsenic (As)-Total	<0.0020		0.0020	mg/L		18-OCT-18	R4286768
Barium (Ba)-Total	0.0090		0.0010	mg/L		18-OCT-18	R4286768
Beryllium (Be)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Boron (B)-Total	4.26		0.10	mg/L		18-OCT-18	R4286768
Cadmium (Cd)-Total	0.000058		0.000050	mg/L		18-OCT-18	R4286768
Calcium (Ca)-Total	355		1.0	mg/L		18-OCT-18	R4286768
Cesium (Cs)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Chromium (Cr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Cobalt (Co)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Copper (Cu)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Gallium (Ga)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Iron (Fe)-Total	<0.010		0.010	mg/L		18-OCT-18	R4286768
Lead (Pb)-Total	<0.00030		0.00030	mg/L		18-OCT-18	R4286768
Lithium (Li)-Total	0.212		0.020	mg/L		18-OCT-18	R4286768
Magnesium (Mg)-Total	994		1.0	mg/L		18-OCT-18	R4286768
Manganese (Mn)-Total	0.00079		0.00020	mg/L		18-OCT-18	R4286768
Molybdenum (Mo)-Total	0.0121		0.0020	mg/L		18-OCT-18	R4286768
Nickel (Ni)-Total	0.00050		0.00050	mg/L		18-OCT-18	R4286768
Phosphorus (P)-Total	<0.050		0.050	mg/L		18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-7 MWREFA-2S							
Sampled By: CLIENT on 17-SEP-18 @ 17:45							
Matrix: marine H2O							
Tot. Metals in Seawater by HR-ICPMS							
Potassium (K)-Total	335		1.0	mg/L		18-OCT-18	R4286768
Rhenium (Re)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Rubidium (Rb)-Total	0.111		0.0050	mg/L		18-OCT-18	R4286768
Selenium (Se)-Total	0.0029		0.0020	mg/L		18-OCT-18	R4286768
Silicon (Si)-Total	<1.0		1.0	mg/L		18-OCT-18	R4286768
Silver (Ag)-Total	<0.00010		0.00010	mg/L		18-OCT-18	R4286768
Sodium (Na)-Total	9370		1.0	mg/L		18-OCT-18	R4286768
Strontium (Sr)-Total	5.43		0.010	mg/L		18-OCT-18	R4286768
Sulfur (S)-Total	727		5.0	mg/L		18-OCT-18	R4286768
Tellurium (Te)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Thallium (Tl)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Thorium (Th)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Tin (Sn)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Titanium (Ti)-Total	<0.0050		0.0050	mg/L		18-OCT-18	R4286768
Tungsten (W)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Uranium (U)-Total	0.00309		0.000050	mg/L		18-OCT-18	R4286768
Vanadium (V)-Total	0.00128		0.00050	mg/L		18-OCT-18	R4286768
Yttrium (Y)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		18-OCT-18	R4286768
Zirconium (Zr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-OCT-18	R4257962
Conductivity	45700		2.0	uS/cm		26-SEP-18	R4245590
Orthophosphate-Dissolved (as P)	0.0178		0.0010	mg/L		22-SEP-18	R4233408
Dissolved Organic Carbon	1.40		0.50	mg/L		25-SEP-18	R4245104
Silicate (as SiO2)	0.317		0.010	mg/L		03-OCT-18	R4258600
Total Kjeldahl Nitrogen	0.127		0.050	mg/L	28-SEP-18	01-OCT-18	R4254028
Total Organic Carbon	1.32		0.50	mg/L		25-SEP-18	R4245103
Total Dissolved Solids	33300		80	mg/L		25-SEP-18	R4247695
Mercury (Hg)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4241691
Phosphorus (P)-Total	0.0248		0.0040	mg/L		22-SEP-18	R4233751
Total Suspended Solids	<2.0		2.0	mg/L		24-SEP-18	R4239893
pH	7.97		0.10	pH		26-SEP-18	R4245590
Salinity	30.0		1.0	psu		29-SEP-18	
Diss. Mercury in Seawater by CVAFS							
Dissolved Mercury Filtration Location	LAB					25-SEP-18	R4239017
Mercury (Hg)-Dissolved	<0.000010		0.000010	mg/L	25-SEP-18	25-SEP-18	R4238273
L2168530-8 MWREFA-2D							
Sampled By: CLIENT on 17-SEP-18 @ 17:45							
Matrix: marine H2O							
Alkalinity Species by Titration							
Alkalinity Spec by Titration (Seawater)							
Alkalinity, Bicarbonate (as CaCO3)	113		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Carbonate (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Hydroxide (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Total (as CaCO3)	113		1.0	mg/L		26-SEP-18	R4245590
Anions by Ion Chromatography (seawater)							
Bromide by IC (seawater)							
Bromide (Br)	57.4		5.0	mg/L		25-SEP-18	R4243309
Chloride by IC (seawater)							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-8 MWREFA-2D							
Sampled By: CLIENT on 17-SEP-18 @ 17:45							
Matrix: marine H2O							
Chloride by IC (seawater)							
Chloride (Cl)	16900		50	mg/L		25-SEP-18	R4243309
Fluoride by IC (seawater)							
Fluoride (F)	<1.0		1.0	mg/L		25-SEP-18	R4243309
Nitrate in Seawater by IC							
Nitrate (as N)	<0.50		0.50	mg/L		25-SEP-18	R4243309
Nitrite in Seawater by IC							
Nitrite (as N)	<0.10		0.10	mg/L		25-SEP-18	R4243309
Sulfate by IC (seawater)							
Sulfate (SO4)	2400		30	mg/L		25-SEP-18	R4243309
Dissolved ICPOES & HR-ICPMS in Seawater							
Diss. Metals in Seawater by HR-ICPMS							
Dissolved Metals Filtration Location	LAB					01-OCT-18	R4254272
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Antimony (Sb)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Arsenic (As)-Dissolved	<0.0020		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Barium (Ba)-Dissolved	0.0091		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Beryllium (Be)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Bismuth (Bi)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Boron (B)-Dissolved	4.29		0.10	mg/L	01-OCT-18	18-OCT-18	R4286768
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Calcium (Ca)-Dissolved	350		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Cesium (Cs)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Cobalt (Co)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Copper (Cu)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Gallium (Ga)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	01-OCT-18	18-OCT-18	R4286768
Lead (Pb)-Dissolved	<0.00030		0.00030	mg/L	01-OCT-18	18-OCT-18	R4286768
Lithium (Li)-Dissolved	0.212		0.020	mg/L	01-OCT-18	18-OCT-18	R4286768
Magnesium (Mg)-Dissolved	993		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Manganese (Mn)-Dissolved	0.00065		0.00020	mg/L	01-OCT-18	18-OCT-18	R4286768
Molybdenum (Mo)-Dissolved	0.0122		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Nickel (Ni)-Dissolved	0.00053		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Potassium (K)-Dissolved	326		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Rhenium (Re)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Rubidium (Rb)-Dissolved	0.111		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Selenium (Se)-Dissolved	0.0024		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Silicon (Si)-Dissolved	<1.0		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L	01-OCT-18	18-OCT-18	R4286768
Sodium (Na)-Dissolved	9140		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Strontium (Sr)-Dissolved	5.27		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Sulfur (S)-Dissolved	730		5.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Tellurium (Te)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thallium (Tl)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thorium (Th)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tin (Sn)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Titanium (Ti)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tungsten (W)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Uranium (U)-Dissolved	0.00303		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Vanadium (V)-Dissolved	0.00122		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Yttrium (Y)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-8 MWREFA-2D							
Sampled By: CLIENT on 17-SEP-18 @ 17:45							
Matrix: marine H2O							
Diss. Metals in Seawater by HR-ICPMS							
Zinc (Zn)-Dissolved	<0.0030		0.0030	mg/L	01-OCT-18	18-OCT-18	R4286768
Zirconium (Zr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Total ICPOES & HR-ICPMS in Seawater							
Hardness							
Hardness (as CaCO3)	4960		4.8	mg/L		18-OCT-18	
Tot. Metals in Seawater by HR-ICPMS							
Aluminum (Al)-Total	0.0245		0.0050	mg/L		18-OCT-18	R4286768
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Arsenic (As)-Total	<0.0020		0.0020	mg/L		18-OCT-18	R4286768
Barium (Ba)-Total	0.0091		0.0010	mg/L		18-OCT-18	R4286768
Beryllium (Be)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Boron (B)-Total	4.06		0.10	mg/L		18-OCT-18	R4286768
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Calcium (Ca)-Total	351		1.0	mg/L		18-OCT-18	R4286768
Cesium (Cs)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Chromium (Cr)-Total	0.00068		0.00050	mg/L		18-OCT-18	R4286768
Cobalt (Co)-Total	0.000060		0.000050	mg/L		18-OCT-18	R4286768
Copper (Cu)-Total	0.00070		0.00050	mg/L		18-OCT-18	R4286768
Gallium (Ga)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Iron (Fe)-Total	0.035		0.010	mg/L		18-OCT-18	R4286768
Lead (Pb)-Total	<0.00030		0.00030	mg/L		18-OCT-18	R4286768
Lithium (Li)-Total	0.201		0.020	mg/L		18-OCT-18	R4286768
Magnesium (Mg)-Total	1010		1.0	mg/L		18-OCT-18	R4286768
Manganese (Mn)-Total	0.00120		0.00020	mg/L		18-OCT-18	R4286768
Molybdenum (Mo)-Total	0.0115		0.0020	mg/L		18-OCT-18	R4286768
Nickel (Ni)-Total	0.00061		0.00050	mg/L		18-OCT-18	R4286768
Phosphorus (P)-Total	<0.050		0.050	mg/L		18-OCT-18	R4286768
Potassium (K)-Total	328		1.0	mg/L		18-OCT-18	R4286768
Rhenium (Re)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Rubidium (Rb)-Total	0.107		0.0050	mg/L		18-OCT-18	R4286768
Selenium (Se)-Total	0.0022		0.0020	mg/L		18-OCT-18	R4286768
Silicon (Si)-Total	<1.0		1.0	mg/L		18-OCT-18	R4286768
Silver (Ag)-Total	<0.00010		0.00010	mg/L		18-OCT-18	R4286768
Sodium (Na)-Total	9080		1.0	mg/L		18-OCT-18	R4286768
Strontium (Sr)-Total	5.34		0.010	mg/L		18-OCT-18	R4286768
Sulfur (S)-Total	734		5.0	mg/L		18-OCT-18	R4286768
Tellurium (Te)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Thallium (Tl)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Thorium (Th)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Tin (Sn)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Titanium (Ti)-Total	0.0052		0.0050	mg/L		18-OCT-18	R4286768
Tungsten (W)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Uranium (U)-Total	0.00298		0.000050	mg/L		18-OCT-18	R4286768
Vanadium (V)-Total	0.00143		0.00050	mg/L		18-OCT-18	R4286768
Yttrium (Y)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		18-OCT-18	R4286768
Zirconium (Zr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-OCT-18	R4257962
Conductivity	45500		2.0	uS/cm		26-SEP-18	R4245590

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-8 MWREFA-2D							
Sampled By: CLIENT on 17-SEP-18 @ 17:45							
Matrix: marine H2O							
Orthophosphate-Dissolved (as P)	0.0169		0.0010	mg/L		22-SEP-18	R4233408
Dissolved Organic Carbon	1.42		0.50	mg/L		25-SEP-18	R4245104
Silicate (as SiO2)	0.316		0.010	mg/L		03-OCT-18	R4258600
Total Kjeldahl Nitrogen	0.139		0.050	mg/L	28-SEP-18	01-OCT-18	R4254028
Total Organic Carbon	1.39		0.50	mg/L		25-SEP-18	R4245103
Total Dissolved Solids	35200		80	mg/L		25-SEP-18	R4247695
Mercury (Hg)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4241691
Phosphorus (P)-Total	0.0299		0.0040	mg/L		22-SEP-18	R4233751
Total Suspended Solids	3.0		2.0	mg/L		24-SEP-18	R4239893
pH	7.98		0.10	pH		26-SEP-18	R4245590
Salinity	29.8		1.0	psu		29-SEP-18	
Diss. Mercury in Seawater by CVAFS							
Dissolved Mercury Filtration Location	LAB					25-SEP-18	R4239017
Mercury (Hg)-Dissolved	<0.000010		0.000010	mg/L	25-SEP-18	25-SEP-18	R4238273
L2168530-9 MWREFA-1S							
Sampled By: CLIENT on 17-SEP-18 @ 17:10							
Matrix: marine H2O							
Alkalinity Species by Titration							
Alkalinity Spec by Titration (Seawater)							
Alkalinity, Bicarbonate (as CaCO3)	114		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Carbonate (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Hydroxide (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Total (as CaCO3)	114		1.0	mg/L		26-SEP-18	R4245590
Anions by Ion Chromatography (seawater)							
Bromide by IC (seawater)							
Bromide (Br)	54.3		5.0	mg/L		25-SEP-18	R4243309
Chloride by IC (seawater)							
Chloride (Cl)	15900		50	mg/L		25-SEP-18	R4243309
Fluoride by IC (seawater)							
Fluoride (F)	<1.0		1.0	mg/L		25-SEP-18	R4243309
Nitrate in Seawater by IC							
Nitrate (as N)	<0.50		0.50	mg/L		25-SEP-18	R4243309
Nitrite in Seawater by IC							
Nitrite (as N)	<0.10		0.10	mg/L		25-SEP-18	R4243309
Sulfate by IC (seawater)							
Sulfate (SO4)	2260		30	mg/L		25-SEP-18	R4243309
Dissolved ICPOES & HR-ICPMS in Seawater							
Diss. Metals in Seawater by HR-ICPMS							
Dissolved Metals Filtration Location	LAB					01-OCT-18	R4254272
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Antimony (Sb)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Arsenic (As)-Dissolved	<0.0020		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Barium (Ba)-Dissolved	0.0091		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Beryllium (Be)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Bismuth (Bi)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Boron (B)-Dissolved	3.85		0.10	mg/L	01-OCT-18	18-OCT-18	R4286768
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Calcium (Ca)-Dissolved	362		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Cesium (Cs)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Cobalt (Co)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-9 MWREFA-1S							
Sampled By: CLIENT on 17-SEP-18 @ 17:10							
Matrix: marine H2O							
Diss. Metals in Seawater by HR-ICPMS							
Copper (Cu)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Gallium (Ga)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	01-OCT-18	18-OCT-18	R4286768
Lead (Pb)-Dissolved	<0.00030		0.00030	mg/L	01-OCT-18	18-OCT-18	R4286768
Lithium (Li)-Dissolved	0.196		0.020	mg/L	01-OCT-18	18-OCT-18	R4286768
Magnesium (Mg)-Dissolved	988		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Manganese (Mn)-Dissolved	0.00065		0.00020	mg/L	01-OCT-18	18-OCT-18	R4286768
Molybdenum (Mo)-Dissolved	0.0111		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Nickel (Ni)-Dissolved	0.00054		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Potassium (K)-Dissolved	338		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Rhenium (Re)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Rubidium (Rb)-Dissolved	0.103		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Selenium (Se)-Dissolved	<0.0020		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Silicon (Si)-Dissolved	<1.0		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L	01-OCT-18	18-OCT-18	R4286768
Sodium (Na)-Dissolved	9290		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Strontium (Sr)-Dissolved	5.24		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Sulfur (S)-Dissolved	721		5.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Tellurium (Te)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thallium (Tl)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thorium (Th)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tin (Sn)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Titanium (Ti)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tungsten (W)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Uranium (U)-Dissolved	0.00298		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Vanadium (V)-Dissolved	0.00131		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Yttrium (Y)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Zinc (Zn)-Dissolved	<0.0030		0.0030	mg/L	01-OCT-18	18-OCT-18	R4286768
Zirconium (Zr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Total ICPOES & HR-ICPMS in Seawater							
Hardness							
Hardness (as CaCO3)	4970		4.8	mg/L		18-OCT-18	
Tot. Metals in Seawater by HR-ICPMS							
Aluminum (Al)-Total	0.0234		0.0050	mg/L		18-OCT-18	R4286768
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Arsenic (As)-Total	<0.0020		0.0020	mg/L		18-OCT-18	R4286768
Barium (Ba)-Total	0.0099		0.0010	mg/L		18-OCT-18	R4286768
Beryllium (Be)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Boron (B)-Total	3.84		0.10	mg/L		18-OCT-18	R4286768
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Calcium (Ca)-Total	370		1.0	mg/L		18-OCT-18	R4286768
Cesium (Cs)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Chromium (Cr)-Total	0.00057		0.00050	mg/L		18-OCT-18	R4286768
Cobalt (Co)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Copper (Cu)-Total	0.00051		0.00050	mg/L		18-OCT-18	R4286768
Gallium (Ga)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Iron (Fe)-Total	0.030		0.010	mg/L		18-OCT-18	R4286768
Lead (Pb)-Total	<0.00030		0.00030	mg/L		18-OCT-18	R4286768
Lithium (Li)-Total	0.199		0.020	mg/L		18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-9 MWREFA-1S							
Sampled By: CLIENT on 17-SEP-18 @ 17:10							
Matrix: marine H2O							
Tot. Metals in Seawater by HR-ICPMS							
Magnesium (Mg)-Total	1040		1.0	mg/L		18-OCT-18	R4286768
Manganese (Mn)-Total	0.00122		0.00020	mg/L		18-OCT-18	R4286768
Molybdenum (Mo)-Total	0.0114		0.0020	mg/L		18-OCT-18	R4286768
Nickel (Ni)-Total	0.00068		0.00050	mg/L		18-OCT-18	R4286768
Phosphorus (P)-Total	<0.050		0.050	mg/L		18-OCT-18	R4286768
Potassium (K)-Total	343		1.0	mg/L		18-OCT-18	R4286768
Rhenium (Re)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Rubidium (Rb)-Total	0.106		0.0050	mg/L		18-OCT-18	R4286768
Selenium (Se)-Total	0.0025		0.0020	mg/L		18-OCT-18	R4286768
Silicon (Si)-Total	<1.0		1.0	mg/L		18-OCT-18	R4286768
Silver (Ag)-Total	<0.00010		0.00010	mg/L		18-OCT-18	R4286768
Sodium (Na)-Total	9580		1.0	mg/L		18-OCT-18	R4286768
Strontium (Sr)-Total	5.52		0.010	mg/L		18-OCT-18	R4286768
Sulfur (S)-Total	762		5.0	mg/L		18-OCT-18	R4286768
Tellurium (Te)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Thallium (Tl)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Thorium (Th)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Tin (Sn)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Titanium (Ti)-Total	<0.0050		0.0050	mg/L		18-OCT-18	R4286768
Tungsten (W)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Uranium (U)-Total	0.00306		0.000050	mg/L		18-OCT-18	R4286768
Vanadium (V)-Total	0.00146		0.00050	mg/L		18-OCT-18	R4286768
Yttrium (Y)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		18-OCT-18	R4286768
Zirconium (Zr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-OCT-18	R4257962
Conductivity	45400		2.0	uS/cm		26-SEP-18	R4245590
Orthophosphate-Dissolved (as P)	0.0167		0.0010	mg/L		22-SEP-18	R4233408
Dissolved Organic Carbon	1.40		0.50	mg/L		25-SEP-18	R4245104
Silicate (as SiO2)	0.313		0.010	mg/L		03-OCT-18	R4258600
Total Kjeldahl Nitrogen	0.127		0.050	mg/L	28-SEP-18	01-OCT-18	R4254028
Total Organic Carbon	1.25		0.50	mg/L		25-SEP-18	R4245103
Total Dissolved Solids	35200		80	mg/L		25-SEP-18	R4247695
Mercury (Hg)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4241691
Phosphorus (P)-Total	0.0233		0.0040	mg/L		22-SEP-18	R4233751
Total Suspended Solids	2.6		2.0	mg/L		24-SEP-18	R4239893
pH	7.98		0.10	pH		26-SEP-18	R4245590
Salinity	29.7		1.0	psu		29-SEP-18	
Diss. Mercury in Seawater by CVAFS							
Dissolved Mercury Filtration Location	LAB					25-SEP-18	R4239017
Mercury (Hg)-Dissolved	<0.000010		0.000010	mg/L	25-SEP-18	25-SEP-18	R4238273
L2168530-10 MWREFA-1D							
Sampled By: CLIENT on 17-SEP-18 @ 17:10							
Matrix: marine H2O							
Alkalinity Species by Titration							
Alkalinity Spec by Titration (Seawater)							
Alkalinity, Bicarbonate (as CaCO3)	113		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Carbonate (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Hydroxide (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-10 MWREFA-1D							
Sampled By: CLIENT on 17-SEP-18 @ 17:10							
Matrix: marine H2O							
Alkalinity Spec by Titration (Seawater)							
Alkalinity, Total (as CaCO3)	113		1.0	mg/L		26-SEP-18	R4245590
Anions by Ion Chromatography (seawater)							
Bromide by IC (seawater)							
Bromide (Br)	57.5		5.0	mg/L		25-SEP-18	R4243309
Chloride by IC (seawater)							
Chloride (Cl)	16800		50	mg/L		25-SEP-18	R4243309
Fluoride by IC (seawater)							
Fluoride (F)	<1.0		1.0	mg/L		25-SEP-18	R4243309
Nitrate in Seawater by IC							
Nitrate (as N)	<0.50		0.50	mg/L		25-SEP-18	R4243309
Nitrite in Seawater by IC							
Nitrite (as N)	<0.10		0.10	mg/L		25-SEP-18	R4243309
Sulfate by IC (seawater)							
Sulfate (SO4)	2350		30	mg/L		25-SEP-18	R4243309
Dissolved ICPOES & HR-ICPMS in Seawater							
Diss. Metals in Seawater by HR-ICPMS							
Dissolved Metals Filtration Location	LAB					01-OCT-18	R4254272
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Antimony (Sb)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Arsenic (As)-Dissolved	<0.0020		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Barium (Ba)-Dissolved	0.0084		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Beryllium (Be)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Bismuth (Bi)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Boron (B)-Dissolved	3.94		0.10	mg/L	01-OCT-18	18-OCT-18	R4286768
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Calcium (Ca)-Dissolved	357		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Cesium (Cs)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Cobalt (Co)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Copper (Cu)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Gallium (Ga)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	01-OCT-18	18-OCT-18	R4286768
Lead (Pb)-Dissolved	<0.00030		0.00030	mg/L	01-OCT-18	18-OCT-18	R4286768
Lithium (Li)-Dissolved	0.196		0.020	mg/L	01-OCT-18	18-OCT-18	R4286768
Magnesium (Mg)-Dissolved	986		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Manganese (Mn)-Dissolved	0.00076		0.00020	mg/L	01-OCT-18	18-OCT-18	R4286768
Molybdenum (Mo)-Dissolved	0.0114		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Nickel (Ni)-Dissolved	0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Potassium (K)-Dissolved	340		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Rhenium (Re)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Rubidium (Rb)-Dissolved	0.103		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Selenium (Se)-Dissolved	0.0023		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Silicon (Si)-Dissolved	<1.0		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L	01-OCT-18	18-OCT-18	R4286768
Sodium (Na)-Dissolved	9260		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Strontium (Sr)-Dissolved	5.17		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Sulfur (S)-Dissolved	716		5.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Tellurium (Te)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thallium (Tl)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thorium (Th)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tin (Sn)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-10 MWREFA-1D							
Sampled By: CLIENT on 17-SEP-18 @ 17:10							
Matrix: marine H2O							
Diss. Metals in Seawater by HR-ICPMS							
Titanium (Ti)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tungsten (W)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Uranium (U)-Dissolved	0.00290		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Vanadium (V)-Dissolved	0.00127		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Yttrium (Y)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Zinc (Zn)-Dissolved	<0.0030		0.0030	mg/L	01-OCT-18	18-OCT-18	R4286768
Zirconium (Zr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Total ICPOES & HR-ICPMS in Seawater							
Hardness							
Hardness (as CaCO3)	4950		4.8	mg/L		18-OCT-18	
Tot. Metals in Seawater by HR-ICPMS							
Aluminum (Al)-Total	0.0142		0.0050	mg/L		18-OCT-18	R4286768
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Arsenic (As)-Total	<0.0020		0.0020	mg/L		18-OCT-18	R4286768
Barium (Ba)-Total	0.0094		0.0010	mg/L		18-OCT-18	R4286768
Beryllium (Be)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Boron (B)-Total	4.17		0.10	mg/L		18-OCT-18	R4286768
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Calcium (Ca)-Total	356		1.0	mg/L		18-OCT-18	R4286768
Cesium (Cs)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Chromium (Cr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Cobalt (Co)-Total	0.000054		0.000050	mg/L		18-OCT-18	R4286768
Copper (Cu)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Gallium (Ga)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Iron (Fe)-Total	<0.010		0.010	mg/L		18-OCT-18	R4286768
Lead (Pb)-Total	<0.00030		0.00030	mg/L		18-OCT-18	R4286768
Lithium (Li)-Total	0.212		0.020	mg/L		18-OCT-18	R4286768
Magnesium (Mg)-Total	999		1.0	mg/L		18-OCT-18	R4286768
Manganese (Mn)-Total	0.00091		0.00020	mg/L		18-OCT-18	R4286768
Molybdenum (Mo)-Total	0.0118		0.0020	mg/L		18-OCT-18	R4286768
Nickel (Ni)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Phosphorus (P)-Total	<0.050		0.050	mg/L		18-OCT-18	R4286768
Potassium (K)-Total	339		1.0	mg/L		18-OCT-18	R4286768
Rhenium (Re)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Rubidium (Rb)-Total	0.110		0.0050	mg/L		18-OCT-18	R4286768
Selenium (Se)-Total	0.0021		0.0020	mg/L		18-OCT-18	R4286768
Silicon (Si)-Total	<1.0		1.0	mg/L		18-OCT-18	R4286768
Silver (Ag)-Total	<0.00010		0.00010	mg/L		18-OCT-18	R4286768
Sodium (Na)-Total	9310		1.0	mg/L		18-OCT-18	R4286768
Strontium (Sr)-Total	5.44		0.010	mg/L		18-OCT-18	R4286768
Sulfur (S)-Total	726		5.0	mg/L		18-OCT-18	R4286768
Tellurium (Te)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Thallium (Tl)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Thorium (Th)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Tin (Sn)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Titanium (Ti)-Total	<0.0050		0.0050	mg/L		18-OCT-18	R4286768
Tungsten (W)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Uranium (U)-Total	0.00309		0.000050	mg/L		18-OCT-18	R4286768
Vanadium (V)-Total	0.00140		0.00050	mg/L		18-OCT-18	R4286768
Yttrium (Y)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-10 MWREFA-1D							
Sampled By: CLIENT on 17-SEP-18 @ 17:10							
Matrix: marine H2O							
Tot. Metals in Seawater by HR-ICPMS							
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		18-OCT-18	R4286768
Zirconium (Zr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-OCT-18	R4257962
Conductivity	45500		2.0	uS/cm		26-SEP-18	R4245590
Orthophosphate-Dissolved (as P)	0.0175		0.0010	mg/L		22-SEP-18	R4233408
Dissolved Organic Carbon	1.39		0.50	mg/L		25-SEP-18	R4245104
Silicate (as SiO2)	0.322		0.010	mg/L		03-OCT-18	R4258600
Total Kjeldahl Nitrogen	0.141		0.050	mg/L	28-SEP-18	01-OCT-18	R4254028
Total Organic Carbon	1.24		0.50	mg/L		25-SEP-18	R4245103
Total Dissolved Solids	35500		80	mg/L		25-SEP-18	R4247695
Mercury (Hg)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4241691
Phosphorus (P)-Total	0.0247		0.0040	mg/L		22-SEP-18	R4233751
Total Suspended Solids	<2.0		2.0	mg/L		24-SEP-18	R4239893
pH	7.98		0.10	pH		26-SEP-18	R4245590
Salinity	29.8		1.0	psu		29-SEP-18	
Diss. Mercury in Seawater by CVAFS							
Dissolved Mercury Filtration Location	LAB					25-SEP-18	R4239017
Mercury (Hg)-Dissolved	<0.000010		0.000010	mg/L	25-SEP-18	25-SEP-18	R4238273
L2168530-11 DUP A							
Sampled By: CLIENT on 17-SEP-18 @ 16:30							
Matrix: marine H2O							
Alkalinity Species by Titration							
Alkalinity Spec by Titration (Seawater)							
Alkalinity, Bicarbonate (as CaCO3)	114		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Carbonate (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Hydroxide (as CaCO3)	<1.0		1.0	mg/L		26-SEP-18	R4245590
Alkalinity, Total (as CaCO3)	114		1.0	mg/L		26-SEP-18	R4245590
Anions by Ion Chromatography (seawater)							
Bromide by IC (seawater)							
Bromide (Br)	57.3		5.0	mg/L		25-SEP-18	R4243309
Chloride by IC (seawater)							
Chloride (Cl)	16800		50	mg/L		25-SEP-18	R4243309
Fluoride by IC (seawater)							
Fluoride (F)	<1.0		1.0	mg/L		25-SEP-18	R4243309
Nitrate in Seawater by IC							
Nitrate (as N)	<0.50		0.50	mg/L		25-SEP-18	R4243309
Nitrite in Seawater by IC							
Nitrite (as N)	<0.10		0.10	mg/L		25-SEP-18	R4243309
Sulfate by IC (seawater)							
Sulfate (SO4)	2390		30	mg/L		25-SEP-18	R4243309
Dissolved ICPOES & HR-ICPMS in Seawater							
Diss. Metals in Seawater by HR-ICPMS							
Dissolved Metals Filtration Location	LAB					01-OCT-18	R4254272
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Antimony (Sb)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Arsenic (As)-Dissolved	<0.0020		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Barium (Ba)-Dissolved	0.0092		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Beryllium (Be)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Bismuth (Bi)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-11 DUP A							
Sampled By: CLIENT on 17-SEP-18 @ 16:30							
Matrix: marine H2O							
Diss. Metals in Seawater by HR-ICPMS							
Boron (B)-Dissolved	4.09		0.10	mg/L	01-OCT-18	18-OCT-18	R4286768
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Calcium (Ca)-Dissolved	354		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Cesium (Cs)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Cobalt (Co)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Copper (Cu)-Dissolved	0.00065		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Gallium (Ga)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	01-OCT-18	18-OCT-18	R4286768
Lead (Pb)-Dissolved	<0.00030		0.00030	mg/L	01-OCT-18	18-OCT-18	R4286768
Lithium (Li)-Dissolved	0.206		0.020	mg/L	01-OCT-18	18-OCT-18	R4286768
Magnesium (Mg)-Dissolved	972		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Manganese (Mn)-Dissolved	0.00074		0.00020	mg/L	01-OCT-18	18-OCT-18	R4286768
Molybdenum (Mo)-Dissolved	0.0119		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Nickel (Ni)-Dissolved	0.00055		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Potassium (K)-Dissolved	333		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Rhenium (Re)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Rubidium (Rb)-Dissolved	0.106		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Selenium (Se)-Dissolved	0.0024		0.0020	mg/L	01-OCT-18	18-OCT-18	R4286768
Silicon (Si)-Dissolved	<1.0		1.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L	01-OCT-18	18-OCT-18	R4286768
Sodium (Na)-Dissolved	9330		20	mg/L	01-OCT-18	18-OCT-18	R4286768
Strontium (Sr)-Dissolved	5.25		0.050	mg/L	01-OCT-18	18-OCT-18	R4286768
Sulfur (S)-Dissolved	711		5.0	mg/L	01-OCT-18	18-OCT-18	R4286768
Tellurium (Te)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thallium (Tl)-Dissolved	<0.000050		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Thorium (Th)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tin (Sn)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Titanium (Ti)-Dissolved	<0.0050		0.0050	mg/L	01-OCT-18	18-OCT-18	R4286768
Tungsten (W)-Dissolved	<0.0010		0.0010	mg/L	01-OCT-18	18-OCT-18	R4286768
Uranium (U)-Dissolved	0.00307		0.000050	mg/L	01-OCT-18	18-OCT-18	R4286768
Vanadium (V)-Dissolved	0.00135		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Yttrium (Y)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Zinc (Zn)-Dissolved	<0.0030		0.0030	mg/L	01-OCT-18	18-OCT-18	R4286768
Zirconium (Zr)-Dissolved	<0.00050		0.00050	mg/L	01-OCT-18	18-OCT-18	R4286768
Total ICPOES & HR-ICPMS in Seawater							
Hardness							
Hardness (as CaCO3)	4890		4.8	mg/L		18-OCT-18	
Tot. Metals in Seawater by HR-ICPMS							
Aluminum (Al)-Total	0.0230		0.0050	mg/L		18-OCT-18	R4286768
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Arsenic (As)-Total	<0.0020		0.0020	mg/L		18-OCT-18	R4286768
Barium (Ba)-Total	0.0088		0.0010	mg/L		18-OCT-18	R4286768
Beryllium (Be)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Boron (B)-Total	4.00		0.10	mg/L		18-OCT-18	R4286768
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Calcium (Ca)-Total	363		1.0	mg/L		18-OCT-18	R4286768
Cesium (Cs)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Chromium (Cr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2168530-11 DUP A							
Sampled By: CLIENT on 17-SEP-18 @ 16:30							
Matrix: marine H2O							
Tot. Metals in Seawater by HR-ICPMS							
Cobalt (Co)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Copper (Cu)-Total	0.00101		0.00050	mg/L		18-OCT-18	R4286768
Gallium (Ga)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Iron (Fe)-Total	0.022		0.010	mg/L		18-OCT-18	R4286768
Lead (Pb)-Total	<0.00030		0.00030	mg/L		18-OCT-18	R4286768
Lithium (Li)-Total	0.206		0.020	mg/L		18-OCT-18	R4286768
Magnesium (Mg)-Total	1040		1.0	mg/L		18-OCT-18	R4286768
Manganese (Mn)-Total	0.00111		0.00020	mg/L		18-OCT-18	R4286768
Molybdenum (Mo)-Total	0.0117		0.0020	mg/L		18-OCT-18	R4286768
Nickel (Ni)-Total	0.00062		0.00050	mg/L		18-OCT-18	R4286768
Phosphorus (P)-Total	<0.050		0.050	mg/L		18-OCT-18	R4286768
Potassium (K)-Total	335		1.0	mg/L		18-OCT-18	R4286768
Rhenium (Re)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Rubidium (Rb)-Total	0.107		0.0050	mg/L		18-OCT-18	R4286768
Selenium (Se)-Total	0.0027		0.0020	mg/L		18-OCT-18	R4286768
Silicon (Si)-Total	<1.0		1.0	mg/L		18-OCT-18	R4286768
Silver (Ag)-Total	<0.00010		0.00010	mg/L		18-OCT-18	R4286768
Sodium (Na)-Total	9090		1.0	mg/L		18-OCT-18	R4286768
Strontium (Sr)-Total	5.44		0.010	mg/L		18-OCT-18	R4286768
Sulfur (S)-Total	761		5.0	mg/L		18-OCT-18	R4286768
Tellurium (Te)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Thallium (Tl)-Total	<0.000050		0.000050	mg/L		18-OCT-18	R4286768
Thorium (Th)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Tin (Sn)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Titanium (Ti)-Total	<0.0050		0.0050	mg/L		18-OCT-18	R4286768
Tungsten (W)-Total	<0.0010		0.0010	mg/L		18-OCT-18	R4286768
Uranium (U)-Total	0.00312		0.000050	mg/L		18-OCT-18	R4286768
Vanadium (V)-Total	0.00146		0.00050	mg/L		18-OCT-18	R4286768
Yttrium (Y)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		18-OCT-18	R4286768
Zirconium (Zr)-Total	<0.00050		0.00050	mg/L		18-OCT-18	R4286768
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-OCT-18	R4257962
Conductivity	45500		2.0	uS/cm		26-SEP-18	R4245590
Orthophosphate-Dissolved (as P)	0.0176		0.0010	mg/L		22-SEP-18	R4233408
Dissolved Organic Carbon	1.42		0.50	mg/L		25-SEP-18	R4245104
Silicate (as SiO2)	0.333		0.010	mg/L		03-OCT-18	R4258600
Total Kjeldahl Nitrogen	0.134		0.050	mg/L	28-SEP-18	01-OCT-18	R4254028
Total Organic Carbon	1.34		0.50	mg/L		25-SEP-18	R4245103
Total Dissolved Solids	33300		80	mg/L		25-SEP-18	R4247695
Mercury (Hg)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4241691
Phosphorus (P)-Total	0.0243		0.0040	mg/L		22-SEP-18	R4233751
Total Suspended Solids	3.8		2.0	mg/L		24-SEP-18	R4239893
pH	7.97		0.10	pH		26-SEP-18	R4245590
Salinity	29.8		1.0	psu		29-SEP-18	
Diss. Mercury in Seawater by CVAFS							
Dissolved Mercury Filtration Location	LAB					25-SEP-18	R4239017
Mercury (Hg)-Dissolved	<0.000010		0.000010	mg/L	25-SEP-18	25-SEP-18	R4238273

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TITR-VA	Seawater	Alkalinity Spec by Titration (Seawater)	APHA 2320 Alkalinity

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

ANIONS-C-BR-IC-VA	Seawater	Bromide by IC (seawater)	EPA 300.1 (mod)

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-C-CL-IC-VA	Seawater	Chloride by IC (seawater)	EPA 300.1 (mod)

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-C-F-IC-VA	Seawater	Fluoride by IC (seawater)	EPA 300.1 (mod)

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

ANIONS-C-NO2-IC-VA	Seawater	Nitrite in Seawater by IC	EPA 300.1 (mod)

This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.

ANIONS-C-NO3-IC-VA	Seawater	Nitrate in Seawater by IC	EPA 300.1 (mod)

This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.

ANIONS-C-SO4-IC-VA	Seawater	Sulfate by IC (seawater)	EPA 300.1 (mod)

This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".

CARBONS-C-DOC-VA	Seawater	DOC by combustion (seawater)	APHA 5310B TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.

CARBONS-C-TOC-VA	Seawater	TOC by combustion (seawater)	APHA 5310B TOTAL ORGANIC CARBON (TOC)

This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".

EC-C-PCT-VA	Seawater	Conductivity (Automated) (seawater)	APHA 2510 Auto. Conduc.

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

HARDNESS-CALC-VA	Seawater	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-DIS-C-CVAFS-VA	Seawater	Diss. Mercury in Seawater by CVAFS	PUGET SOUND PROTOCOLS, EPA 245.7

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified seawater sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

HG-TOT-C-CVAFS-VA	Seawater	Total Mercury in Seawater by CVAFS	PUGET SOUND PROTOCOLS, EPA 245.7

This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedure involves a cold-oxidation of the acidified seawater sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).

MET-D-L-HRMS-VA	Seawater	Diss. Metals in Seawater by HR-ICPMS	EPA 200.8

Trace metals in seawater are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) based on US EPA Method 200.8, (Revision 5.5). The procedures may involve laboratory sample filtration based on APHA Method 3030B.

MET-T-L-HRMS-VA	Seawater	Tot. Metals in Seawater by HR-ICPMS	EPA 200.8

Trace metals in seawater are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) based on US EPA Method 200.8, (Revision 5.5). The procedures may involve preliminary sample treatment by acid digestion based on APHA Method 3030E.

NH3-F-VA	Seawater	Ammonia in Seawater 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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
al.			
P-T-COL-VA	Seawater	Total P in Seawater by Colour	APHA 4500-P Phosphorus
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.			
PH-C-PCT-VA	Seawater	pH by Meter (Automated) (seawater)	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.			
PO4-DO-COL-VA	Seawater	D-Orthophosphate in Seawater by Colour	APHA 4500-P Phosphorus
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.			
SALINITY-CALC-VA	Seawater	Salinity by conductivity meter	APHA 2520B
Salinity is determined by the APHA 2520B Electrical Conductivity Method. Salinity is a unitless parameter that is roughly equivalent to grams per Litre. ALS applies the unit of psu (practical salinity unit) to indicate that salinity values are derived from the Practical Salinity Scale.			
SIO2-L-COL-VA	Seawater	Low Level Silicate by Colourimetric	APHA 4500-SiO2 E.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 E. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
TDS-VA	Seawater	Total Dissolved Solids by Gravimetric	APHA 2540 Gravimetric
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TKN-C-F-VA	Seawater	TKN in Seawater by Fluorescence	APHA 4500-NORG D.
This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection.			
TSS-C-VA	Seawater	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 (TSS) is determined by filtering a sample through a glass fibre filter. TSS is determined by drying the filter at 104 degrees celsius.			

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

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

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

Chain of Custody Numbers:

14-452765

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

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

Quality Control Report

Client: Agnico-Eagle - Meliadine Gold Project
PO Box 99
Rankin Inlet NU X0C 0G0
Contact: JENNIFER BROWN

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-VA	**Seawater**							
Batch R4245590								
WG2884434-3 CRM		**VA-ALK-TITR-CONTROL**						
Alkalinity, Total (as CaCO3)			101.1		%		85-115	26-SEP-18
WG2884434-6 DUP		**L2168530-5**						
Alkalinity, Total (as CaCO3)		112	110		mg/L	1.8	20	26-SEP-18
WG2884434-1 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	26-SEP-18
ANIONS-C-BR-IC-VA	**Seawater**							
Batch R4243309								
WG2884506-3 DUP		**L2168530-1**						
Bromide (Br)		55.5	57.6		mg/L	3.7	20	25-SEP-18
WG2884506-2 LCS								
Bromide (Br)			101.4		%		85-115	25-SEP-18
WG2884506-1 MB								
Bromide (Br)			<5.0		mg/L		5	25-SEP-18
ANIONS-C-CL-IC-VA	**Seawater**							
Batch R4243309								
WG2884506-3 DUP		**L2168530-1**						
Chloride (Cl)		16000	16600		mg/L	4.0	20	25-SEP-18
WG2884506-2 LCS								
Chloride (Cl)			99.95		%		90-110	25-SEP-18
WG2884506-1 MB								
Chloride (Cl)			<50		mg/L		50	25-SEP-18
ANIONS-C-F-IC-VA	**Seawater**							
Batch R4243309								
WG2884506-3 DUP		**L2168530-1**						
Fluoride (F)		<1.0	<1.0	RPD-NA	mg/L	N/A	20	25-SEP-18
WG2884506-2 LCS								
Fluoride (F)			99.97		%		90-110	25-SEP-18
WG2884506-1 MB								
Fluoride (F)			<1.0		mg/L		1	25-SEP-18
ANIONS-C-NO2-IC-VA	**Seawater**							
Batch R4243309								
WG2884506-3 DUP		**L2168530-1**						
Nitrite (as N)		<0.10	<0.10	RPD-NA	mg/L	N/A	20	25-SEP-18
WG2884506-2 LCS								
Nitrite (as N)			100.8		%		90-110	25-SEP-18
WG2884506-1 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ANIONS-C-NO2-IC-VA	**Seawater**							
Batch R4243309								
WG2884506-1 MB								
Nitrite (as N)			<0.10		mg/L		0.1	25-SEP-18
ANIONS-C-NO3-IC-VA	**Seawater**							
Batch R4243309								
WG2884506-3 DUP		**L2168530-1**						
Nitrate (as N)		<0.50	<0.50	RPD-NA	mg/L	N/A	20	25-SEP-18
WG2884506-2 LCS								
Nitrate (as N)			99.0		%		90-110	25-SEP-18
WG2884506-1 MB								
Nitrate (as N)			<0.50		mg/L		0.5	25-SEP-18
ANIONS-C-SO4-IC-VA	**Seawater**							
Batch R4243309								
WG2884506-3 DUP		**L2168530-1**						
Sulfate (SO4)		2280	2360		mg/L	3.7	20	25-SEP-18
WG2884506-2 LCS								
Sulfate (SO4)			100.5		%		90-110	25-SEP-18
WG2884506-1 MB								
Sulfate (SO4)			<30		mg/L		30	25-SEP-18
CARBONS-C-DOC-VA	**Seawater**							
Batch R4245104								
WG2886063-1 DUP		**L2168530-1**						
Dissolved Organic Carbon		1.43	1.48		mg/L	3.4	20	25-SEP-18
WG2886063-4 LCS								
Dissolved Organic Carbon			101.0		%		80-120	25-SEP-18
WG2886063-3 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	25-SEP-18
WG2886063-2 MS		**L2168530-2**						
Dissolved Organic Carbon			93.9		%		70-130	25-SEP-18
Batch R4257979								
WG2892697-4 LCS								
Dissolved Organic Carbon			96.8		%		80-120	02-OCT-18
WG2892697-3 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	02-OCT-18
CARBONS-C-TOC-VA	**Seawater**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CARBONS-C-TOC-VA	**Seawater**							
Batch R4245103								
WG2886062-1 DUP		**L2168530-1**						
Total Organic Carbon		1.46	1.39		mg/L	4.5	20	25-SEP-18
WG2886062-4 LCS								
Total Organic Carbon			102.2		%		80-120	25-SEP-18
WG2886062-3 MB								
Total Organic Carbon			<0.50		mg/L		0.5	25-SEP-18
WG2886062-2 MS		**L2168530-2**						
Total Organic Carbon			97.4		%		70-130	25-SEP-18
EC-C-PCT-VA	**Seawater**							
Batch R4245590								
WG2884434-4 CRM		**VA-EC-PCT-CONTROL**						
Conductivity			103.7		%		90-110	26-SEP-18
WG2884434-6 DUP		**L2168530-5**						
Conductivity		46200	45900		uS/cm	0.7	10	26-SEP-18
WG2884434-1 MB								
Conductivity			<2.0		uS/cm		2	26-SEP-18
HG-DIS-C-CVAFS-VA	**Seawater**							
Batch R4238273								
WG2885957-2 LCS								
Mercury (Hg)-Dissolved			100.3		%		80-120	25-SEP-18
WG2885957-1 MB		**LF**						
Mercury (Hg)-Dissolved			<0.000010		mg/L		0.00001	25-SEP-18
HG-TOT-C-CVAFS-VA	**Seawater**							
Batch R4241691								
WG2886918-2 LCS								
Mercury (Hg)-Total			99.4		%		80-120	26-SEP-18
WG2886918-1 MB								
Mercury (Hg)-Total			<0.000010		mg/L		0.00001	26-SEP-18
MET-D-L-HRMS-VA	**Seawater**							
Batch R4286768								
WG2891785-3 DUP		**L2168530-2**						
Aluminum (Al)-Dissolved		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	18-OCT-18
Antimony (Sb)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Arsenic (As)-Dissolved		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	18-OCT-18
Barium (Ba)-Dissolved		0.0099	0.0090		mg/L	9.4	20	18-OCT-18
Beryllium (Be)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Bismuth (Bi)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-L-HRMS-VA	**Seawater**							
Batch R4286768								
WG2891785-3 DUP		**L2168530-2**						
Boron (B)-Dissolved		4.11	3.98		mg/L	3.3	20	18-OCT-18
Cadmium (Cd)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	18-OCT-18
Calcium (Ca)-Dissolved		358	361		mg/L	0.8	20	18-OCT-18
Cesium (Cs)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Chromium (Cr)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Cobalt (Co)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	18-OCT-18
Copper (Cu)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Gallium (Ga)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Iron (Fe)-Dissolved		<0.010	<0.010	RPD-NA	mg/L	N/A	20	18-OCT-18
Lead (Pb)-Dissolved		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	18-OCT-18
Lithium (Li)-Dissolved		0.206	0.203		mg/L	1.7	20	18-OCT-18
Magnesium (Mg)-Dissolved		1040	1000		mg/L	4.0	20	18-OCT-18
Manganese (Mn)-Dissolved		0.00078	0.00073		mg/L	6.4	20	18-OCT-18
Molybdenum (Mo)-Dissolved		0.0120	0.0119		mg/L	0.8	20	18-OCT-18
Nickel (Ni)-Dissolved		0.00054	0.00058		mg/L	6.6	20	18-OCT-18
Phosphorus (P)-Dissolved		<0.050	<0.050	RPD-NA	mg/L	N/A	20	18-OCT-18
Potassium (K)-Dissolved		343	335		mg/L	2.4	20	18-OCT-18
Rhenium (Re)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Rubidium (Rb)-Dissolved		0.111	0.107		mg/L	3.9	20	18-OCT-18
Selenium (Se)-Dissolved		0.0033	0.0024	J	mg/L	0.0009	0.004	18-OCT-18
Silicon (Si)-Dissolved		<1.0	<1.0	RPD-NA	mg/L	N/A	20	18-OCT-18
Silver (Ag)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	18-OCT-18
Sodium (Na)-Dissolved		9380	9330		mg/L	0.5	20	18-OCT-18
Strontium (Sr)-Dissolved		5.43	5.25		mg/L	3.4	20	18-OCT-18
Sulfur (S)-Dissolved		770	731		mg/L	5.3	20	18-OCT-18
Tellurium (Te)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Thallium (Tl)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	18-OCT-18
Thorium (Th)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Tin (Sn)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	18-OCT-18
Titanium (Ti)-Dissolved		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	18-OCT-18
Tungsten (W)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	18-OCT-18
Uranium (U)-Dissolved		0.00310	0.00300		mg/L	3.2	20	18-OCT-18
Vanadium (V)-Dissolved		0.00129	0.00115		mg/L	11	20	18-OCT-18
Yttrium (Y)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-L-HRMS-VA	**Seawater**							
Batch R4286768								
WG2891785-3 DUP		**L2168530-2**						
Zinc (Zn)-Dissolved		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	18-OCT-18
Zirconium (Zr)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
WG2891785-4 MS		**L2168530-1**						
Aluminum (Al)-Dissolved			106.8		%		70-130	18-OCT-18
Antimony (Sb)-Dissolved			102.8		%		70-130	18-OCT-18
Arsenic (As)-Dissolved			95.2		%		70-130	18-OCT-18
Barium (Ba)-Dissolved			104.8		%		70-130	18-OCT-18
Beryllium (Be)-Dissolved			98.5		%		70-130	18-OCT-18
Bismuth (Bi)-Dissolved			97.9		%		70-130	18-OCT-18
Boron (B)-Dissolved			101.0		%		70-130	18-OCT-18
Cadmium (Cd)-Dissolved			91.0		%		70-130	18-OCT-18
Calcium (Ca)-Dissolved			N/A	MS-B	%		-	18-OCT-18
Cesium (Cs)-Dissolved			104.2		%		70-130	18-OCT-18
Chromium (Cr)-Dissolved			94.9		%		70-130	18-OCT-18
Cobalt (Co)-Dissolved			90.4		%		70-130	18-OCT-18
Copper (Cu)-Dissolved			85.7		%		70-130	18-OCT-18
Gallium (Ga)-Dissolved			91.4		%		70-130	18-OCT-18
Iron (Fe)-Dissolved			88.6		%		70-130	18-OCT-18
Lead (Pb)-Dissolved			89.7		%		70-130	18-OCT-18
Lithium (Li)-Dissolved			101.0		%		70-130	18-OCT-18
Magnesium (Mg)-Dissolved			N/A	MS-B	%		-	18-OCT-18
Manganese (Mn)-Dissolved			94.3		%		70-130	18-OCT-18
Molybdenum (Mo)-Dissolved			101.7		%		70-130	18-OCT-18
Nickel (Ni)-Dissolved			86.8		%		70-130	18-OCT-18
Phosphorus (P)-Dissolved			94.0		%		70-130	18-OCT-18
Potassium (K)-Dissolved			N/A	MS-B	%		-	18-OCT-18
Rhenium (Re)-Dissolved			100.2		%		70-130	18-OCT-18
Rubidium (Rb)-Dissolved			N/A	MS-B	%		-	18-OCT-18
Selenium (Se)-Dissolved			95.2		%		70-130	18-OCT-18
Silver (Ag)-Dissolved			93.8		%		70-130	18-OCT-18
Sodium (Na)-Dissolved			N/A	MS-B	%		-	18-OCT-18
Strontium (Sr)-Dissolved			N/A	MS-B	%		-	18-OCT-18
Tellurium (Te)-Dissolved			98.9		%		70-130	18-OCT-18
Thallium (Tl)-Dissolved			97.2		%		70-130	18-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-L-HRMS-VA	**Seawater**							
Batch R4286768								
WG2891785-4 MS		**L2168530-1**						
Thorium (Th)-Dissolved			95.0		%		70-130	18-OCT-18
Tin (Sn)-Dissolved			102.0		%		70-130	18-OCT-18
Titanium (Ti)-Dissolved			96.9		%		70-130	18-OCT-18
Tungsten (W)-Dissolved			101.5		%		70-130	18-OCT-18
Uranium (U)-Dissolved			100.9		%		70-130	18-OCT-18
Vanadium (V)-Dissolved			94.7		%		70-130	18-OCT-18
Yttrium (Y)-Dissolved			103.8		%		70-130	18-OCT-18
Zinc (Zn)-Dissolved			84.1		%		70-130	18-OCT-18
Zirconium (Zr)-Dissolved			108.0		%		70-130	18-OCT-18
Batch R4286967								
WG2891785-2 LCS								
Aluminum (Al)-Dissolved			89.6		%		80-120	15-OCT-18
Antimony (Sb)-Dissolved			89.1		%		80-120	15-OCT-18
Arsenic (As)-Dissolved			92.5		%		80-120	15-OCT-18
Barium (Ba)-Dissolved			98.4		%		80-120	15-OCT-18
Beryllium (Be)-Dissolved			93.6		%		80-120	15-OCT-18
Bismuth (Bi)-Dissolved			90.3		%		80-120	15-OCT-18
Boron (B)-Dissolved			106.7		%		80-120	15-OCT-18
Cadmium (Cd)-Dissolved			99.3		%		80-120	15-OCT-18
Calcium (Ca)-Dissolved			97.0		%		80-120	15-OCT-18
Cesium (Cs)-Dissolved			101.8		%		80-120	15-OCT-18
Chromium (Cr)-Dissolved			95.6		%		80-120	15-OCT-18
Cobalt (Co)-Dissolved			94.0		%		80-120	15-OCT-18
Copper (Cu)-Dissolved			92.8		%		80-120	15-OCT-18
Gallium (Ga)-Dissolved			94.8		%		80-120	15-OCT-18
Iron (Fe)-Dissolved			95.7		%		80-120	15-OCT-18
Lead (Pb)-Dissolved			105.6		%		80-120	15-OCT-18
Lithium (Li)-Dissolved			94.9		%		80-120	15-OCT-18
Magnesium (Mg)-Dissolved			98.6		%		80-120	15-OCT-18
Manganese (Mn)-Dissolved			105.2		%		80-120	15-OCT-18
Molybdenum (Mo)-Dissolved			103.2		%		80-120	15-OCT-18
Nickel (Ni)-Dissolved			95.0		%		80-120	15-OCT-18
Phosphorus (P)-Dissolved			101.3		%		80-120	15-OCT-18
Potassium (K)-Dissolved			94.5		%		80-120	15-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-L-HRMS-VA	**Seawater**							
Batch R4286967								
WG2891785-2 LCS								
Rhenium (Re)-Dissolved			102.0		%		80-120	15-OCT-18
Rubidium (Rb)-Dissolved			101.7		%		80-120	15-OCT-18
Selenium (Se)-Dissolved			102.6		%		80-120	15-OCT-18
Silicon (Si)-Dissolved			96.0		%		80-120	15-OCT-18
Silver (Ag)-Dissolved			97.5		%		80-120	15-OCT-18
Sodium (Na)-Dissolved			109.6		%		80-120	15-OCT-18
Strontium (Sr)-Dissolved			96.8		%		80-120	15-OCT-18
Sulfur (S)-Dissolved			102.8		%		80-120	15-OCT-18
Tellurium (Te)-Dissolved			102.0		%		80-120	15-OCT-18
Thallium (Tl)-Dissolved			94.3		%		80-120	15-OCT-18
Thorium (Th)-Dissolved			107.5		%		80-120	15-OCT-18
Tin (Sn)-Dissolved			102.6		%		80-120	15-OCT-18
Titanium (Ti)-Dissolved			95.6		%		80-120	15-OCT-18
Tungsten (W)-Dissolved			101.0		%		80-120	15-OCT-18
Uranium (U)-Dissolved			108.8		%		80-120	15-OCT-18
Vanadium (V)-Dissolved			95.2		%		80-120	15-OCT-18
Yttrium (Y)-Dissolved			107.0		%		80-120	15-OCT-18
Zinc (Zn)-Dissolved			96.4		%		80-120	15-OCT-18
Zirconium (Zr)-Dissolved			103.0		%		80-120	15-OCT-18
WG2891785-1 MB		**LF**						
Aluminum (Al)-Dissolved			<0.0050		mg/L		0.005	15-OCT-18
Antimony (Sb)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Arsenic (As)-Dissolved			<0.0020		mg/L		0.002	15-OCT-18
Barium (Ba)-Dissolved			<0.0010		mg/L		0.001	15-OCT-18
Beryllium (Be)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Bismuth (Bi)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Boron (B)-Dissolved			<0.10		mg/L		0.1	15-OCT-18
Cadmium (Cd)-Dissolved			<0.000050		mg/L		0.00005	15-OCT-18
Calcium (Ca)-Dissolved			<1.0		mg/L		1	15-OCT-18
Cesium (Cs)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Chromium (Cr)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Cobalt (Co)-Dissolved			<0.000050		mg/L		0.00005	15-OCT-18
Copper (Cu)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Gallium (Ga)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-L-HRMS-VA	**Seawater**							
Batch R4286967								
WG2891785-1 MB		**LF**						
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	15-OCT-18
Lead (Pb)-Dissolved			<0.00030		mg/L		0.0003	15-OCT-18
Lithium (Li)-Dissolved			<0.020		mg/L		0.02	15-OCT-18
Magnesium (Mg)-Dissolved			<1.0		mg/L		1	15-OCT-18
Manganese (Mn)-Dissolved			<0.00020		mg/L		0.0002	15-OCT-18
Molybdenum (Mo)-Dissolved			<0.0020		mg/L		0.002	15-OCT-18
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Phosphorus (P)-Dissolved			<0.050		mg/L		0.05	15-OCT-18
Potassium (K)-Dissolved			<1.0		mg/L		1	15-OCT-18
Rhenium (Re)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Rubidium (Rb)-Dissolved			<0.0050		mg/L		0.005	15-OCT-18
Selenium (Se)-Dissolved			<0.0020		mg/L		0.002	15-OCT-18
Silicon (Si)-Dissolved			<1.0		mg/L		1	15-OCT-18
Silver (Ag)-Dissolved			<0.00010		mg/L		0.0001	15-OCT-18
Strontium (Sr)-Dissolved			<0.010		mg/L		0.01	15-OCT-18
Sulfur (S)-Dissolved			<5.0		mg/L		5	15-OCT-18
Tellurium (Te)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Thallium (Tl)-Dissolved			<0.000050		mg/L		0.00005	15-OCT-18
Thorium (Th)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Tin (Sn)-Dissolved			<0.0010		mg/L		0.001	15-OCT-18
Titanium (Ti)-Dissolved			<0.0050		mg/L		0.005	15-OCT-18
Tungsten (W)-Dissolved			<0.0010		mg/L		0.001	15-OCT-18
Uranium (U)-Dissolved			<0.000050		mg/L		0.00005	15-OCT-18
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Yttrium (Y)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Zinc (Zn)-Dissolved			<0.0030		mg/L		0.003	15-OCT-18
Zirconium (Zr)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Batch R4288587								
WG2891785-1 MB		**LF**						
Sodium (Na)-Dissolved			<1.0		mg/L		1	19-OCT-18
MET-T-L-HRMS-VA	**Seawater**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-HRMS-VA	**Seawater**							
Batch R4263147								
WG2888262-1 MB								
Aluminum (Al)-Total			<0.0050		mg/L		0.005	04-OCT-18
Antimony (Sb)-Total			<0.00050		mg/L		0.0005	04-OCT-18
Arsenic (As)-Total			<0.0020		mg/L		0.002	04-OCT-18
Barium (Ba)-Total			<0.0010		mg/L		0.001	04-OCT-18
Beryllium (Be)-Total			<0.00050		mg/L		0.0005	04-OCT-18
Bismuth (Bi)-Total			<0.00050		mg/L		0.0005	04-OCT-18
Boron (B)-Total			<0.10		mg/L		0.1	04-OCT-18
Cadmium (Cd)-Total			<0.000050		mg/L		0.00005	04-OCT-18
Calcium (Ca)-Total			<1.0		mg/L		1	04-OCT-18
Cesium (Cs)-Total			<0.00050		mg/L		0.0005	04-OCT-18
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	04-OCT-18
Cobalt (Co)-Total			<0.000050		mg/L		0.00005	04-OCT-18
Copper (Cu)-Total			<0.00050		mg/L		0.0005	04-OCT-18
Gallium (Ga)-Total			<0.00050		mg/L		0.0005	04-OCT-18
Iron (Fe)-Total			<0.010		mg/L		0.01	04-OCT-18
Lead (Pb)-Total			<0.00030		mg/L		0.0003	04-OCT-18
Lithium (Li)-Total			<0.020		mg/L		0.02	04-OCT-18
Magnesium (Mg)-Total			<1.0		mg/L		1	04-OCT-18
Manganese (Mn)-Total			<0.00020		mg/L		0.0002	04-OCT-18
Molybdenum (Mo)-Total			<0.0020		mg/L		0.002	04-OCT-18
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	04-OCT-18
Phosphorus (P)-Total			<0.050		mg/L		0.05	04-OCT-18
Potassium (K)-Total			<1.0		mg/L		1	04-OCT-18
Rhenium (Re)-Total			<0.00050		mg/L		0.0005	04-OCT-18
Rubidium (Rb)-Total			<0.0050		mg/L		0.005	04-OCT-18
Selenium (Se)-Total			<0.0020		mg/L		0.002	04-OCT-18
Silicon (Si)-Total			<1.0		mg/L		1	04-OCT-18
Silver (Ag)-Total			<0.00010		mg/L		0.0001	04-OCT-18
Sodium (Na)-Total			<1.0		mg/L		1	04-OCT-18
Strontium (Sr)-Total			<0.010		mg/L		0.01	04-OCT-18
Sulfur (S)-Total			<5.0		mg/L		5	04-OCT-18
Tellurium (Te)-Total			<0.00050		mg/L		0.0005	04-OCT-18
Thallium (Tl)-Total			<0.000050		mg/L		0.00005	04-OCT-18
Thorium (Th)-Total			<0.00050		mg/L		0.0005	04-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-HRMS-VA	**Seawater**							
Batch R4263147								
WG2888262-1 MB								
Tin (Sn)-Total			<0.0010		mg/L		0.001	04-OCT-18
Titanium (Ti)-Total			<0.0050		mg/L		0.005	04-OCT-18
Tungsten (W)-Total			<0.0010		mg/L		0.001	04-OCT-18
Uranium (U)-Total			<0.000050		mg/L		0.00005	04-OCT-18
Vanadium (V)-Total			<0.00050		mg/L		0.0005	04-OCT-18
Yttrium (Y)-Total			<0.00050		mg/L		0.0005	04-OCT-18
Zinc (Zn)-Total			<0.0030		mg/L		0.003	04-OCT-18
Zirconium (Zr)-Total			<0.00050		mg/L		0.0005	04-OCT-18
Batch R4265391								
WG2888262-2 LCS								
Aluminum (Al)-Total			96.5		%		80-120	09-OCT-18
Antimony (Sb)-Total			100.0		%		80-120	09-OCT-18
Arsenic (As)-Total			103.0		%		80-120	09-OCT-18
Barium (Ba)-Total			93.4		%		80-120	09-OCT-18
Beryllium (Be)-Total			94.0		%		80-120	09-OCT-18
Bismuth (Bi)-Total			101.0		%		80-120	09-OCT-18
Boron (B)-Total			94.2		%		80-120	09-OCT-18
Cadmium (Cd)-Total			98.5		%		80-120	09-OCT-18
Calcium (Ca)-Total			89.7		%		80-120	09-OCT-18
Cesium (Cs)-Total			92.0		%		80-120	09-OCT-18
Chromium (Cr)-Total			111.0		%		80-120	09-OCT-18
Cobalt (Co)-Total			95.0		%		80-120	09-OCT-18
Copper (Cu)-Total			92.8		%		80-120	09-OCT-18
Gallium (Ga)-Total			98.0		%		80-120	09-OCT-18
Iron (Fe)-Total			116.5		%		80-120	09-OCT-18
Lead (Pb)-Total			109.0		%		80-120	09-OCT-18
Lithium (Li)-Total			88.8		%		80-120	09-OCT-18
Magnesium (Mg)-Total			98.0		%		80-120	09-OCT-18
Manganese (Mn)-Total			104.4		%		80-120	09-OCT-18
Molybdenum (Mo)-Total			90.4		%		80-120	09-OCT-18
Nickel (Ni)-Total			97.0		%		80-120	09-OCT-18
Phosphorus (P)-Total			99.5		%		80-120	09-OCT-18
Potassium (K)-Total			103.1		%		80-120	09-OCT-18
Rhenium (Re)-Total			98.0		%		80-120	09-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-HRMS-VA	**Seawater**							
Batch R4265391								
WG2888262-2 LCS								
Rubidium (Rb)-Total			95.0		%		80-120	09-OCT-18
Selenium (Se)-Total			96.5		%		80-120	09-OCT-18
Silicon (Si)-Total			112.0		%		80-120	09-OCT-18
Silver (Ag)-Total			93.5		%		80-120	09-OCT-18
Sodium (Na)-Total			107.4		%		80-120	09-OCT-18
Strontium (Sr)-Total			89.8		%		80-120	09-OCT-18
Sulfur (S)-Total			106.4		%		70-130	09-OCT-18
Tellurium (Te)-Total			100.5		%		80-120	09-OCT-18
Thallium (Tl)-Total			99.0		%		80-120	09-OCT-18
Thorium (Th)-Total			103.2		%		80-120	09-OCT-18
Tin (Sn)-Total			94.2		%		80-120	09-OCT-18
Titanium (Ti)-Total			96.8		%		80-120	09-OCT-18
Tungsten (W)-Total			99.5		%		80-120	09-OCT-18
Uranium (U)-Total			105.0		%		80-120	09-OCT-18
Vanadium (V)-Total			94.8		%		80-120	09-OCT-18
Yttrium (Y)-Total			97.5		%		80-120	09-OCT-18
Zinc (Zn)-Total			100.0		%		80-120	09-OCT-18
Zirconium (Zr)-Total			93.0		%		80-120	09-OCT-18
Batch R4273148								
WG2892233-2 LCS								
Aluminum (Al)-Total			89.2		%		80-120	10-OCT-18
Antimony (Sb)-Total			99.2		%		80-120	10-OCT-18
Arsenic (As)-Total			95.7		%		80-120	10-OCT-18
Barium (Ba)-Total			101.2		%		80-120	10-OCT-18
Beryllium (Be)-Total			93.3		%		80-120	10-OCT-18
Bismuth (Bi)-Total			102.9		%		80-120	10-OCT-18
Boron (B)-Total			108.0		%		80-120	10-OCT-18
Cadmium (Cd)-Total			102.0		%		80-120	10-OCT-18
Calcium (Ca)-Total			101.1		%		80-120	10-OCT-18
Cesium (Cs)-Total			103.8		%		80-120	10-OCT-18
Chromium (Cr)-Total			101.2		%		80-120	10-OCT-18
Cobalt (Co)-Total			94.8		%		80-120	10-OCT-18
Copper (Cu)-Total			92.8		%		80-120	10-OCT-18
Gallium (Ga)-Total			97.2		%		80-120	10-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-HRMS-VA	**Seawater**							
Batch R4273148								
WG2892233-2 LCS								
Iron (Fe)-Total			95.7		%		80-120	10-OCT-18
Lead (Pb)-Total			111.0		%		80-120	10-OCT-18
Lithium (Li)-Total			102.7		%		80-120	10-OCT-18
Magnesium (Mg)-Total			94.8		%		80-120	10-OCT-18
Manganese (Mn)-Total			104.4		%		80-120	10-OCT-18
Molybdenum (Mo)-Total			103.2		%		80-120	10-OCT-18
Nickel (Ni)-Total			91.8		%		80-120	10-OCT-18
Phosphorus (P)-Total			98.0		%		80-120	10-OCT-18
Potassium (K)-Total			94.2		%		80-120	10-OCT-18
Rhenium (Re)-Total			105.0		%		80-120	10-OCT-18
Rubidium (Rb)-Total			105.9		%		80-120	10-OCT-18
Selenium (Se)-Total			107.2		%		80-120	10-OCT-18
Silicon (Si)-Total			96.5		%		80-120	10-OCT-18
Silver (Ag)-Total			99.7		%		80-120	10-OCT-18
Sodium (Na)-Total			114.0		%		80-120	10-OCT-18
Strontium (Sr)-Total			98.4		%		80-120	10-OCT-18
Sulfur (S)-Total			102.3		%		70-130	10-OCT-18
Tellurium (Te)-Total			101.0		%		80-120	10-OCT-18
Thallium (Tl)-Total			98.3		%		80-120	10-OCT-18
Thorium (Th)-Total			113.6		%		80-120	10-OCT-18
Tin (Sn)-Total			112.2		%		80-120	10-OCT-18
Titanium (Ti)-Total			95.2		%		80-120	10-OCT-18
Tungsten (W)-Total			104.0		%		80-120	10-OCT-18
Uranium (U)-Total			109.8		%		80-120	10-OCT-18
Vanadium (V)-Total			96.2		%		80-120	10-OCT-18
Yttrium (Y)-Total			107.0		%		80-120	10-OCT-18
Zinc (Zn)-Total			93.2		%		80-120	10-OCT-18
Zirconium (Zr)-Total			103.0		%		80-120	10-OCT-18
WG2892233-1 MB								
Aluminum (Al)-Total			<0.0050		mg/L		0.005	10-OCT-18
Antimony (Sb)-Total			<0.00050		mg/L		0.0005	10-OCT-18
Arsenic (As)-Total			<0.0020		mg/L		0.002	10-OCT-18
Barium (Ba)-Total			<0.0010		mg/L		0.001	10-OCT-18
Beryllium (Be)-Total			<0.00050		mg/L		0.0005	10-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-HRMS-VA	**Seawater**							
Batch R4273148								
WG2892233-1 MB								
Bismuth (Bi)-Total			<0.00050		mg/L		0.0005	10-OCT-18
Boron (B)-Total			<0.10		mg/L		0.1	10-OCT-18
Cadmium (Cd)-Total			<0.000050		mg/L		0.00005	10-OCT-18
Calcium (Ca)-Total			<1.0		mg/L		1	10-OCT-18
Cesium (Cs)-Total			<0.00050		mg/L		0.0005	10-OCT-18
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	10-OCT-18
Cobalt (Co)-Total			<0.000050		mg/L		0.00005	10-OCT-18
Copper (Cu)-Total			<0.00050		mg/L		0.0005	10-OCT-18
Gallium (Ga)-Total			<0.00050		mg/L		0.0005	10-OCT-18
Iron (Fe)-Total			<0.010		mg/L		0.01	10-OCT-18
Lead (Pb)-Total			<0.00030		mg/L		0.0003	10-OCT-18
Lithium (Li)-Total			<0.020		mg/L		0.02	10-OCT-18
Magnesium (Mg)-Total			<1.0		mg/L		1	10-OCT-18
Manganese (Mn)-Total			<0.00020		mg/L		0.0002	10-OCT-18
Molybdenum (Mo)-Total			<0.0020		mg/L		0.002	10-OCT-18
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	10-OCT-18
Phosphorus (P)-Total			<0.050		mg/L		0.05	10-OCT-18
Potassium (K)-Total			<1.0		mg/L		1	10-OCT-18
Rhenium (Re)-Total			<0.00050		mg/L		0.0005	10-OCT-18
Rubidium (Rb)-Total			<0.0050		mg/L		0.005	10-OCT-18
Selenium (Se)-Total			<0.0020		mg/L		0.002	10-OCT-18
Silicon (Si)-Total			<1.0		mg/L		1	10-OCT-18
Silver (Ag)-Total			<0.00010		mg/L		0.0001	10-OCT-18
Sodium (Na)-Total			<1.0		mg/L		1	10-OCT-18
Strontium (Sr)-Total			<0.010		mg/L		0.01	10-OCT-18
Sulfur (S)-Total			<5.0		mg/L		5	10-OCT-18
Tellurium (Te)-Total			<0.00050		mg/L		0.0005	10-OCT-18
Thallium (Tl)-Total			<0.000050		mg/L		0.00005	10-OCT-18
Thorium (Th)-Total			<0.00050		mg/L		0.0005	10-OCT-18
Tin (Sn)-Total			<0.0010		mg/L		0.001	10-OCT-18
Titanium (Ti)-Total			<0.0050		mg/L		0.005	10-OCT-18
Tungsten (W)-Total			<0.0010		mg/L		0.001	10-OCT-18
Uranium (U)-Total			<0.000050		mg/L		0.00005	10-OCT-18
Vanadium (V)-Total			<0.00050		mg/L		0.0005	10-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-HRMS-VA	**Seawater**							
Batch R4273148								
WG2892233-1 MB								
Yttrium (Y)-Total			<0.00050		mg/L		0.0005	10-OCT-18
Zinc (Zn)-Total			<0.0030		mg/L		0.003	10-OCT-18
Zirconium (Zr)-Total			<0.00050		mg/L		0.0005	10-OCT-18
Batch R4286768								
WG2892233-3 DUP		**L2168530-4**						
Antimony (Sb)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Arsenic (As)-Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	18-OCT-18
Barium (Ba)-Total		0.0098	0.0090		mg/L	8.8	20	18-OCT-18
Beryllium (Be)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Bismuth (Bi)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Boron (B)-Total		4.29	3.99		mg/L	7.1	20	18-OCT-18
Cadmium (Cd)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	18-OCT-18
Calcium (Ca)-Total		364	355		mg/L	2.6	20	18-OCT-18
Cesium (Cs)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Chromium (Cr)-Total		<0.00050	0.00063	RPD-NA	mg/L	N/A	20	18-OCT-18
Cobalt (Co)-Total		0.000058	0.000055		mg/L	5.6	20	18-OCT-18
Copper (Cu)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Gallium (Ga)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Iron (Fe)-Total		0.041	0.052	J	mg/L	0.012	0.02	18-OCT-18
Lead (Pb)-Total		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	18-OCT-18
Lithium (Li)-Total		0.215	0.204		mg/L	5.4	20	18-OCT-18
Magnesium (Mg)-Total		1040	1140		mg/L	9.0	20	18-OCT-18
Manganese (Mn)-Total		0.00138	0.00159		mg/L	14	20	18-OCT-18
Molybdenum (Mo)-Total		0.0123	0.0119		mg/L	3.3	20	18-OCT-18
Nickel (Ni)-Total		0.00056	0.00082	J	mg/L	0.00026	0.001	18-OCT-18
Phosphorus (P)-Total		<0.050	<0.050	RPD-NA	mg/L	N/A	20	18-OCT-18
Potassium (K)-Total		346	338		mg/L	2.3	20	18-OCT-18
Rhenium (Re)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Rubidium (Rb)-Total		0.112	0.108		mg/L	3.8	20	18-OCT-18
Selenium (Se)-Total		0.0024	0.0023		mg/L	3.9	20	18-OCT-18
Silicon (Si)-Total		<1.0	<1.0	RPD-NA	mg/L	N/A	25	18-OCT-18
Silver (Ag)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	18-OCT-18
Sodium (Na)-Total		9340	9430		mg/L	1.0	20	18-OCT-18
Strontium (Sr)-Total		5.38	5.75		mg/L	6.7	20	18-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-HRMS-VA	**Seawater**							
Batch R4286768								
WG2892233-3 DUP		**L2168530-4**						
Sulfur (S)-Total		750	845		mg/L	12	25	18-OCT-18
Tellurium (Te)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Thallium (Tl)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	18-OCT-18
Thorium (Th)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Tin (Sn)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	18-OCT-18
Titanium (Ti)-Total		<0.0050	0.0059	RPD-NA	mg/L	N/A	20	18-OCT-18
Tungsten (W)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	18-OCT-18
Uranium (U)-Total		0.00309	0.00300		mg/L	2.9	20	18-OCT-18
Vanadium (V)-Total		0.00126	0.00165	J	mg/L	0.00039	0.001	18-OCT-18
Yttrium (Y)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
Zinc (Zn)-Total		<0.0030	0.0042	RPD-NA	mg/L	N/A	20	18-OCT-18
Zirconium (Zr)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	18-OCT-18
WG2892233-4 MS		**L2168530-1**						
Aluminum (Al)-Total			107.3		%		70-130	18-OCT-18
Antimony (Sb)-Total			100.7		%		70-130	18-OCT-18
Arsenic (As)-Total			93.7		%		70-130	18-OCT-18
Barium (Ba)-Total			104.9		%		70-130	18-OCT-18
Beryllium (Be)-Total			98.0		%		70-130	18-OCT-18
Bismuth (Bi)-Total			97.0		%		70-130	18-OCT-18
Boron (B)-Total			96.7		%		70-130	18-OCT-18
Cadmium (Cd)-Total			90.0		%		70-130	18-OCT-18
Calcium (Ca)-Total			N/A	MS-B	%		-	18-OCT-18
Cesium (Cs)-Total			104.1		%		70-130	18-OCT-18
Chromium (Cr)-Total			93.9		%		70-130	18-OCT-18
Cobalt (Co)-Total			92.6		%		70-130	18-OCT-18
Copper (Cu)-Total			86.5		%		70-130	18-OCT-18
Gallium (Ga)-Total			93.6		%		70-130	18-OCT-18
Iron (Fe)-Total			91.0		%		70-130	18-OCT-18
Lead (Pb)-Total			89.1		%		70-130	18-OCT-18
Lithium (Li)-Total			101.8		%		70-130	18-OCT-18
Magnesium (Mg)-Total			N/A	MS-B	%		-	18-OCT-18
Manganese (Mn)-Total			94.5		%		70-130	18-OCT-18
Molybdenum (Mo)-Total			101.3		%		70-130	18-OCT-18
Nickel (Ni)-Total			88.2		%		70-130	18-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-HRMS-VA	**Seawater**							
Batch R4286768								
WG2892233-4 MS		**L2168530-1**						
Phosphorus (P)-Total			93.7		%		70-130	18-OCT-18
Potassium (K)-Total			N/A	MS-B	%		-	18-OCT-18
Rhenium (Re)-Total			98.0		%		70-130	18-OCT-18
Rubidium (Rb)-Total			N/A	MS-B	%		-	18-OCT-18
Selenium (Se)-Total			93.0		%		70-130	18-OCT-18
Silver (Ag)-Total			92.2		%		70-130	18-OCT-18
Sodium (Na)-Total			N/A	MS-B	%		-	18-OCT-18
Strontium (Sr)-Total			N/A	MS-B	%		-	18-OCT-18
Tellurium (Te)-Total			97.1		%		70-130	18-OCT-18
Thallium (Tl)-Total			95.9		%		70-130	18-OCT-18
Thorium (Th)-Total			94.6		%		70-130	18-OCT-18
Tin (Sn)-Total			102.9		%		70-130	18-OCT-18
Titanium (Ti)-Total			96.5		%		70-130	18-OCT-18
Tungsten (W)-Total			97.8		%		70-130	18-OCT-18
Uranium (U)-Total			98.9		%		70-130	18-OCT-18
Vanadium (V)-Total			95.9		%		70-130	18-OCT-18
Yttrium (Y)-Total			102.9		%		70-130	18-OCT-18
Zinc (Zn)-Total			84.5		%		70-130	18-OCT-18
Zirconium (Zr)-Total			106.0		%		70-130	18-OCT-18
Batch R4288587								
WG2892233-3 DUP		**L2168530-4**						
Aluminum (Al)-Total		0.0255	0.0323	J	mg/L	0.0068	0.01	19-OCT-18
NH3-F-VA	**Seawater**							
Batch R4257962								
WG2892382-3 DUP		**L2168530-11**						
Ammonia, Total (as N)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	02-OCT-18
WG2892382-2 LCS								
Ammonia, Total (as N)			102.8		%		85-115	02-OCT-18
WG2892382-1 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	02-OCT-18
WG2892382-4 MS		**L2168530-11**						
Ammonia, Total (as N)			103.3		%		75-125	02-OCT-18
P-T-COL-VA	**Seawater**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-COL-VA	**Seawater**							
Batch R4233751								
WG2883866-2 CRM		**VA-ERA-PO4**						
Phosphorus (P)-Total			101.6		%		80-120	22-SEP-18
WG2883866-1 MB								
Phosphorus (P)-Total			<0.0040		mg/L		0.004	22-SEP-18
PH-C-PCT-VA	**Seawater**							
Batch R4245590								
WG2884434-2 CRM		**VA-PH7-BUF**						
pH			6.99		pH		6.9-7.1	26-SEP-18
WG2884434-6 DUP		**L2168530-5**						
pH		7.98	7.95	J	pH	0.03	0.3	26-SEP-18
PO4-DO-COL-VA	**Seawater**							
Batch R4233408								
WG2883819-2 CRM		**VA-OPO4-CONTROL**						
Orthophosphate-Dissolved (as P)			96.7		%		80-120	22-SEP-18
WG2883819-3 DUP		**L2168530-8**						
Orthophosphate-Dissolved (as P)		0.0169	0.0168		mg/L	0.2	20	22-SEP-18
WG2883819-1 MB								
Orthophosphate-Dissolved (as P)			<0.0010		mg/L		0.001	22-SEP-18
WG2883819-4 MS		**L2168530-9**						
Orthophosphate-Dissolved (as P)			101.2		%		70-130	22-SEP-18
SIO2-L-COL-VA	**Seawater**							
Batch R4258600								
WG2893982-2 CRM		**VA-SIO2-L-0.025**						
Silicate (as SiO2)			105.3		%		85-115	03-OCT-18
WG2893982-3 DUP		**L2168530-1**						
Silicate (as SiO2)		0.363	0.350		mg/L	3.8	20	03-OCT-18
WG2893982-1 MB								
Silicate (as SiO2)			<0.010		mg/L		0.01	03-OCT-18
TDS-VA	**Seawater**							
Batch R4247695								
WG2886803-3 DUP		**L2168530-1**						
Total Dissolved Solids		35400	36100		mg/L	1.8	20	25-SEP-18
WG2886803-2 LCS								
Total Dissolved Solids			104.7		%		85-115	25-SEP-18
WG2886803-1 MB								
Total Dissolved Solids			<10		mg/L		10	25-SEP-18
TKN-C-F-VA	**Seawater**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TKN-C-F-VA	**Seawater**							
Batch R4254028								
WG2889252-3 DUP		**L2168530-1**						
Total Kjeldahl Nitrogen		0.135	0.130		mg/L	3.7	20	01-OCT-18
WG2889252-2 LCS								
Total Kjeldahl Nitrogen			80.2		%		75-125	01-OCT-18
WG2889252-1 MB								
Total Kjeldahl Nitrogen			<0.050		mg/L		0.05	01-OCT-18
WG2889252-4 MS		**L2168530-2**						
Total Kjeldahl Nitrogen			118.4		%		70-130	01-OCT-18
TSS-C-VA	**Seawater**							
Batch R4239893								
WG2884830-6 LCS								
Total Suspended Solids			89.7		%		85-115	24-SEP-18
WG2884830-5 MB								
Total Suspended Solids			<2.0		mg/L		2	24-SEP-18

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Total Dissolved Solids by Gravimetric							
	1	17-SEP-18 18:15	25-SEP-18 23:59	7	8	days	EHT
	2	17-SEP-18 18:15	25-SEP-18 23:59	7	8	days	EHT
	3	17-SEP-18 18:45	25-SEP-18 23:59	7	8	days	EHT
	4	17-SEP-18 18:45	25-SEP-18 23:59	7	8	days	EHT
	5	17-SEP-18 16:30	25-SEP-18 23:59	7	8	days	EHT
	6	17-SEP-18 16:30	25-SEP-18 23:59	7	8	days	EHT
	7	17-SEP-18 17:45	25-SEP-18 23:59	7	8	days	EHT
	8	17-SEP-18 17:45	25-SEP-18 23:59	7	8	days	EHT
	9	17-SEP-18 17:10	25-SEP-18 23:59	7	8	days	EHT
	10	17-SEP-18 17:10	25-SEP-18 23:59	7	8	days	EHT
	11	17-SEP-18 16:30	25-SEP-18 23:59	7	8	days	EHT
pH by Meter (Automated) (seawater)							
	1	17-SEP-18 18:15	26-SEP-18 07:47	0.25	205	hours	EHTR-FM
	2	17-SEP-18 18:15	26-SEP-18 07:47	0.25	205	hours	EHTR-FM
	3	17-SEP-18 18:45	26-SEP-18 07:47	0.25	205	hours	EHTR-FM
	4	17-SEP-18 18:45	26-SEP-18 07:47	0.25	205	hours	EHTR-FM
	5	17-SEP-18 16:30	26-SEP-18 07:47	0.25	207	hours	EHTR-FM
	6	17-SEP-18 16:30	26-SEP-18 07:47	0.25	207	hours	EHTR-FM
	7	17-SEP-18 17:45	26-SEP-18 07:47	0.25	206	hours	EHTR-FM
	8	17-SEP-18 17:45	26-SEP-18 07:47	0.25	206	hours	EHTR-FM
	9	17-SEP-18 17:10	26-SEP-18 07:47	0.25	207	hours	EHTR-FM
	10	17-SEP-18 17:10	26-SEP-18 07:47	0.25	207	hours	EHTR-FM
	11	17-SEP-18 16:30	26-SEP-18 07:47	0.25	207	hours	EHTR-FM
Anions and Nutrients							
D-Orthophosphate in Seawater by Colour							
	1	17-SEP-18 18:15	22-SEP-18 06:59	3	5	days	EHTR
	2	17-SEP-18 18:15	22-SEP-18 06:59	3	5	days	EHTR
	3	17-SEP-18 18:45	22-SEP-18 06:59	3	5	days	EHTR
	4	17-SEP-18 18:45	22-SEP-18 07:01	3	5	days	EHTR
	5	17-SEP-18 16:30	22-SEP-18 07:03	3	5	days	EHTR
	6	17-SEP-18 16:30	22-SEP-18 07:03	3	5	days	EHTR
	7	17-SEP-18 17:45	22-SEP-18 07:03	3	5	days	EHTR
	8	17-SEP-18 17:45	22-SEP-18 07:04	3	5	days	EHTR
	9	17-SEP-18 17:10	22-SEP-18 07:04	3	5	days	EHTR
	10	17-SEP-18 17:10	22-SEP-18 07:06	3	5	days	EHTR
	11	17-SEP-18 16:30	22-SEP-18 07:06	3	5	days	EHTR
Nitrate in Seawater by IC							
	1	17-SEP-18 18:15	25-SEP-18 07:25	3	8	days	EHTR
	2	17-SEP-18 18:15	25-SEP-18 07:25	3	8	days	EHTR
	3	17-SEP-18 18:45	25-SEP-18 07:25	3	8	days	EHTR
	4	17-SEP-18 18:45	25-SEP-18 07:25	3	8	days	EHTR
	5	17-SEP-18 16:30	25-SEP-18 07:25	3	8	days	EHTR
	6	17-SEP-18 16:30	25-SEP-18 07:25	3	8	days	EHTR
	7	17-SEP-18 17:45	25-SEP-18 07:25	3	8	days	EHTR
	8	17-SEP-18 17:45	25-SEP-18 07:25	3	8	days	EHTR
	9	17-SEP-18 17:10	25-SEP-18 07:25	3	8	days	EHTR
	10	17-SEP-18 17:10	25-SEP-18 07:25	3	8	days	EHTR
	11	17-SEP-18 16:30	25-SEP-18 07:25	3	8	days	EHTR
Nitrite in Seawater by IC							
	1	17-SEP-18 18:15	25-SEP-18 07:25	3	8	days	EHTR
	2	17-SEP-18 18:15	25-SEP-18 07:25	3	8	days	EHTR
	3	17-SEP-18 18:45	25-SEP-18 07:25	3	8	days	EHTR
	4	17-SEP-18 18:45	25-SEP-18 07:25	3	8	days	EHTR
	5	17-SEP-18 16:30	25-SEP-18 07:25	3	8	days	EHTR
	6	17-SEP-18 16:30	25-SEP-18 07:25	3	8	days	EHTR
	7	17-SEP-18 17:45	25-SEP-18 07:25	3	8	days	EHTR

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Anions and Nutrients							
Nitrite in Seawater by IC							
	8	17-SEP-18 17:45	25-SEP-18 07:25	3	8	days	EHTR
	9	17-SEP-18 17:10	25-SEP-18 07:25	3	8	days	EHTR
	10	17-SEP-18 17:10	25-SEP-18 07:25	3	8	days	EHTR
	11	17-SEP-18 16:30	25-SEP-18 07:25	3	8	days	EHTR
Total P in Seawater by Colour							
	1	17-SEP-18 18:15	22-SEP-18 04:05	3	4	days	EHTR
	2	17-SEP-18 18:15	22-SEP-18 04:05	3	4	days	EHTR
	3	17-SEP-18 18:45	22-SEP-18 04:05	3	4	days	EHTR
	4	17-SEP-18 18:45	22-SEP-18 04:05	3	4	days	EHTR
	5	17-SEP-18 16:30	22-SEP-18 04:05	3	4	days	EHTR
	6	17-SEP-18 16:30	22-SEP-18 04:05	3	4	days	EHTR
	7	17-SEP-18 17:45	22-SEP-18 04:05	3	4	days	EHTR
	8	17-SEP-18 17:45	22-SEP-18 04:05	3	4	days	EHTR
	9	17-SEP-18 17:10	22-SEP-18 04:05	3	4	days	EHTR
	10	17-SEP-18 17:10	22-SEP-18 04:05	3	4	days	EHTR
	11	17-SEP-18 16:30	22-SEP-18 04:05	3	4	days	EHTR

Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2168530 were received on 21-SEP-18 08:35.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L2168530-COFC

COC Number: 14 - 452765

Page 1 of 1

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Agnico Eagle Mines	Select Report Format:	☑ PDF ☐ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3pm)
Contact:	Jennifer Brown	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐ Priority (2-4 business days if received by 3pm)
Address:	Meliadine, Rankin Inlet, NU X0C 0G0	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 business days if received by 3pm)
Phone:	1-819-759-7555 ext 4603996	Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency if received by 10am – contact ALS for surcharge.
		Email 1 or Fax	arman-dspan@golder.com	Specify Date Required for E2,E or P:
		Email 2	erichard@golder.com	

Invoice To	Same as Report To ☑ Yes ☐ No	Invoice Distribution	
	Copy of Invoice with Report ☑ Yes ☐ No	Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Company:	Agnico Eagle & Golder	Email 1 or Fax	invoices.meliadine@agnico.eagle.com
Contact:		Email 2	carolina-lesueigneurtorres@golder.com

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q69808	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		ALS Contact:	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	pH, Hardness, Alkalinity, Conductivity	DOC (lab filter)	Total Metals	Dissolved Metals	Nutrients	Salinity	Routine Parameters	Total & Diss. Hg	ASA (Benzothiazole)	TDC, TKN	TDS, TSS	Number of Containers
	WW1S	Sept 17 2018	18:15	marine H_2O	X	X	X	X	X	X	X	X	X	X	X	
	WW1D		18:15		X	X	X	X	X	X	X	X	X	X	X	
	MWE-1S		18:45		X	X	X	X	X	X	X	X	X	X	X	
	MWG-1D		18:45		X	X	X	X	X	X	X	X	X	X	X	
	MWE-2S		16:30		X	X	X	X	X	X	X	X	X	X	X	
	MWE-2D		16:30		X	X	X	X	X	X	X	X	X	X	X	
	MWReg A-2S		17:45		X	X	/	X	X	X	X	X	X	X	X	
	MWReg A-2D		17:45		X	X	X	X	X	X	X	X	X	X	X	
	MW Reg A-1S		17:10		X	X	X	X	X	X	X	X	X	X	X	
	MW Reg A-1D		17:10		X	X	X	X	X	X	X	X	X	X	X	
	DUP A		16:30		X	X	X	X	X	X	X	X	/	X	X	
				(X) for Final Analysis												

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	CCME criteria ; contact erichard@golder.com
Are samples for human drinking water use? ☐ Yes ☑ No	agnico_equis@golder.com
	report To: carolina_lesueigneurTorres@golder.com

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		
					10

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:
Andrew Rippington	Sept 18	07:30				JC	9/21/18	835AM

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-5396 v09 Front/03 October 2013

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.

White Paper Co. 604 951-3900

Appendix F-2. Water Quality QA/QC results

Sample ID			MWE-2D	DUP A	RPD (%)
Parameter	Detection Limit	Units	Seawater	Seawater	
Physical Tests (Seawater)					
Conductivity	2.0	uS/cm	45500	45500	0.0
Hardness (as CaCO3)	4.8	mg/L	4970	4890	1.6
pH	0.10	pH	7.98	7.97	0.1
Salinity	1.0	psu	29.8	29.8	0.0
Total Suspended Solids	2.0	mg/L	<2.0	3.8	<DL*5
Total Dissolved Solids	80	mg/L	36000	33300	7.8
Anions and Nutrients (Seawater)					
Alkalinity, Bicarbonate (as CaCO3)	1.0	mg/L	113	114	0.9
Alkalinity, Carbonate (as CaCO3)	1.0	mg/L	<1.0	<1.0	<DL*5
Alkalinity, Hydroxide (as CaCO3)	1.0	mg/L	<1.0	<1.0	<DL*5
Alkalinity, Total (as CaCO3)	1.0	mg/L	113	114	0.9
Ammonia, Total (as N)	0.0050	mg/L	<0.0050	<0.0050	<DL*5
Bromide (Br)	5.0	mg/L	58.9	57.3	2.8
Chloride (Cl)	50	mg/L	17000	16800	1.2
Fluoride (F)	1.0	mg/L	<1.0	<1.0	<DL*5
Nitrate (as N)	0.50	mg/L	<0.50	<0.50	<DL*5
Nitrite (as N)	0.10	mg/L	<0.10	<0.10	<DL*5
Total Kjeldahl Nitrogen	0.050	mg/L	0.139	0.134	<DL*5
Orthophosphate-Dissolved (as P)	0.0010	mg/L	0.0174	0.0176	1.1
Phosphorus (P)-Total	0.0040	mg/L	0.0247	0.0243	1.6
Silicate (as SiO2)	0.010	mg/L	0.344	0.333	3.2
Sulfate (SO4)	30	mg/L	2430	2390	1.7
Organic / Inorganic Carbon (Seawater)					
Dissolved Organic Carbon	0.50	mg/L	1.43	1.42	<DL*5
Total Organic Carbon	0.50	mg/L	1.54	1.34	<DL*5
Total Metals (Seawater)					
Aluminum (Al)-Total	0.0050	mg/L	0.0232	0.0230	<DL*5
Antimony (Sb)-Total	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Arsenic (As)-Total	0.0020	mg/L	<0.0020	<0.0020	<DL*5
Barium (Ba)-Total	0.0010	mg/L	0.0090	0.0088	2.2
Beryllium (Be)-Total	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Bismuth (Bi)-Total	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Boron (B)-Total	0.10	mg/L	4.10	4.00	2.5
Cadmium (Cd)-Total	0.000050	mg/L	<0.000050	<0.000050	<DL*5
Calcium (Ca)-Total	1.0	mg/L	348	363	4.2
Cesium (Cs)-Total	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Chromium (Cr)-Total	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Cobalt (Co)-Total	0.000050	mg/L	0.000050	<0.000050	<DL*5
Copper (Cu)-Total	0.00050	mg/L	<0.00050	0.00101	<DL*5
Gallium (Ga)-Total	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Iron (Fe)-Total	0.010	mg/L	0.029	0.022	<DL*5
Lead (Pb)-Total	0.00030	mg/L	<0.00030	<0.00030	<DL*5
Lithium (Li)-Total	0.020	mg/L	0.206	0.206	0.0
Magnesium (Mg)-Total	1.0	mg/L	1030	1040	1.0
Manganese (Mn)-Total	0.00020	mg/L	0.00119	0.00111	7.0
Mercury (Hg)-Total	0.000010	mg/L	<0.000010	<0.000010	<DL*5
Molybdenum (Mo)-Total	0.0020	mg/L	0.0118	0.0117	0.9
Nickel (Ni)-Total	0.00050	mg/L	0.00063	0.00062	<DL*5
Phosphorus (P)-Total	0.050	mg/L	<0.050	<0.050	<DL*5
Potassium (K)-Total	1.0	mg/L	334	335	0.3
Rhenium (Re)-Total	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Rubidium (Rb)-Total	0.0050	mg/L	0.109	0.107	1.9
Selenium (Se)-Total	0.0020	mg/L	<0.0020	0.0027	<DL*5
Silicon (Si)-Total	1.0	mg/L	<1.0	<1.0	<DL*5
Silver (Ag)-Total	0.00010	mg/L	<0.00010	<0.00010	<DL*5
Sodium (Na)-Total	1.0	mg/L	9240	9090	1.6
Strontium (Sr)-Total	0.010	mg/L	5.38	5.44	1.1
Sulfur (S)-Total	5.0	mg/L	757	761	0.5
Tellurium (Te)-Total	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Thallium (Tl)-Total	0.000050	mg/L	<0.000050	<0.000050	<DL*5
Thorium (Th)-Total	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Tin (Sn)-Total	0.0010	mg/L	<0.0010	<0.0010	<DL*5
Titanium (Ti)-Total	0.0050	mg/L	<0.0050	<0.0050	<DL*5
Tungsten (W)-Total	0.0010	mg/L	<0.0010	<0.0010	<DL*5
Uranium (U)-Total	0.000050	mg/L	0.00302	0.00312	3.3
Vanadium (V)-Total	0.00050	mg/L	0.00146	0.00146	<DL*5
Yttrium (Y)-Total	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Zinc (Zn)-Total	0.0030	mg/L	<0.0030	<0.0030	<DL*5
Zirconium (Zr)-Total	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Dissolved Metals (Seawater)					
Aluminum (Al)-Dissolved	0.0050	mg/L	<0.0050	<0.0050	<DL*5
Antimony (Sb)-Dissolved	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Arsenic (As)-Dissolved	0.0020	mg/L	<0.0020	<0.0020	<DL*5
Barium (Ba)-Dissolved	0.0010	mg/L	0.0088	0.0092	4.4
Beryllium (Be)-Dissolved	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Bismuth (Bi)-Dissolved	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Boron (B)-Dissolved	0.10	mg/L	3.95	4.09	3.5
Cadmium (Cd)-Dissolved	0.000050	mg/L	<0.000050	<0.000050	<DL*5
Calcium (Ca)-Dissolved	1.0	mg/L	354	354	0.0
Cesium (Cs)-Dissolved	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Chromium (Cr)-Dissolved	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Cobalt (Co)-Dissolved	0.000050	mg/L	<0.000050	<0.000050	<DL*5
Copper (Cu)-Dissolved	0.00050	mg/L	<0.00050	0.00065	<DL*5
Gallium (Ga)-Dissolved	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Iron (Fe)-Dissolved	0.010	mg/L	<0.010	<0.010	<DL*5
Lead (Pb)-Dissolved	0.00030	mg/L	<0.00030	<0.00030	<DL*5
Lithium (Li)-Dissolved	0.020	mg/L	0.195	0.206	5.5
Magnesium (Mg)-Dissolved	1.0	mg/L	993	972	2.1

Appendix F-2. Water Quality QA/QC results

Sample ID			MWE-2D	DUP A	RPD (%)
Parameter	Detection Limit	Units	Seawater	Seawater	
Manganese (Mn)-Dissolved	0.00020	mg/L	0.00068	0.00074	<DL*5
Mercury (Hg)-Dissolved	0.000010	mg/L	<0.000010	<0.000010	<DL*5
Molybdenum (Mo)-Dissolved	0.0020	mg/L	0.0113	0.0119	5.2
Nickel (Ni)-Dissolved	0.00050	mg/L	<0.00050	0.00055	<DL*5
Phosphorus (P)-Dissolved	0.050	mg/L	<0.050	<0.050	<DL*5
Potassium (K)-Dissolved	20	mg/L	344	333	3.2
Rhenium (Re)-Dissolved	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Rubidium (Rb)-Dissolved	0.0050	mg/L	0.104	0.106	1.9
Selenium (Se)-Dissolved	0.0020	mg/L	0.0023	0.0024	<DL*5
Silicon (Si)-Dissolved	1.0	mg/L	<1.0	<1.0	<DL*5
Silver (Ag)-Dissolved	0.00010	mg/L	<0.00010	<0.00010	<DL*5
Sodium (Na)-Dissolved	20	mg/L	9420	9330	1.0
Strontium (Sr)-Dissolved	0.050	mg/L	5.27	5.25	0.4
Sulfur (S)-Dissolved	5.0	mg/L	720	711	1.3
Tellurium (Te)-Dissolved	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Thallium (Tl)-Dissolved	0.000050	mg/L	<0.000050	<0.000050	<DL*5
Thorium (Th)-Dissolved	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Tin (Sn)-Dissolved	0.0010	mg/L	<0.0010	<0.0010	<DL*5
Titanium (Ti)-Dissolved	0.0050	mg/L	<0.0050	<0.0050	<DL*5
Tungsten (W)-Dissolved	0.0010	mg/L	<0.0010	<0.0010	<DL*5
Uranium (U)-Dissolved	0.000050	mg/L	0.00296	0.00307	3.6
Vanadium (V)-Dissolved	0.00050	mg/L	0.00122	0.00135	<DL*5
Yttrium (Y)-Dissolved	0.00050	mg/L	<0.00050	<0.00050	<DL*5
Zinc (Zn)-Dissolved	0.0030	mg/L	<0.0030	<0.0030	<DL*5
Zirconium (Zr)-Dissolved	0.00050	mg/L	<0.00050	<0.00050	<DL*5

Notes:
RPD - relative percent difference
<DL*5 - values are less than 5 times detection limit (DL)
Bold values - indicate RPDs greater than 20%

APPENDIX G

Marine Sediment and Water Quality Analytical Results

Agnico-Eagle - Meliadine Gold Project
ATTN: Jennifer Brown
PO Box 99
Rankin Inlet NU X0C 0G0

Date Received: 26-SEP-18
Report Date: 19-OCT-18 15:32 (MT)
Version: FINAL

Client Phone: 819-759-7555

Certificate of Analysis

Lab Work Order #: L2170896

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: 14-452766, 14-452767, 14-452768
Legal Site Desc:

Amber Springer, B.Sc
Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-1 MBE-1 REP 1							
Sampled By: CLIENT on 13-SEP-18 @ 17:00							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.83		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.64		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.100		0.050	%		11-OCT-18	R4271167
Total Organic Carbon Calculation							
Total Organic Carbon	0.541		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0108		0.0050	mg/kg	09-OCT-18	09-OCT-18	R4268284
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.065		0.020	%	10-OCT-18	17-OCT-18	R4283767
Metals in Soil by CRC ICPMS							
Aluminum (Al)	8080		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Antimony (Sb)	0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Arsenic (As)	6.34		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Barium (Ba)	49.8		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Beryllium (Be)	0.15		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Boron (B)	14.8		5.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Bismuth (Bi)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cadmium (Cd)	<0.020		0.020	mg/kg	09-OCT-18	10-OCT-18	R4268336
Calcium (Ca)	5710		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Chromium (Cr)	40.5		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cobalt (Co)	4.43		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Copper (Cu)	8.80		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Iron (Fe)	14400		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lead (Pb)	3.14		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lithium (Li)	11.0		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Magnesium (Mg)	7320		20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Manganese (Mn)	153		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Molybdenum (Mo)	0.55		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Nickel (Ni)	16.4		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Phosphorus (P)	924		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Potassium (K)	2230		100	mg/kg	09-OCT-18	10-OCT-18	R4268336
Selenium (Se)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Silver (Ag)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sodium (Na)	6090		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Strontium (Sr)	27.7		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sulfur (S)	<1000		1000	mg/kg	09-OCT-18	10-OCT-18	R4268336
Thallium (Tl)	0.085		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tin (Sn)	<1.0		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Titanium (Ti)	595		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tungsten (W)	<0.50		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Uranium (U)	0.700		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Vanadium (V)	32.7		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zinc (Zn)	25.8		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zirconium (Zr)	4.2		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
L2170896-2 MBE-1 REP 2							
Sampled By: CLIENT on 13-SEP-18 @ 17:00							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-2 MBE-1 REP 2							
Sampled By: CLIENT on 13-SEP-18 @ 17:00							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	1.16		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.80		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.139		0.050	%		11-OCT-18	R4271167
Total Organic Carbon Calculation							
Total Organic Carbon	0.661		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0114		0.0050	mg/kg	09-OCT-18	09-OCT-18	R4268284
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.069		0.020	%	10-OCT-18	17-OCT-18	R4283767
Metals in Soil by CRC ICPMS							
Aluminum (Al)	7800		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Antimony (Sb)	0.11		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Arsenic (As)	5.95		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Barium (Ba)	49.4		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Beryllium (Be)	0.16		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Boron (B)	16.1		5.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Bismuth (Bi)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cadmium (Cd)	<0.020		0.020	mg/kg	09-OCT-18	10-OCT-18	R4268336
Calcium (Ca)	6210		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Chromium (Cr)	39.9		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cobalt (Co)	4.47		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Copper (Cu)	9.23		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Iron (Fe)	14400		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lead (Pb)	3.65		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lithium (Li)	13.0		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Magnesium (Mg)	7260		20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Manganese (Mn)	151		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Molybdenum (Mo)	0.60		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Nickel (Ni)	16.1		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Phosphorus (P)	854		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Potassium (K)	2270		100	mg/kg	09-OCT-18	10-OCT-18	R4268336
Selenium (Se)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Silver (Ag)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sodium (Na)	6770		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Strontium (Sr)	30.5		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sulfur (S)	<1000		1000	mg/kg	09-OCT-18	10-OCT-18	R4268336
Thallium (Tl)	0.094		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tin (Sn)	<1.0		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Titanium (Ti)	595		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tungsten (W)	<0.50		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Uranium (U)	0.801		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Vanadium (V)	32.9		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zinc (Zn)	26.0		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zirconium (Zr)	4.8		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
L2170896-3 MBE-1 REP 3							
Sampled By: CLIENT on 13-SEP-18 @ 17:00							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-3 MBE-1 REP 3							
Sampled By: CLIENT on 13-SEP-18 @ 17:00							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.81		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.63		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.097		0.050	%		11-OCT-18	R4271167
Total Organic Carbon Calculation							
Total Organic Carbon	0.530		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0095		0.0050	mg/kg	09-OCT-18	09-OCT-18	R4268284
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.057		0.020	%	10-OCT-18	17-OCT-18	R4283767
Metals in Soil by CRC ICPMS							
Aluminum (Al)	7250		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Antimony (Sb)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Arsenic (As)	4.99		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Barium (Ba)	45.8		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Beryllium (Be)	0.15		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Boron (B)	14.3		5.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Bismuth (Bi)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cadmium (Cd)	<0.020		0.020	mg/kg	09-OCT-18	10-OCT-18	R4268336
Calcium (Ca)	5490		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Chromium (Cr)	57.0		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cobalt (Co)	4.40		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Copper (Cu)	9.08		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Iron (Fe)	13200		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lead (Pb)	3.10		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lithium (Li)	11.6		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Magnesium (Mg)	7010		20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Manganese (Mn)	146		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Molybdenum (Mo)	2.19		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Nickel (Ni)	26.3		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Phosphorus (P)	815		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Potassium (K)	2110		100	mg/kg	09-OCT-18	10-OCT-18	R4268336
Selenium (Se)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Silver (Ag)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sodium (Na)	6000		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Strontium (Sr)	25.4		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sulfur (S)	<1000		1000	mg/kg	09-OCT-18	10-OCT-18	R4268336
Thallium (Tl)	0.086		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tin (Sn)	<1.0		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Titanium (Ti)	559		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tungsten (W)	<0.50		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Uranium (U)	0.743		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Vanadium (V)	31.1		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zinc (Zn)	24.4		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zirconium (Zr)	4.2		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
L2170896-4 MBE-2 REP 1							
Sampled By: CLIENT on 13-SEP-18 @ 16:00							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-4 MBE-2 REP 1							
Sampled By: CLIENT on 13-SEP-18 @ 16:00							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.79		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.65		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.095		0.050	%		11-OCT-18	R4271167
Total Organic Carbon Calculation							
Total Organic Carbon	0.552		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0101		0.0050	mg/kg	09-OCT-18	09-OCT-18	R4268284
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.055		0.020	%	10-OCT-18	17-OCT-18	R4283767
Metals in Soil by CRC ICPMS							
Aluminum (Al)	6860		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Antimony (Sb)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Arsenic (As)	5.44		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Barium (Ba)	43.7		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Beryllium (Be)	0.14		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Boron (B)	13.5		5.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Bismuth (Bi)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cadmium (Cd)	<0.020		0.020	mg/kg	09-OCT-18	10-OCT-18	R4268336
Calcium (Ca)	5430		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Chromium (Cr)	36.3		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cobalt (Co)	4.05		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Copper (Cu)	7.91		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Iron (Fe)	13200		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lead (Pb)	3.21		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lithium (Li)	10.9		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Magnesium (Mg)	6560		20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Manganese (Mn)	137		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Molybdenum (Mo)	0.58		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Nickel (Ni)	15.0		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Phosphorus (P)	857		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Potassium (K)	2070		100	mg/kg	09-OCT-18	10-OCT-18	R4268336
Selenium (Se)	0.21		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Silver (Ag)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sodium (Na)	6210		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Strontium (Sr)	24.7		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sulfur (S)	<1000		1000	mg/kg	09-OCT-18	10-OCT-18	R4268336
Thallium (Tl)	0.083		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tin (Sn)	1.2		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Titanium (Ti)	510		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tungsten (W)	<0.50		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Uranium (U)	0.702		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Vanadium (V)	29.4		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zinc (Zn)	24.3		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zirconium (Zr)	3.9		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
L2170896-5 MBE-2 REP 2							
Sampled By: CLIENT on 13-SEP-18 @ 16:00							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-5 MBE-2 REP 2							
Sampled By: CLIENT on 13-SEP-18 @ 16:00							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.72		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.60		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.087		0.050	%		11-OCT-18	R4271167
Total Organic Carbon Calculation							
Total Organic Carbon	0.511		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0095		0.0050	mg/kg	09-OCT-18	09-OCT-18	R4268284
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.054		0.020	%	10-OCT-18	17-OCT-18	R4283767
Metals in Soil by CRC ICPMS							
Aluminum (Al)	7450		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Antimony (Sb)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Arsenic (As)	4.75		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Barium (Ba)	45.0		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Beryllium (Be)	0.15		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Boron (B)	13.4		5.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Bismuth (Bi)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cadmium (Cd)	<0.020		0.020	mg/kg	09-OCT-18	10-OCT-18	R4268336
Calcium (Ca)	5520		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Chromium (Cr)	38.8		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cobalt (Co)	4.25		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Copper (Cu)	8.06		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Iron (Fe)	13300		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lead (Pb)	3.10		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lithium (Li)	11.1		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Magnesium (Mg)	7010		20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Manganese (Mn)	146		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Molybdenum (Mo)	0.61		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Nickel (Ni)	15.2		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Phosphorus (P)	860		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Potassium (K)	2140		100	mg/kg	09-OCT-18	10-OCT-18	R4268336
Selenium (Se)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Silver (Ag)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sodium (Na)	6220		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Strontium (Sr)	24.3		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sulfur (S)	<1000		1000	mg/kg	09-OCT-18	10-OCT-18	R4268336
Thallium (Tl)	0.075		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tin (Sn)	<1.0		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Titanium (Ti)	608		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tungsten (W)	<0.50		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Uranium (U)	0.741		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Vanadium (V)	31.2		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zinc (Zn)	23.7		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zirconium (Zr)	5.2		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
L2170896-6 MBE-2 REP 3							
Sampled By: CLIENT on 13-SEP-18 @ 16:00							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-6 MBE-2 REP 3							
Sampled By: CLIENT on 13-SEP-18 @ 16:00							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.74		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.57		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.088		0.050	%		11-OCT-18	R4271167
Total Organic Carbon Calculation							
Total Organic Carbon	0.483		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0098		0.0050	mg/kg	09-OCT-18	09-OCT-18	R4268284
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.054		0.020	%	10-OCT-18	17-OCT-18	R4283767
Metals in Soil by CRC ICPMS							
Aluminum (Al)	6860		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Antimony (Sb)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Arsenic (As)	4.31		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Barium (Ba)	42.2		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Beryllium (Be)	0.15		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Boron (B)	13.5		5.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Bismuth (Bi)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cadmium (Cd)	<0.020		0.020	mg/kg	09-OCT-18	10-OCT-18	R4268336
Calcium (Ca)	6230		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Chromium (Cr)	35.3		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cobalt (Co)	3.88		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Copper (Cu)	7.53		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Iron (Fe)	12400		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lead (Pb)	3.13		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lithium (Li)	11.7		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Magnesium (Mg)	6220		20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Manganese (Mn)	135		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Molybdenum (Mo)	0.60		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Nickel (Ni)	14.1		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Phosphorus (P)	799		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Potassium (K)	1900		100	mg/kg	09-OCT-18	10-OCT-18	R4268336
Selenium (Se)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Silver (Ag)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sodium (Na)	6020		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Strontium (Sr)	28.2		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sulfur (S)	<1000		1000	mg/kg	09-OCT-18	10-OCT-18	R4268336
Thallium (Tl)	0.081		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tin (Sn)	<1.0		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Titanium (Ti)	533		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tungsten (W)	<0.50		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Uranium (U)	0.731		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Vanadium (V)	28.3		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zinc (Zn)	22.3		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zirconium (Zr)	4.5		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
L2170896-7 MBE-3 REP 1							
Sampled By: CLIENT on 13-SEP-18 @ 15:00							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-7 MBE-3 REP 1							
Sampled By: CLIENT on 13-SEP-18 @ 15:00							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.70		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.56		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.084		0.050	%		11-OCT-18	R4271167
Total Organic Carbon Calculation							
Total Organic Carbon	0.480		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0097		0.0050	mg/kg	09-OCT-18	09-OCT-18	R4268284
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.046		0.020	%	10-OCT-18	17-OCT-18	R4283767
Metals in Soil by CRC ICPMS							
Aluminum (Al)	6780		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Antimony (Sb)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Arsenic (As)	4.72		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Barium (Ba)	42.6		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Beryllium (Be)	0.15		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Boron (B)	13.4		5.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Bismuth (Bi)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cadmium (Cd)	<0.020		0.020	mg/kg	09-OCT-18	10-OCT-18	R4268336
Calcium (Ca)	5470		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Chromium (Cr)	35.9		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cobalt (Co)	3.97		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Copper (Cu)	7.51		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Iron (Fe)	12800		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lead (Pb)	2.95		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lithium (Li)	10.8		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Magnesium (Mg)	6500		20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Manganese (Mn)	135		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Molybdenum (Mo)	0.57		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Nickel (Ni)	14.1		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Phosphorus (P)	831		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Potassium (K)	1950		100	mg/kg	09-OCT-18	10-OCT-18	R4268336
Selenium (Se)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Silver (Ag)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sodium (Na)	5470		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Strontium (Sr)	24.3		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sulfur (S)	<1000		1000	mg/kg	09-OCT-18	10-OCT-18	R4268336
Thallium (Tl)	0.074		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tin (Sn)	<1.0		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Titanium (Ti)	554		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tungsten (W)	<0.50		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Uranium (U)	0.732		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Vanadium (V)	28.8		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zinc (Zn)	22.2		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zirconium (Zr)	4.6		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
L2170896-8 MBE-3 REP 2							
Sampled By: CLIENT on 13-SEP-18 @ 15:00							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-8 MBE-3 REP 2							
Sampled By: CLIENT on 13-SEP-18 @ 15:00							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.91		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.61		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.109		0.050	%		11-OCT-18	R4271167
Total Organic Carbon Calculation							
Total Organic Carbon	0.502		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0099		0.0050	mg/kg	09-OCT-18	18-OCT-18	R4268284
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.055		0.020	%	10-OCT-18	17-OCT-18	R4283767
Metals in Soil by CRC ICPMS							
Aluminum (Al)	7570		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Antimony (Sb)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Arsenic (As)	5.55		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Barium (Ba)	48.9		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Beryllium (Be)	0.15		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Boron (B)	14.1		5.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Bismuth (Bi)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cadmium (Cd)	<0.020		0.020	mg/kg	09-OCT-18	10-OCT-18	R4268336
Calcium (Ca)	7260		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Chromium (Cr)	40.6		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cobalt (Co)	4.43		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Copper (Cu)	8.43		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Iron (Fe)	13900		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lead (Pb)	3.18		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lithium (Li)	10.9		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Magnesium (Mg)	7150		20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Manganese (Mn)	152		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Molybdenum (Mo)	0.61		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Nickel (Ni)	16.4		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Phosphorus (P)	928		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Potassium (K)	2180		100	mg/kg	09-OCT-18	10-OCT-18	R4268336
Selenium (Se)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Silver (Ag)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sodium (Na)	6010		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Strontium (Sr)	32.3		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sulfur (S)	<1000		1000	mg/kg	09-OCT-18	10-OCT-18	R4268336
Thallium (Tl)	0.077		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tin (Sn)	<1.0		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Titanium (Ti)	623		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tungsten (W)	<0.50		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Uranium (U)	0.751		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Vanadium (V)	32.5		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zinc (Zn)	24.8		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zirconium (Zr)	4.5		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
L2170896-9 MBE-3 REP 3							
Sampled By: CLIENT on 13-SEP-18 @ 15:00							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-9 MBE-3 REP 3							
Sampled By: CLIENT on 13-SEP-18 @ 15:00							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.74		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.59		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.089		0.050	%		11-OCT-18	R4271167
Total Organic Carbon Calculation							
Total Organic Carbon	0.499		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0100		0.0050	mg/kg	09-OCT-18	09-OCT-18	R4268284
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.055		0.020	%	10-OCT-18	17-OCT-18	R4283767
Metals in Soil by CRC ICPMS							
Aluminum (Al)	7120		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Antimony (Sb)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Arsenic (As)	4.91		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Barium (Ba)	42.2		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Beryllium (Be)	0.15		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Boron (B)	14.2		5.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Bismuth (Bi)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cadmium (Cd)	<0.020		0.020	mg/kg	09-OCT-18	10-OCT-18	R4268336
Calcium (Ca)	5460		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Chromium (Cr)	35.7		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cobalt (Co)	3.96		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Copper (Cu)	7.49		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Iron (Fe)	12700		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lead (Pb)	3.12		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lithium (Li)	11.0		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Magnesium (Mg)	6260		20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Manganese (Mn)	135		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Molybdenum (Mo)	0.58		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Nickel (Ni)	14.6		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Phosphorus (P)	794		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Potassium (K)	2000		100	mg/kg	09-OCT-18	10-OCT-18	R4268336
Selenium (Se)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Silver (Ag)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sodium (Na)	5550		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Strontium (Sr)	25.8		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sulfur (S)	<1000		1000	mg/kg	09-OCT-18	10-OCT-18	R4268336
Thallium (Tl)	0.079		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tin (Sn)	<1.0		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Titanium (Ti)	549		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tungsten (W)	<0.50		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Uranium (U)	0.730		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Vanadium (V)	29.1		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zinc (Zn)	22.2		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zirconium (Zr)	4.6		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
L2170896-10 MBE-4 REP 1							
Sampled By: CLIENT on 13-SEP-18 @ 14:00							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-10 MBE-4 REP 1							
Sampled By: CLIENT on 13-SEP-18 @ 14:00							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.66		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.56		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.079		0.050	%		11-OCT-18	R4271167
Total Organic Carbon Calculation							
Total Organic Carbon	0.479		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0093		0.0050	mg/kg	09-OCT-18	09-OCT-18	R4268284
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.051		0.020	%	10-OCT-18	17-OCT-18	R4283767
Metals in Soil by CRC ICPMS							
Aluminum (Al)	6610		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Antimony (Sb)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Arsenic (As)	4.35		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Barium (Ba)	39.1		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Beryllium (Be)	0.14		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Boron (B)	12.7		5.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Bismuth (Bi)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cadmium (Cd)	<0.020		0.020	mg/kg	09-OCT-18	10-OCT-18	R4268336
Calcium (Ca)	5090		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Chromium (Cr)	33.2		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cobalt (Co)	3.72		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Copper (Cu)	6.99		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Iron (Fe)	11900		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lead (Pb)	2.78		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lithium (Li)	10.8		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Magnesium (Mg)	5940		20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Manganese (Mn)	127		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Molybdenum (Mo)	0.52		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Nickel (Ni)	13.6		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Phosphorus (P)	794		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Potassium (K)	1810		100	mg/kg	09-OCT-18	10-OCT-18	R4268336
Selenium (Se)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Silver (Ag)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sodium (Na)	5780		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Strontium (Sr)	23.2		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sulfur (S)	<1000		1000	mg/kg	09-OCT-18	10-OCT-18	R4268336
Thallium (Tl)	0.069		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tin (Sn)	<1.0		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Titanium (Ti)	502		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tungsten (W)	<0.50		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Uranium (U)	0.687		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Vanadium (V)	26.6		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zinc (Zn)	23.1		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zirconium (Zr)	3.9		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
L2170896-11 MBE-4 REP 2							
Sampled By: CLIENT on 13-SEP-18 @ 14:00							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-11 MBE-4 REP 2							
Sampled By: CLIENT on 13-SEP-18 @ 14:00							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.67		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.57		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.080		0.050	%		11-OCT-18	R4271167
Total Organic Carbon Calculation							
Total Organic Carbon	0.493		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0109		0.0050	mg/kg	09-OCT-18	09-OCT-18	R4268284
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.054		0.020	%	10-OCT-18	17-OCT-18	R4283767
Metals in Soil by CRC ICPMS							
Aluminum (Al)	6260		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Antimony (Sb)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Arsenic (As)	4.38		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Barium (Ba)	42.0		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Beryllium (Be)	0.15		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Boron (B)	14.2		5.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Bismuth (Bi)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cadmium (Cd)	<0.020		0.020	mg/kg	09-OCT-18	10-OCT-18	R4268336
Calcium (Ca)	5490		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Chromium (Cr)	33.5		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cobalt (Co)	3.72		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Copper (Cu)	7.29		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Iron (Fe)	11800		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lead (Pb)	3.11		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lithium (Li)	11.1		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Magnesium (Mg)	6300		20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Manganese (Mn)	124		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Molybdenum (Mo)	0.58		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Nickel (Ni)	14.2		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Phosphorus (P)	728		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Potassium (K)	1880		100	mg/kg	09-OCT-18	10-OCT-18	R4268336
Selenium (Se)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Silver (Ag)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sodium (Na)	6890		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Strontium (Sr)	24.8		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sulfur (S)	<1000		1000	mg/kg	09-OCT-18	10-OCT-18	R4268336
Thallium (Tl)	0.079		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tin (Sn)	<1.0		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Titanium (Ti)	476		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tungsten (W)	<0.50		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Uranium (U)	0.692		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Vanadium (V)	26.5		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zinc (Zn)	21.4		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zirconium (Zr)	4.0		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
L2170896-12 MBE-4 REP 3							
Sampled By: CLIENT on 13-SEP-18 @ 14:00							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-12 MBE-4 REP 3							
Sampled By: CLIENT on 13-SEP-18 @ 14:00							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.68		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.58		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.081		0.050	%		11-OCT-18	R4271167
Total Organic Carbon Calculation							
Total Organic Carbon	0.496		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0099		0.0050	mg/kg	09-OCT-18	09-OCT-18	R4268284
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.053		0.020	%	10-OCT-18	17-OCT-18	R4283767
Metals in Soil by CRC ICPMS							
Aluminum (Al)	6660		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Antimony (Sb)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Arsenic (As)	4.80		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Barium (Ba)	41.9		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Beryllium (Be)	0.13		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Boron (B)	13.0		5.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Bismuth (Bi)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cadmium (Cd)	<0.020		0.020	mg/kg	09-OCT-18	10-OCT-18	R4268336
Calcium (Ca)	4940		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Chromium (Cr)	35.3		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cobalt (Co)	3.84		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Copper (Cu)	7.94		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Iron (Fe)	12100		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lead (Pb)	3.28		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lithium (Li)	10.7		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Magnesium (Mg)	6290		20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Manganese (Mn)	129		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Molybdenum (Mo)	0.53		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Nickel (Ni)	14.5		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Phosphorus (P)	710		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Potassium (K)	1890		100	mg/kg	09-OCT-18	10-OCT-18	R4268336
Selenium (Se)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Silver (Ag)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sodium (Na)	6280		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Strontium (Sr)	22.8		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sulfur (S)	<1000		1000	mg/kg	09-OCT-18	10-OCT-18	R4268336
Thallium (Tl)	0.078		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tin (Sn)	<1.0		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Titanium (Ti)	487		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tungsten (W)	<0.50		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Uranium (U)	0.682		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Vanadium (V)	27.3		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zinc (Zn)	66.4		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zirconium (Zr)	3.8		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
L2170896-13 MBE-5 REP 1							
Sampled By: CLIENT on 13-SEP-18 @ 12:20							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-13 MBE-5 REP 1							
Sampled By: CLIENT on 13-SEP-18 @ 12:20							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.90		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.62		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.109		0.050	%		11-OCT-18	R4271167
Total Organic Carbon Calculation							
Total Organic Carbon	0.513		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0092		0.0050	mg/kg	09-OCT-18	09-OCT-18	R4268284
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.053		0.020	%	10-OCT-18	17-OCT-18	R4283767
Metals in Soil by CRC ICPMS							
Aluminum (Al)	7080		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Antimony (Sb)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Arsenic (As)	5.64		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Barium (Ba)	44.5		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Beryllium (Be)	0.14		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Boron (B)	13.9		5.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Bismuth (Bi)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cadmium (Cd)	<0.020		0.020	mg/kg	09-OCT-18	10-OCT-18	R4268336
Calcium (Ca)	5820		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Chromium (Cr)	35.6		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cobalt (Co)	3.99		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Copper (Cu)	8.57		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Iron (Fe)	12900		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lead (Pb)	2.93		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lithium (Li)	10.6		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Magnesium (Mg)	6650		20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Manganese (Mn)	135		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Molybdenum (Mo)	0.66		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Nickel (Ni)	15.0		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Phosphorus (P)	799		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Potassium (K)	2060		100	mg/kg	09-OCT-18	10-OCT-18	R4268336
Selenium (Se)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Silver (Ag)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sodium (Na)	7210		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Strontium (Sr)	26.4		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sulfur (S)	<1000		1000	mg/kg	09-OCT-18	10-OCT-18	R4268336
Thallium (Tl)	0.081		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tin (Sn)	<1.0		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Titanium (Ti)	512		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tungsten (W)	<0.50		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Uranium (U)	0.692		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Vanadium (V)	28.4		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zinc (Zn)	23.6		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zirconium (Zr)	4.2		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
L2170896-14 MBE-5 REP 2							
Sampled By: CLIENT on 13-SEP-18 @ 12:20							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-14 MBE-5 REP 2							
Sampled By: CLIENT on 13-SEP-18 @ 12:20							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.75		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.64		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.090		0.050	%		11-OCT-18	R4271167
Total Organic Carbon Calculation							
Total Organic Carbon	0.554		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0101		0.0050	mg/kg	09-OCT-18	09-OCT-18	R4268284
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.064		0.020	%	10-OCT-18	17-OCT-18	R4283767
Metals in Soil by CRC ICPMS							
Aluminum (Al)	6810		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Antimony (Sb)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Arsenic (As)	6.55		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Barium (Ba)	45.3		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Beryllium (Be)	0.15		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Boron (B)	16.2		5.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Bismuth (Bi)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cadmium (Cd)	<0.020		0.020	mg/kg	09-OCT-18	10-OCT-18	R4268336
Calcium (Ca)	5580		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Chromium (Cr)	36.2		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cobalt (Co)	4.04		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Copper (Cu)	10.3		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Iron (Fe)	13500		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lead (Pb)	3.20		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lithium (Li)	11.6		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Magnesium (Mg)	6610		20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Manganese (Mn)	135		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Molybdenum (Mo)	0.65		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Nickel (Ni)	15.0		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Phosphorus (P)	848		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Potassium (K)	2070		100	mg/kg	09-OCT-18	10-OCT-18	R4268336
Selenium (Se)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Silver (Ag)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sodium (Na)	7550		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Strontium (Sr)	27.9		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sulfur (S)	<1000		1000	mg/kg	09-OCT-18	10-OCT-18	R4268336
Thallium (Tl)	0.082		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tin (Sn)	<1.0		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Titanium (Ti)	515		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tungsten (W)	<0.50		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Uranium (U)	0.711		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Vanadium (V)	29.3		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zinc (Zn)	22.4		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zirconium (Zr)	4.1		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
L2170896-15 MBE-5 REP 3							
Sampled By: CLIENT on 13-SEP-18 @ 12:20							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-15 MBE-5 REP 3							
Sampled By: CLIENT on 13-SEP-18 @ 12:20							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.74		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.60		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.089		0.050	%		11-OCT-18	R4271167
Total Organic Carbon Calculation							
Total Organic Carbon	0.508		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0095		0.0050	mg/kg	09-OCT-18	09-OCT-18	R4268284
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.056		0.020	%	10-OCT-18	17-OCT-18	R4283767
Metals in Soil by CRC ICPMS							
Aluminum (Al)	6640		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Antimony (Sb)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Arsenic (As)	5.06		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Barium (Ba)	41.5		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Beryllium (Be)	0.14		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Boron (B)	13.8		5.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Bismuth (Bi)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cadmium (Cd)	<0.020		0.020	mg/kg	09-OCT-18	10-OCT-18	R4268336
Calcium (Ca)	5340		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Chromium (Cr)	34.0		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Cobalt (Co)	3.75		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Copper (Cu)	7.46		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Iron (Fe)	12300		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lead (Pb)	2.99		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Lithium (Li)	10.7		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Magnesium (Mg)	6040		20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Manganese (Mn)	128		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Molybdenum (Mo)	0.53		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Nickel (Ni)	13.9		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Phosphorus (P)	797		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Potassium (K)	1860		100	mg/kg	09-OCT-18	10-OCT-18	R4268336
Selenium (Se)	<0.20		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Silver (Ag)	<0.10		0.10	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sodium (Na)	5400		50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Strontium (Sr)	24.4		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Sulfur (S)	<1000		1000	mg/kg	09-OCT-18	10-OCT-18	R4268336
Thallium (Tl)	0.078		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tin (Sn)	<1.0		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Titanium (Ti)	499		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Tungsten (W)	<0.50		0.50	mg/kg	09-OCT-18	10-OCT-18	R4268336
Uranium (U)	0.719		0.050	mg/kg	09-OCT-18	10-OCT-18	R4268336
Vanadium (V)	27.5		0.20	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zinc (Zn)	22.2		2.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
Zirconium (Zr)	4.1		1.0	mg/kg	09-OCT-18	10-OCT-18	R4268336
L2170896-16 MB REF A1 REP 1							
Sampled By: CLIENT on 19-SEP-18 @ 08:30							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-16 MB REF A1 REP 1							
Sampled By: CLIENT on 19-SEP-18 @ 08:30							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.65		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.63		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.078		0.050	%		11-OCT-18	R4270928
Total Organic Carbon Calculation							
Total Organic Carbon	0.547		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0126		0.0050	mg/kg	11-OCT-18	12-OCT-18	R4276967
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.059		0.020	%	10-OCT-18	17-OCT-18	R4283767
Metals in Soil by CRC ICPMS							
Aluminum (Al)	7180		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Antimony (Sb)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Arsenic (As)	4.64		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Barium (Ba)	39.1		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Beryllium (Be)	0.16		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Boron (B)	17.4		5.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Bismuth (Bi)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cadmium (Cd)	<0.020		0.020	mg/kg	11-OCT-18	15-OCT-18	R4278629
Calcium (Ca)	6050		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Chromium (Cr)	29.9		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cobalt (Co)	3.81		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Copper (Cu)	6.76		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Iron (Fe)	12500		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lead (Pb)	3.38		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lithium (Li)	10.1		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Magnesium (Mg)	6690		20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Manganese (Mn)	137		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Molybdenum (Mo)	0.77		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Nickel (Ni)	12.8		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Phosphorus (P)	848		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Potassium (K)	2240		100	mg/kg	11-OCT-18	15-OCT-18	R4278629
Selenium (Se)	0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Silver (Ag)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sodium (Na)	10700		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Strontium (Sr)	28.3		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sulfur (S)	1200		1000	mg/kg	11-OCT-18	15-OCT-18	R4278629
Thallium (Tl)	0.088		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tin (Sn)	<1.0		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Titanium (Ti)	543		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tungsten (W)	<0.50		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Uranium (U)	0.906		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Vanadium (V)	28.1		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zinc (Zn)	23.1		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zirconium (Zr)	5.0		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
L2170896-17 MB REF A1 REP 2							
Sampled By: CLIENT on 19-SEP-18 @ 08:30							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-17 MB REF A1 REP 2							
Sampled By: CLIENT on 19-SEP-18 @ 08:30							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.71		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.58		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.085		0.050	%		11-OCT-18	R4270928
Total Organic Carbon Calculation							
Total Organic Carbon	0.499		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0118		0.0050	mg/kg	11-OCT-18	12-OCT-18	R4276967
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.066		0.020	%	12-OCT-18	15-OCT-18	R4280989
Metals in Soil by CRC ICPMS							
Aluminum (Al)	5980		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Antimony (Sb)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Arsenic (As)	4.56		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Barium (Ba)	37.1		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Beryllium (Be)	0.15		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Boron (B)	15.0		5.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Bismuth (Bi)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cadmium (Cd)	<0.020		0.020	mg/kg	11-OCT-18	15-OCT-18	R4278629
Calcium (Ca)	5560		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Chromium (Cr)	26.2		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cobalt (Co)	3.38		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Copper (Cu)	5.56		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Iron (Fe)	11300		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lead (Pb)	3.16		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lithium (Li)	9.4		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Magnesium (Mg)	5570		20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Manganese (Mn)	122		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Molybdenum (Mo)	0.65		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Nickel (Ni)	11.1		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Phosphorus (P)	767		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Potassium (K)	1830		100	mg/kg	11-OCT-18	15-OCT-18	R4278629
Selenium (Se)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Silver (Ag)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sodium (Na)	6650		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Strontium (Sr)	24.0		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sulfur (S)	<1000		1000	mg/kg	11-OCT-18	15-OCT-18	R4278629
Thallium (Tl)	0.083		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tin (Sn)	<1.0		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Titanium (Ti)	468		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tungsten (W)	<0.50		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Uranium (U)	0.830		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Vanadium (V)	24.8		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zinc (Zn)	20.5		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zirconium (Zr)	4.6		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
L2170896-18 MB REF A1 REP 3							
Sampled By: CLIENT on 19-SEP-18 @ 08:30							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-18 MB REF A1 REP 3							
Sampled By: CLIENT on 19-SEP-18 @ 08:30							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.68		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.61		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.082		0.050	%		11-OCT-18	R4270928
Total Organic Carbon Calculation							
Total Organic Carbon	0.525		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0123		0.0050	mg/kg	11-OCT-18	12-OCT-18	R4276967
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.065		0.020	%	12-OCT-18	15-OCT-18	R4280989
Metals in Soil by CRC ICPMS							
Aluminum (Al)	6400		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Antimony (Sb)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Arsenic (As)	4.67		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Barium (Ba)	36.1		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Beryllium (Be)	0.15		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Boron (B)	15.1		5.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Bismuth (Bi)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cadmium (Cd)	<0.020		0.020	mg/kg	11-OCT-18	15-OCT-18	R4278629
Calcium (Ca)	5480		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Chromium (Cr)	27.0		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cobalt (Co)	3.49		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Copper (Cu)	6.15		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Iron (Fe)	11300		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lead (Pb)	3.17		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lithium (Li)	9.3		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Magnesium (Mg)	5920		20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Manganese (Mn)	124		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Molybdenum (Mo)	0.62		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Nickel (Ni)	11.6		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Phosphorus (P)	799		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Potassium (K)	1930		100	mg/kg	11-OCT-18	15-OCT-18	R4278629
Selenium (Se)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Silver (Ag)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sodium (Na)	7410		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Strontium (Sr)	25.9		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sulfur (S)	<1000		1000	mg/kg	11-OCT-18	15-OCT-18	R4278629
Thallium (Tl)	0.081		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tin (Sn)	<1.0		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Titanium (Ti)	492		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tungsten (W)	<0.50		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Uranium (U)	0.810		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Vanadium (V)	25.5		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zinc (Zn)	21.1		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zirconium (Zr)	4.5		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
L2170896-19 MB REF A2 REP 1							
Sampled By: CLIENT on 19-SEP-18 @ 09:30							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-19 MB REF A2 REP 1							
Sampled By: CLIENT on 19-SEP-18 @ 09:30							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.70		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.66		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.085		0.050	%		11-OCT-18	R4270928
Total Organic Carbon Calculation							
Total Organic Carbon	0.577		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0127		0.0050	mg/kg	11-OCT-18	12-OCT-18	R4276967
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.069		0.020	%	12-OCT-18	15-OCT-18	R4280989
Metals in Soil by CRC ICPMS							
Aluminum (Al)	6380		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Antimony (Sb)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Arsenic (As)	4.49		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Barium (Ba)	35.0		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Beryllium (Be)	0.16		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Boron (B)	16.3		5.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Bismuth (Bi)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cadmium (Cd)	<0.020		0.020	mg/kg	11-OCT-18	15-OCT-18	R4278629
Calcium (Ca)	5740		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Chromium (Cr)	27.3		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cobalt (Co)	3.51		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Copper (Cu)	5.94		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Iron (Fe)	11500		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lead (Pb)	3.24		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lithium (Li)	10.5		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Magnesium (Mg)	5810		20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Manganese (Mn)	124		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Molybdenum (Mo)	0.65		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Nickel (Ni)	11.6		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Phosphorus (P)	741		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Potassium (K)	1960		100	mg/kg	11-OCT-18	15-OCT-18	R4278629
Selenium (Se)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Silver (Ag)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sodium (Na)	6960		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Strontium (Sr)	25.8		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sulfur (S)	<1000		1000	mg/kg	11-OCT-18	15-OCT-18	R4278629
Thallium (Tl)	0.083		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tin (Sn)	<1.0		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Titanium (Ti)	470		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tungsten (W)	<0.50		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Uranium (U)	0.822		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Vanadium (V)	25.4		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zinc (Zn)	20.6		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zirconium (Zr)	4.7		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
L2170896-20 MB REF A2 REP 2							
Sampled By: CLIENT on 19-SEP-18 @ 09:30							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-20 MB REF A2 REP 2							
Sampled By: CLIENT on 19-SEP-18 @ 09:30							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.72		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.69		0.05	%	05-OCT-18	05-OCT-18	R4263371
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.087		0.050	%		11-OCT-18	R4270928
Total Organic Carbon Calculation							
Total Organic Carbon	0.603		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0135		0.0050	mg/kg	11-OCT-18	12-OCT-18	R4276967
Special Request	See Attached				12-OCT-18	16-OCT-18	R4281910
Total Kjeldahl Nitrogen	0.074		0.020	%	12-OCT-18	15-OCT-18	R4280989
Metals in Soil by CRC ICPMS							
Aluminum (Al)	6630		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Antimony (Sb)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Arsenic (As)	4.96		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Barium (Ba)	38.0		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Beryllium (Be)	0.14		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Boron (B)	16.5		5.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Bismuth (Bi)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cadmium (Cd)	<0.020		0.020	mg/kg	11-OCT-18	15-OCT-18	R4278629
Calcium (Ca)	5660		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Chromium (Cr)	27.7		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cobalt (Co)	3.65		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Copper (Cu)	6.40		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Iron (Fe)	12100		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lead (Pb)	3.24		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lithium (Li)	9.6		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Magnesium (Mg)	6040		20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Manganese (Mn)	128		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Molybdenum (Mo)	0.63		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Nickel (Ni)	11.7		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Phosphorus (P)	799		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Potassium (K)	2070		100	mg/kg	11-OCT-18	15-OCT-18	R4278629
Selenium (Se)	0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Silver (Ag)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sodium (Na)	8050		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Strontium (Sr)	26.9		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sulfur (S)	<1000		1000	mg/kg	11-OCT-18	15-OCT-18	R4278629
Thallium (Tl)	0.083		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tin (Sn)	<1.0		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Titanium (Ti)	477		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tungsten (W)	<0.50		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Uranium (U)	0.813		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Vanadium (V)	26.2		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zinc (Zn)	21.8		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zirconium (Zr)	4.3		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
L2170896-21 MB REF A2 REP 3							
Sampled By: CLIENT on 19-SEP-18 @ 09:30							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-21 MB REF A2 REP 3							
Sampled By: CLIENT on 19-SEP-18 @ 09:30							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.76		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.74		0.05	%	10-OCT-18	10-OCT-18	R4270350
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.092		0.050	%		11-OCT-18	R4270928
Total Organic Carbon Calculation							
Total Organic Carbon	0.651		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0133		0.0050	mg/kg	11-OCT-18	12-OCT-18	R4276967
Special Request	See Attached				12-OCT-18	15-OCT-18	R4281568
Total Kjeldahl Nitrogen	0.069		0.020	%	12-OCT-18	15-OCT-18	R4280989
Metals in Soil by CRC ICPMS							
Aluminum (Al)	6740		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Antimony (Sb)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Arsenic (As)	5.06		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Barium (Ba)	38.5		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Beryllium (Be)	0.15		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Boron (B)	16.9		5.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Bismuth (Bi)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cadmium (Cd)	<0.020		0.020	mg/kg	11-OCT-18	15-OCT-18	R4278629
Calcium (Ca)	5850		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Chromium (Cr)	29.4		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cobalt (Co)	3.80		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Copper (Cu)	6.72		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Iron (Fe)	12600		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lead (Pb)	3.34		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lithium (Li)	10.9		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Magnesium (Mg)	6200		20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Manganese (Mn)	134		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Molybdenum (Mo)	0.66		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Nickel (Ni)	13.3		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Phosphorus (P)	834		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Potassium (K)	2090		100	mg/kg	11-OCT-18	15-OCT-18	R4278629
Selenium (Se)	0.21		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Silver (Ag)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sodium (Na)	7050		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Strontium (Sr)	25.4		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sulfur (S)	<1000		1000	mg/kg	11-OCT-18	15-OCT-18	R4278629
Thallium (Tl)	0.089		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tin (Sn)	<1.0		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Titanium (Ti)	498		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tungsten (W)	<0.50		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Uranium (U)	0.856		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Vanadium (V)	27.5		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zinc (Zn)	22.7		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zirconium (Zr)	4.5		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
L2170896-22 MB REF A3 REP 1							
Sampled By: CLIENT on 19-SEP-18 @ 12:00							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-22 MB REF A3 REP 1							
Sampled By: CLIENT on 19-SEP-18 @ 12:00							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.76		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.85		0.05	%	10-OCT-18	10-OCT-18	R4270350
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.091		0.050	%		11-OCT-18	R4270928
Total Organic Carbon Calculation							
Total Organic Carbon	0.755		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0144		0.0050	mg/kg	11-OCT-18	12-OCT-18	R4276967
Special Request	See Attached				12-OCT-18	15-OCT-18	R4281568
Total Kjeldahl Nitrogen	0.085		0.020	%	12-OCT-18	15-OCT-18	R4280989
Metals in Soil by CRC ICPMS							
Aluminum (Al)	7660		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Antimony (Sb)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Arsenic (As)	5.66		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Barium (Ba)	43.0		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Beryllium (Be)	0.17		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Boron (B)	20.8		5.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Bismuth (Bi)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cadmium (Cd)	<0.020		0.020	mg/kg	11-OCT-18	15-OCT-18	R4278629
Calcium (Ca)	5820		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Chromium (Cr)	31.7		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cobalt (Co)	4.03		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Copper (Cu)	6.84		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Iron (Fe)	13300		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lead (Pb)	3.79		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lithium (Li)	11.4		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Magnesium (Mg)	7000		20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Manganese (Mn)	140		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Molybdenum (Mo)	0.78		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Nickel (Ni)	13.4		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Phosphorus (P)	730		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Potassium (K)	2490		100	mg/kg	11-OCT-18	15-OCT-18	R4278629
Selenium (Se)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Silver (Ag)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sodium (Na)	10500		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Strontium (Sr)	30.0		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sulfur (S)	1200		1000	mg/kg	11-OCT-18	15-OCT-18	R4278629
Thallium (Tl)	0.096		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tin (Sn)	<1.0		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Titanium (Ti)	517		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tungsten (W)	<0.50		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Uranium (U)	0.868		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Vanadium (V)	29.9		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zinc (Zn)	24.6		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zirconium (Zr)	4.8		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
L2170896-23 MB REF A3 REP 2							
Sampled By: CLIENT on 19-SEP-18 @ 12:00							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-23 MB REF A3 REP 2							
Sampled By: CLIENT on 19-SEP-18 @ 12:00							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.78		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.71		0.05	%	10-OCT-18	10-OCT-18	R4270350
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.093		0.050	%		11-OCT-18	R4270928
Total Organic Carbon Calculation							
Total Organic Carbon	0.613		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0127		0.0050	mg/kg	11-OCT-18	12-OCT-18	R4276967
Special Request	See Attached				12-OCT-18	15-OCT-18	R4281568
Total Kjeldahl Nitrogen	0.071		0.020	%	12-OCT-18	15-OCT-18	R4280989
Metals in Soil by CRC ICPMS							
Aluminum (Al)	7750		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Antimony (Sb)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Arsenic (As)	6.17		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Barium (Ba)	45.5		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Beryllium (Be)	0.17		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Boron (B)	17.1		5.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Bismuth (Bi)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cadmium (Cd)	0.020		0.020	mg/kg	11-OCT-18	15-OCT-18	R4278629
Calcium (Ca)	5420		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Chromium (Cr)	32.9		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cobalt (Co)	4.43		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Copper (Cu)	7.14		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Iron (Fe)	13800		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lead (Pb)	3.72		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lithium (Li)	10.4		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Magnesium (Mg)	6780		20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Manganese (Mn)	149		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Molybdenum (Mo)	0.66		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Nickel (Ni)	13.7		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Phosphorus (P)	836		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Potassium (K)	2390		100	mg/kg	11-OCT-18	15-OCT-18	R4278629
Selenium (Se)	0.22		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Silver (Ag)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sodium (Na)	7140		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Strontium (Sr)	26.4		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sulfur (S)	<1000		1000	mg/kg	11-OCT-18	15-OCT-18	R4278629
Thallium (Tl)	0.093		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tin (Sn)	<1.0		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Titanium (Ti)	571		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tungsten (W)	<0.50		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Uranium (U)	0.886		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Vanadium (V)	31.1		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zinc (Zn)	25.6		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zirconium (Zr)	4.7		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
L2170896-24 MB REF A3 REP 3							
Sampled By: CLIENT on 19-SEP-18 @ 12:00							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-24 MB REF A3 REP 3							
Sampled By: CLIENT on 19-SEP-18 @ 12:00							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.63		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.59		0.05	%	10-OCT-18	10-OCT-18	R4270350
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.075		0.050	%		11-OCT-18	R4270928
Total Organic Carbon Calculation							
Total Organic Carbon	0.511		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0096		0.0050	mg/kg	11-OCT-18	12-OCT-18	R4276967
Special Request	See Attached				12-OCT-18	15-OCT-18	R4281568
Total Kjeldahl Nitrogen	0.058		0.020	%	12-OCT-18	15-OCT-18	R4280989
Metals in Soil by CRC ICPMS							
Aluminum (Al)	6050		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Antimony (Sb)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Arsenic (As)	4.51		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Barium (Ba)	35.4		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Beryllium (Be)	0.14		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Boron (B)	14.8		5.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Bismuth (Bi)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cadmium (Cd)	<0.020		0.020	mg/kg	11-OCT-18	15-OCT-18	R4278629
Calcium (Ca)	5260		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Chromium (Cr)	26.7		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cobalt (Co)	3.35		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Copper (Cu)	6.09		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Iron (Fe)	10900		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lead (Pb)	3.06		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lithium (Li)	9.0		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Magnesium (Mg)	5480		20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Manganese (Mn)	118		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Molybdenum (Mo)	0.63		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Nickel (Ni)	10.9		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Phosphorus (P)	695		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Potassium (K)	1910		100	mg/kg	11-OCT-18	15-OCT-18	R4278629
Selenium (Se)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Silver (Ag)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sodium (Na)	7990		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Strontium (Sr)	25.2		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sulfur (S)	<1000		1000	mg/kg	11-OCT-18	15-OCT-18	R4278629
Thallium (Tl)	0.078		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tin (Sn)	<1.0		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Titanium (Ti)	455		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tungsten (W)	<0.50		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Uranium (U)	0.716		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Vanadium (V)	24.4		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zinc (Zn)	20.2		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zirconium (Zr)	4.1		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
L2170896-25 MB REF 1							
Sampled By: CLIENT on 19-SEP-18 @ 15:30							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-25 MB REF 1							
Sampled By: CLIENT on 19-SEP-18 @ 15:30							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.70		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.52		0.05	%	10-OCT-18	10-OCT-18	R4270350
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.083		0.050	%		11-OCT-18	R4270928
Total Organic Carbon Calculation							
Total Organic Carbon	0.440		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0094		0.0050	mg/kg	11-OCT-18	12-OCT-18	R4276967
Special Request	See Attached				12-OCT-18	15-OCT-18	R4281568
Total Kjeldahl Nitrogen	0.052		0.020	%	12-OCT-18	15-OCT-18	R4280989
Metals in Soil by CRC ICPMS							
Aluminum (Al)	6150		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Antimony (Sb)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Arsenic (As)	5.68		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Barium (Ba)	31.6		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Beryllium (Be)	0.14		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Boron (B)	14.6		5.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Bismuth (Bi)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cadmium (Cd)	<0.020		0.020	mg/kg	11-OCT-18	15-OCT-18	R4278629
Calcium (Ca)	5120		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Chromium (Cr)	34.2		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cobalt (Co)	3.39		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Copper (Cu)	5.49		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Iron (Fe)	12100		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lead (Pb)	3.11		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lithium (Li)	9.2		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Magnesium (Mg)	5950		20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Manganese (Mn)	127		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Molybdenum (Mo)	0.75		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Nickel (Ni)	12.6		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Phosphorus (P)	575		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Potassium (K)	1850		100	mg/kg	11-OCT-18	15-OCT-18	R4278629
Selenium (Se)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Silver (Ag)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sodium (Na)	7840		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Strontium (Sr)	25.5		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sulfur (S)	<1000		1000	mg/kg	11-OCT-18	15-OCT-18	R4278629
Thallium (Tl)	0.103		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tin (Sn)	<1.0		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Titanium (Ti)	382		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tungsten (W)	<0.50		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Uranium (U)	0.649		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Vanadium (V)	27.4		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zinc (Zn)	20.5		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zirconium (Zr)	3.2		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
L2170896-26 DUP A							
Sampled By: CLIENT on 13-SEP-18 @ 17:00							
Matrix: Marine Sediment							
Total Carbon, TOC and TIC in soil							
Inorganic Carbon as CaCO3 Equivalent							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-26 DUP A							
Sampled By: CLIENT on 13-SEP-18 @ 17:00							
Matrix: Marine Sediment							
Inorganic Carbon as CaCO3 Equivalent							
Inorganic Carbon (as CaCO3 Equivalent)	0.74		0.40	%		11-OCT-18	
Total Carbon by combustion method							
Total Carbon by Combustion	0.64		0.05	%	10-OCT-18	10-OCT-18	R4270350
Total Inorganic Carbon in Soil							
Inorganic Carbon	0.089		0.050	%		11-OCT-18	R4270928
Total Organic Carbon Calculation							
Total Organic Carbon	0.551		0.050	%		11-OCT-18	
Miscellaneous Parameters							
Mercury (Hg)	0.0109		0.0050	mg/kg	11-OCT-18	12-OCT-18	R4276967
Special Request	See Attached				12-OCT-18	15-OCT-18	R4281568
Total Kjeldahl Nitrogen	0.058		0.020	%	12-OCT-18	15-OCT-18	R4280989
Metals in Soil by CRC ICPMS							
Aluminum (Al)	7380		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Antimony (Sb)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Arsenic (As)	4.70		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Barium (Ba)	40.1		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Beryllium (Be)	0.15		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Boron (B)	14.9		5.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Bismuth (Bi)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cadmium (Cd)	<0.020		0.020	mg/kg	11-OCT-18	15-OCT-18	R4278629
Calcium (Ca)	6140		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Chromium (Cr)	36.9		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Cobalt (Co)	4.11		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Copper (Cu)	7.77		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Iron (Fe)	12200		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lead (Pb)	3.51		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Lithium (Li)	10.5		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Magnesium (Mg)	6500		20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Manganese (Mn)	139		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Molybdenum (Mo)	0.63		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Nickel (Ni)	15.1		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Phosphorus (P)	765		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Potassium (K)	1960		100	mg/kg	11-OCT-18	15-OCT-18	R4278629
Selenium (Se)	<0.20		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Silver (Ag)	<0.10		0.10	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sodium (Na)	5920		50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Strontium (Sr)	27.4		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Sulfur (S)	<1000		1000	mg/kg	11-OCT-18	15-OCT-18	R4278629
Thallium (Tl)	0.089		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tin (Sn)	<1.0		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Titanium (Ti)	500		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Tungsten (W)	<0.50		0.50	mg/kg	11-OCT-18	15-OCT-18	R4278629
Uranium (U)	0.838		0.050	mg/kg	11-OCT-18	15-OCT-18	R4278629
Vanadium (V)	28.8		0.20	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zinc (Zn)	22.9		2.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
Zirconium (Zr)	4.6		1.0	mg/kg	11-OCT-18	15-OCT-18	R4278629
L2170896-27 MW REF A3 D							
Sampled By: CLIENT on 20-SEP-18 @ 11:00							
Matrix: Marine H2O							
Alkalinity Species by Titration							
Alkalinity Spec by Titration (Seawater)							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-27 MW REF A3 D							
Sampled By: CLIENT on 20-SEP-18 @ 11:00							
Matrix: Marine H2O							
Alkalinity Spec by Titration (Seawater)							
Alkalinity, Bicarbonate (as CaCO3)	114		1.0	mg/L		02-OCT-18	R4257666
Alkalinity, Carbonate (as CaCO3)	<1.0		1.0	mg/L		02-OCT-18	R4257666
Alkalinity, Hydroxide (as CaCO3)	<1.0		1.0	mg/L		02-OCT-18	R4257666
Alkalinity, Total (as CaCO3)	114		1.0	mg/L		02-OCT-18	R4257666
Anions by Ion Chromatography (seawater)							
Bromide by IC (seawater)							
Bromide (Br)	60.4		5.0	mg/L		02-OCT-18	R4258739
Chloride by IC (seawater)							
Chloride (Cl)	17400		50	mg/L		02-OCT-18	R4258739
Fluoride by IC (seawater)							
Fluoride (F)	1.0		1.0	mg/L		02-OCT-18	R4258739
Nitrate in Seawater by IC							
Nitrate (as N)	<0.50		0.50	mg/L		02-OCT-18	R4258739
Nitrite in Seawater by IC							
Nitrite (as N)	<0.10		0.10	mg/L		02-OCT-18	R4258739
Sulfate by IC (seawater)							
Sulfate (SO4)	2450		30	mg/L		02-OCT-18	R4258739
Dissolved ICPOES & HR-ICPMS in Seawater							
Diss. Metals in Seawater by HR-ICPMS							
Dissolved Metals Filtration Location	LAB					08-OCT-18	R4263895
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	08-OCT-18	19-OCT-18	R4288587
Antimony (Sb)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Arsenic (As)-Dissolved	<0.0020		0.0020	mg/L	08-OCT-18	19-OCT-18	R4288587
Barium (Ba)-Dissolved	0.0105		0.0010	mg/L	08-OCT-18	19-OCT-18	R4288587
Beryllium (Be)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Bismuth (Bi)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Boron (B)-Dissolved	4.16		0.10	mg/L	08-OCT-18	19-OCT-18	R4288587
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L	08-OCT-18	19-OCT-18	R4288587
Calcium (Ca)-Dissolved	336		1.0	mg/L	08-OCT-18	19-OCT-18	R4288587
Cesium (Cs)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Cobalt (Co)-Dissolved	<0.000050		0.000050	mg/L	08-OCT-18	19-OCT-18	R4288587
Copper (Cu)-Dissolved	0.00126		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Gallium (Ga)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	08-OCT-18	19-OCT-18	R4288587
Lead (Pb)-Dissolved	<0.00030		0.00030	mg/L	08-OCT-18	19-OCT-18	R4288587
Lithium (Li)-Dissolved	0.190		0.020	mg/L	08-OCT-18	19-OCT-18	R4288587
Magnesium (Mg)-Dissolved	1010		1.0	mg/L	08-OCT-18	19-OCT-18	R4288587
Manganese (Mn)-Dissolved	0.00082		0.00020	mg/L	08-OCT-18	19-OCT-18	R4288587
Molybdenum (Mo)-Dissolved	0.0124		0.0020	mg/L	08-OCT-18	19-OCT-18	R4288587
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	08-OCT-18	19-OCT-18	R4288587
Potassium (K)-Dissolved	327		20	mg/L	08-OCT-18	19-OCT-18	R4288587
Rhenium (Re)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Rubidium (Rb)-Dissolved	0.113		0.0050	mg/L	08-OCT-18	19-OCT-18	R4288587
Selenium (Se)-Dissolved	<0.0020		0.0020	mg/L	08-OCT-18	19-OCT-18	R4288587
Silicon (Si)-Dissolved	<1.0		1.0	mg/L	08-OCT-18	19-OCT-18	R4288587
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L	08-OCT-18	19-OCT-18	R4288587
Sodium (Na)-Dissolved	8710		20	mg/L	08-OCT-18	19-OCT-18	R4288587
Strontium (Sr)-Dissolved	5.60		0.050	mg/L	08-OCT-18	19-OCT-18	R4288587
Sulfur (S)-Dissolved	746		5.0	mg/L	08-OCT-18	19-OCT-18	R4288587
Tellurium (Te)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-27 MW REF A3 D							
Sampled By: CLIENT on 20-SEP-18 @ 11:00							
Matrix: Marine H2O							
Diss. Metals in Seawater by HR-ICPMS							
Thallium (Tl)-Dissolved	<0.000050		0.000050	mg/L	08-OCT-18	19-OCT-18	R4288587
Thorium (Th)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Tin (Sn)-Dissolved	<0.0010		0.0010	mg/L	08-OCT-18	19-OCT-18	R4288587
Titanium (Ti)-Dissolved	<0.0050		0.0050	mg/L	08-OCT-18	19-OCT-18	R4288587
Tungsten (W)-Dissolved	<0.0010		0.0010	mg/L	08-OCT-18	19-OCT-18	R4288587
Uranium (U)-Dissolved	0.00308		0.000050	mg/L	08-OCT-18	19-OCT-18	R4288587
Vanadium (V)-Dissolved	0.00135		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Yttrium (Y)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Zinc (Zn)-Dissolved	<0.0030		0.0030	mg/L	08-OCT-18	19-OCT-18	R4288587
Zirconium (Zr)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Hardness							
Hardness (as CaCO3)	5000		4.8	mg/L		19-OCT-18	
Total ICPOES & HR-ICPMS in Seawater							
Tot. Metals in Seawater by HR-ICPMS							
Aluminum (Al)-Total	0.0304		0.0050	mg/L		19-OCT-18	R4288587
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Arsenic (As)-Total	<0.0020		0.0020	mg/L		19-OCT-18	R4288587
Barium (Ba)-Total	0.0107		0.0010	mg/L		19-OCT-18	R4288587
Beryllium (Be)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Boron (B)-Total	4.08		0.10	mg/L		19-OCT-18	R4288587
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		19-OCT-18	R4288587
Calcium (Ca)-Total	338		1.0	mg/L		19-OCT-18	R4288587
Cesium (Cs)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Chromium (Cr)-Total	0.00075		0.00050	mg/L		19-OCT-18	R4288587
Cobalt (Co)-Total	0.000080		0.000050	mg/L		19-OCT-18	R4288587
Copper (Cu)-Total	0.00121		0.00050	mg/L		19-OCT-18	R4288587
Gallium (Ga)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Iron (Fe)-Total	0.053		0.010	mg/L		19-OCT-18	R4288587
Lead (Pb)-Total	<0.00030		0.00030	mg/L		19-OCT-18	R4288587
Lithium (Li)-Total	0.194		0.020	mg/L		19-OCT-18	R4288587
Magnesium (Mg)-Total	1020		1.0	mg/L		19-OCT-18	R4288587
Manganese (Mn)-Total	0.00161		0.00020	mg/L		19-OCT-18	R4288587
Molybdenum (Mo)-Total	0.0122		0.0020	mg/L		19-OCT-18	R4288587
Nickel (Ni)-Total	0.00052		0.00050	mg/L		19-OCT-18	R4288587
Phosphorus (P)-Total	<0.050		0.050	mg/L		19-OCT-18	R4288587
Potassium (K)-Total	337		1.0	mg/L		19-OCT-18	R4288587
Rhenium (Re)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Rubidium (Rb)-Total	0.113		0.0050	mg/L		19-OCT-18	R4288587
Selenium (Se)-Total	<0.0020		0.0020	mg/L		19-OCT-18	R4288587
Silicon (Si)-Total	<1.0		1.0	mg/L		19-OCT-18	R4288587
Silver (Ag)-Total	<0.00010		0.00010	mg/L		19-OCT-18	R4288587
Sodium (Na)-Total	8910		1.0	mg/L		19-OCT-18	R4288587
Strontium (Sr)-Total	5.52		0.010	mg/L		19-OCT-18	R4288587
Sulfur (S)-Total	739		5.0	mg/L		19-OCT-18	R4288587
Tellurium (Te)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Thallium (Tl)-Total	<0.000050		0.000050	mg/L		19-OCT-18	R4288587
Thorium (Th)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Tin (Sn)-Total	<0.0010		0.0010	mg/L		19-OCT-18	R4288587
Titanium (Ti)-Total	<0.0050		0.0050	mg/L		19-OCT-18	R4288587
Tungsten (W)-Total	<0.0010		0.0010	mg/L		19-OCT-18	R4288587

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-27 MW REF A3 D							
Sampled By: CLIENT on 20-SEP-18 @ 11:00							
Matrix: Marine H2O							
Tot. Metals in Seawater by HR-ICPMS							
Uranium (U)-Total	0.00289		0.000050	mg/L		19-OCT-18	R4288587
Vanadium (V)-Total	0.00162		0.00050	mg/L		19-OCT-18	R4288587
Yttrium (Y)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		19-OCT-18	R4288587
Zirconium (Zr)-Total	0.00092		0.00050	mg/L		19-OCT-18	R4288587
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		16-OCT-18	R4282102
Conductivity	46700		2.0	uS/cm		02-OCT-18	R4257666
Orthophosphate-Dissolved (as P)	0.0187		0.0010	mg/L		29-SEP-18	R4252115
Dissolved Organic Carbon	0.99		0.50	mg/L		02-OCT-18	R4257979
Silicate (as SiO2)	0.295		0.010	mg/L		03-OCT-18	R4258600
Total Kjeldahl Nitrogen	0.127		0.050	mg/L	10-OCT-18	11-OCT-18	R4272089
Total Organic Carbon	1.16		0.50	mg/L		02-OCT-18	R4257978
Total Dissolved Solids	35400		80	mg/L		29-SEP-18	R4253115
Mercury (Hg)-Total	<0.000010		0.000010	mg/L		06-OCT-18	R4263241
Phosphorus (P)-Total	0.0273		0.0040	mg/L		01-OCT-18	R4255689
Total Suspended Solids	2.4		2.0	mg/L		29-SEP-18	R4253121
pH	7.99		0.10	pH		02-OCT-18	R4257666
Salinity	30.9		1.0	psu		03-OCT-18	
Diss. Mercury in Seawater by CVAFS							
Dissolved Mercury Filtration Location	LAB					15-OCT-18	R4278475
Dissolved Mercury Filtration Location	LAB					11-OCT-18	R4269591
Dissolved Mercury Filtration Location	LAB					14-OCT-18	R4277474
Mercury (Hg)-Dissolved	<0.000010		0.000010	mg/L	15-OCT-18	16-OCT-18	R4280190
L2170896-28 MW REF A3 S							
Sampled By: CLIENT on 20-SEP-18 @ 11:00							
Matrix: Marine H2O							
Alkalinity Species by Titration							
Alkalinity Spec by Titration (Seawater)							
Alkalinity, Bicarbonate (as CaCO3)	113		1.0	mg/L		02-OCT-18	R4257666
Alkalinity, Carbonate (as CaCO3)	<1.0		1.0	mg/L		02-OCT-18	R4257666
Alkalinity, Hydroxide (as CaCO3)	<1.0		1.0	mg/L		02-OCT-18	R4257666
Alkalinity, Total (as CaCO3)	113		1.0	mg/L		02-OCT-18	R4257666
Anions by Ion Chromatography (seawater)							
Bromide by IC (seawater)							
Bromide (Br)	65.2		5.0	mg/L		02-OCT-18	R4258739
Chloride by IC (seawater)							
Chloride (Cl)	18800		50	mg/L		02-OCT-18	R4258739
Fluoride by IC (seawater)							
Fluoride (F)	1.1		1.0	mg/L		02-OCT-18	R4258739
Nitrate in Seawater by IC							
Nitrate (as N)	<0.50		0.50	mg/L		02-OCT-18	R4258739
Nitrite in Seawater by IC							
Nitrite (as N)	<0.10		0.10	mg/L		02-OCT-18	R4258739
Sulfate by IC (seawater)							
Sulfate (SO4)	2660		30	mg/L		02-OCT-18	R4258739
Dissolved ICPOES & HR-ICPMS in Seawater							
Diss. Metals in Seawater by HR-ICPMS							
Dissolved Metals Filtration Location	LAB					08-OCT-18	R4263895
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	08-OCT-18	19-OCT-18	R4288587

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-28 MW REF A3 S							
Sampled By: CLIENT on 20-SEP-18 @ 11:00							
Matrix: Marine H2O							
Diss. Metals in Seawater by HR-ICPMS							
Antimony (Sb)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Arsenic (As)-Dissolved	<0.0020		0.0020	mg/L	08-OCT-18	19-OCT-18	R4288587
Barium (Ba)-Dissolved	0.0103		0.0010	mg/L	08-OCT-18	19-OCT-18	R4288587
Beryllium (Be)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Bismuth (Bi)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Boron (B)-Dissolved	4.14		0.10	mg/L	08-OCT-18	19-OCT-18	R4288587
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L	08-OCT-18	19-OCT-18	R4288587
Calcium (Ca)-Dissolved	329		1.0	mg/L	08-OCT-18	19-OCT-18	R4288587
Cesium (Cs)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Cobalt (Co)-Dissolved	<0.000050		0.000050	mg/L	08-OCT-18	19-OCT-18	R4288587
Copper (Cu)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Gallium (Ga)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	08-OCT-18	19-OCT-18	R4288587
Lead (Pb)-Dissolved	<0.00030		0.00030	mg/L	08-OCT-18	19-OCT-18	R4288587
Lithium (Li)-Dissolved	0.205		0.020	mg/L	08-OCT-18	19-OCT-18	R4288587
Magnesium (Mg)-Dissolved	1000		1.0	mg/L	08-OCT-18	19-OCT-18	R4288587
Manganese (Mn)-Dissolved	0.00044		0.00020	mg/L	08-OCT-18	19-OCT-18	R4288587
Molybdenum (Mo)-Dissolved	0.0127		0.0020	mg/L	08-OCT-18	19-OCT-18	R4288587
Nickel (Ni)-Dissolved	0.00055		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	08-OCT-18	19-OCT-18	R4288587
Potassium (K)-Dissolved	337		20	mg/L	08-OCT-18	19-OCT-18	R4288587
Rhenium (Re)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Rubidium (Rb)-Dissolved	0.114		0.0050	mg/L	08-OCT-18	19-OCT-18	R4288587
Selenium (Se)-Dissolved	<0.0020		0.0020	mg/L	08-OCT-18	19-OCT-18	R4288587
Silicon (Si)-Dissolved	<1.0		1.0	mg/L	08-OCT-18	19-OCT-18	R4288587
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L	08-OCT-18	19-OCT-18	R4288587
Sodium (Na)-Dissolved	8850		20	mg/L	08-OCT-18	19-OCT-18	R4288587
Strontium (Sr)-Dissolved	5.54		0.050	mg/L	08-OCT-18	19-OCT-18	R4288587
Sulfur (S)-Dissolved	739		5.0	mg/L	08-OCT-18	19-OCT-18	R4288587
Tellurium (Te)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Thallium (Tl)-Dissolved	<0.000050		0.000050	mg/L	08-OCT-18	19-OCT-18	R4288587
Thorium (Th)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Tin (Sn)-Dissolved	<0.0010		0.0010	mg/L	08-OCT-18	19-OCT-18	R4288587
Titanium (Ti)-Dissolved	<0.0050		0.0050	mg/L	08-OCT-18	19-OCT-18	R4288587
Tungsten (W)-Dissolved	<0.0010		0.0010	mg/L	08-OCT-18	19-OCT-18	R4288587
Uranium (U)-Dissolved	0.00291		0.000050	mg/L	08-OCT-18	19-OCT-18	R4288587
Vanadium (V)-Dissolved	0.00133		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Yttrium (Y)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Zinc (Zn)-Dissolved	<0.0030		0.0030	mg/L	08-OCT-18	19-OCT-18	R4288587
Zirconium (Zr)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Hardness							
Hardness (as CaCO3)	4940		4.8	mg/L		19-OCT-18	
Total ICPOES & HR-ICPMS in Seawater							
Tot. Metals in Seawater by HR-ICPMS							
Aluminum (Al)-Total	0.0147		0.0050	mg/L		19-OCT-18	R4288587
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Arsenic (As)-Total	<0.0020		0.0020	mg/L		19-OCT-18	R4288587
Barium (Ba)-Total	0.0105		0.0010	mg/L		19-OCT-18	R4288587
Beryllium (Be)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-28 MW REF A3 S							
Sampled By: CLIENT on 20-SEP-18 @ 11:00							
Matrix: Marine H2O							
Tot. Metals in Seawater by HR-ICPMS							
Boron (B)-Total	4.22		0.10	mg/L		19-OCT-18	R4288587
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		19-OCT-18	R4288587
Calcium (Ca)-Total	340		1.0	mg/L		19-OCT-18	R4288587
Cesium (Cs)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Chromium (Cr)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Cobalt (Co)-Total	0.000058		0.000050	mg/L		19-OCT-18	R4288587
Copper (Cu)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Gallium (Ga)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Iron (Fe)-Total	0.028		0.010	mg/L		19-OCT-18	R4288587
Lead (Pb)-Total	<0.00030		0.00030	mg/L		19-OCT-18	R4288587
Lithium (Li)-Total	0.206		0.020	mg/L		19-OCT-18	R4288587
Magnesium (Mg)-Total	960		1.0	mg/L		19-OCT-18	R4288587
Manganese (Mn)-Total	0.00091		0.00020	mg/L		19-OCT-18	R4288587
Molybdenum (Mo)-Total	0.0127		0.0020	mg/L		19-OCT-18	R4288587
Nickel (Ni)-Total	0.00053		0.00050	mg/L		19-OCT-18	R4288587
Phosphorus (P)-Total	<0.050		0.050	mg/L		19-OCT-18	R4288587
Potassium (K)-Total	349		1.0	mg/L		19-OCT-18	R4288587
Rhenium (Re)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Rubidium (Rb)-Total	0.118		0.0050	mg/L		19-OCT-18	R4288587
Selenium (Se)-Total	<0.0020		0.0020	mg/L		19-OCT-18	R4288587
Silicon (Si)-Total	<1.0		1.0	mg/L		19-OCT-18	R4288587
Silver (Ag)-Total	<0.00010		0.00010	mg/L		19-OCT-18	R4288587
Sodium (Na)-Total	8870		1.0	mg/L		19-OCT-18	R4288587
Strontium (Sr)-Total	5.51		0.010	mg/L		19-OCT-18	R4288587
Sulfur (S)-Total	721		5.0	mg/L		19-OCT-18	R4288587
Tellurium (Te)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Thallium (Tl)-Total	<0.000050		0.000050	mg/L		19-OCT-18	R4288587
Thorium (Th)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Tin (Sn)-Total	<0.0010		0.0010	mg/L		19-OCT-18	R4288587
Titanium (Ti)-Total	<0.0050		0.0050	mg/L		19-OCT-18	R4288587
Tungsten (W)-Total	<0.0010		0.0010	mg/L		19-OCT-18	R4288587
Uranium (U)-Total	0.00304		0.000050	mg/L		19-OCT-18	R4288587
Vanadium (V)-Total	0.00140		0.00050	mg/L		19-OCT-18	R4288587
Yttrium (Y)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		19-OCT-18	R4288587
Zirconium (Zr)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		16-OCT-18	R4282102
Conductivity	46800		2.0	uS/cm		02-OCT-18	R4257666
Orthophosphate-Dissolved (as P)	0.0181		0.0010	mg/L		29-SEP-18	R4252115
Dissolved Organic Carbon	0.97		0.50	mg/L		02-OCT-18	R4257979
Silicate (as SiO2)	0.308		0.010	mg/L		03-OCT-18	R4258600
Total Kjeldahl Nitrogen	0.128		0.050	mg/L	10-OCT-18	11-OCT-18	R4272089
Total Organic Carbon	1.01		0.50	mg/L		02-OCT-18	R4257978
Total Dissolved Solids	35400		80	mg/L		29-SEP-18	R4253115
Mercury (Hg)-Total	<0.000010		0.000010	mg/L		06-OCT-18	R4263241
Phosphorus (P)-Total	0.0248		0.0040	mg/L		01-OCT-18	R4255689
Total Suspended Solids	<2.0		2.0	mg/L		29-SEP-18	R4253121
pH	7.99		0.10	pH		02-OCT-18	R4257666
Salinity	31.0		1.0	psu		03-OCT-18	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-28 MW REF A3 S							
Sampled By: CLIENT on 20-SEP-18 @ 11:00							
Matrix: Marine H2O							
Diss. Mercury in Seawater by CVAFS							
Dissolved Mercury Filtration Location	LAB					11-OCT-18	R4269591
Dissolved Mercury Filtration Location	LAB					14-OCT-18	R4277474
Dissolved Mercury Filtration Location	LAB					15-OCT-18	R4278475
Mercury (Hg)-Dissolved	<0.000010		0.000010	mg/L	15-OCT-18	16-OCT-18	R4280190
L2170896-29 MW REF B1 D							
Sampled By: CLIENT on 20-SEP-18 @ 12:00							
Matrix: Marine H2O							
Alkalinity Species by Titration							
Alkalinity Spec by Titration (Seawater)							
Alkalinity, Bicarbonate (as CaCO3)	114		1.0	mg/L		02-OCT-18	R4257666
Alkalinity, Carbonate (as CaCO3)	<1.0		1.0	mg/L		02-OCT-18	R4257666
Alkalinity, Hydroxide (as CaCO3)	<1.0		1.0	mg/L		02-OCT-18	R4257666
Alkalinity, Total (as CaCO3)	114		1.0	mg/L		02-OCT-18	R4257666
Anions by Ion Chromatography (seawater)							
Bromide by IC (seawater)							
Bromide (Br)	56.4		5.0	mg/L		02-OCT-18	R4258739
Chloride by IC (seawater)							
Chloride (Cl)	16100		50	mg/L		02-OCT-18	R4258739
Fluoride by IC (seawater)							
Fluoride (F)	<1.0		1.0	mg/L		02-OCT-18	R4258739
Nitrate in Seawater by IC							
Nitrate (as N)	<0.50		0.50	mg/L		02-OCT-18	R4258739
Nitrite in Seawater by IC							
Nitrite (as N)	<0.10		0.10	mg/L		02-OCT-18	R4258739
Sulfate by IC (seawater)							
Sulfate (SO4)	2280		30	mg/L		02-OCT-18	R4258739
Dissolved ICPOES & HR-ICPMS in Seawater							
Diss. Metals in Seawater by HR-ICPMS							
Dissolved Metals Filtration Location	LAB					08-OCT-18	R4263895
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	08-OCT-18	19-OCT-18	R4288587
Antimony (Sb)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Arsenic (As)-Dissolved	<0.0020		0.0020	mg/L	08-OCT-18	19-OCT-18	R4288587
Barium (Ba)-Dissolved	0.0098		0.0010	mg/L	08-OCT-18	19-OCT-18	R4288587
Beryllium (Be)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Bismuth (Bi)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Boron (B)-Dissolved	4.21		0.10	mg/L	08-OCT-18	19-OCT-18	R4288587
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L	08-OCT-18	19-OCT-18	R4288587
Calcium (Ca)-Dissolved	312		1.0	mg/L	08-OCT-18	19-OCT-18	R4288587
Cesium (Cs)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Cobalt (Co)-Dissolved	<0.000050		0.000050	mg/L	08-OCT-18	19-OCT-18	R4288587
Copper (Cu)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Gallium (Ga)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	08-OCT-18	19-OCT-18	R4288587
Lead (Pb)-Dissolved	<0.00030		0.00030	mg/L	08-OCT-18	19-OCT-18	R4288587
Lithium (Li)-Dissolved	0.205		0.020	mg/L	08-OCT-18	19-OCT-18	R4288587
Magnesium (Mg)-Dissolved	970		1.0	mg/L	08-OCT-18	19-OCT-18	R4288587
Manganese (Mn)-Dissolved	0.00026		0.00020	mg/L	08-OCT-18	19-OCT-18	R4288587
Molybdenum (Mo)-Dissolved	0.0128		0.0020	mg/L	08-OCT-18	19-OCT-18	R4288587
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	08-OCT-18	19-OCT-18	R4288587

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-29 MW REF B1 D							
Sampled By: CLIENT on 20-SEP-18 @ 12:00							
Matrix: Marine H2O							
Diss. Metals in Seawater by HR-ICPMS							
Potassium (K)-Dissolved	321		20	mg/L	08-OCT-18	19-OCT-18	R4288587
Rhenium (Re)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Rubidium (Rb)-Dissolved	0.118		0.0050	mg/L	08-OCT-18	19-OCT-18	R4288587
Selenium (Se)-Dissolved	<0.0020		0.0020	mg/L	08-OCT-18	19-OCT-18	R4288587
Silicon (Si)-Dissolved	<1.0		1.0	mg/L	08-OCT-18	19-OCT-18	R4288587
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L	08-OCT-18	19-OCT-18	R4288587
Sodium (Na)-Dissolved	8680		20	mg/L	08-OCT-18	19-OCT-18	R4288587
Strontium (Sr)-Dissolved	5.40		0.050	mg/L	08-OCT-18	19-OCT-18	R4288587
Sulfur (S)-Dissolved	716		5.0	mg/L	08-OCT-18	19-OCT-18	R4288587
Tellurium (Te)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Thallium (Tl)-Dissolved	<0.000050		0.000050	mg/L	08-OCT-18	19-OCT-18	R4288587
Thorium (Th)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Tin (Sn)-Dissolved	<0.0010		0.0010	mg/L	08-OCT-18	19-OCT-18	R4288587
Titanium (Ti)-Dissolved	<0.0050		0.0050	mg/L	08-OCT-18	19-OCT-18	R4288587
Tungsten (W)-Dissolved	<0.0010		0.0010	mg/L	08-OCT-18	19-OCT-18	R4288587
Uranium (U)-Dissolved	0.00301		0.000050	mg/L	08-OCT-18	19-OCT-18	R4288587
Vanadium (V)-Dissolved	0.00120		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Yttrium (Y)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Zinc (Zn)-Dissolved	<0.0030		0.0030	mg/L	08-OCT-18	19-OCT-18	R4288587
Zirconium (Zr)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Hardness							
Hardness (as CaCO3)	4780		4.8	mg/L		19-OCT-18	
Total ICPOES & HR-ICPMS in Seawater							
Tot. Metals in Seawater by HR-ICPMS							
Aluminum (Al)-Total	0.0125		0.0050	mg/L		19-OCT-18	R4288587
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Arsenic (As)-Total	<0.0020		0.0020	mg/L		19-OCT-18	R4288587
Barium (Ba)-Total	0.0101		0.0010	mg/L		19-OCT-18	R4288587
Beryllium (Be)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Boron (B)-Total	4.10		0.10	mg/L		19-OCT-18	R4288587
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		19-OCT-18	R4288587
Calcium (Ca)-Total	334		1.0	mg/L		19-OCT-18	R4288587
Cesium (Cs)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Chromium (Cr)-Total	0.00051		0.00050	mg/L		19-OCT-18	R4288587
Cobalt (Co)-Total	<0.000050		0.000050	mg/L		19-OCT-18	R4288587
Copper (Cu)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Gallium (Ga)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Iron (Fe)-Total	0.028		0.010	mg/L		19-OCT-18	R4288587
Lead (Pb)-Total	<0.00030		0.00030	mg/L		19-OCT-18	R4288587
Lithium (Li)-Total	0.196		0.020	mg/L		19-OCT-18	R4288587
Magnesium (Mg)-Total	972		1.0	mg/L		19-OCT-18	R4288587
Manganese (Mn)-Total	0.00094		0.00020	mg/L		19-OCT-18	R4288587
Molybdenum (Mo)-Total	0.0127		0.0020	mg/L		19-OCT-18	R4288587
Nickel (Ni)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Phosphorus (P)-Total	<0.050		0.050	mg/L		19-OCT-18	R4288587
Potassium (K)-Total	333		1.0	mg/L		19-OCT-18	R4288587
Rhenium (Re)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Rubidium (Rb)-Total	0.115		0.0050	mg/L		19-OCT-18	R4288587
Selenium (Se)-Total	<0.0020		0.0020	mg/L		19-OCT-18	R4288587
Silicon (Si)-Total	<1.0		1.0	mg/L		19-OCT-18	R4288587

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-29 MW REF B1 D							
Sampled By: CLIENT on 20-SEP-18 @ 12:00							
Matrix: Marine H2O							
Tot. Metals in Seawater by HR-ICPMS							
Silver (Ag)-Total	<0.00010		0.00010	mg/L		19-OCT-18	R4288587
Sodium (Na)-Total	8670		1.0	mg/L		19-OCT-18	R4288587
Strontium (Sr)-Total	5.47		0.010	mg/L		19-OCT-18	R4288587
Sulfur (S)-Total	716		5.0	mg/L		19-OCT-18	R4288587
Tellurium (Te)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Thallium (Tl)-Total	<0.000050		0.000050	mg/L		19-OCT-18	R4288587
Thorium (Th)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Tin (Sn)-Total	<0.0010		0.0010	mg/L		19-OCT-18	R4288587
Titanium (Ti)-Total	<0.0050		0.0050	mg/L		19-OCT-18	R4288587
Tungsten (W)-Total	<0.0010		0.0010	mg/L		19-OCT-18	R4288587
Uranium (U)-Total	0.00294		0.000050	mg/L		19-OCT-18	R4288587
Vanadium (V)-Total	0.00129		0.00050	mg/L		19-OCT-18	R4288587
Yttrium (Y)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		19-OCT-18	R4288587
Zirconium (Zr)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		16-OCT-18	R4282102
Conductivity	46900		2.0	uS/cm		02-OCT-18	R4257666
Orthophosphate-Dissolved (as P)	0.0175		0.0010	mg/L		29-SEP-18	R4252115
Dissolved Organic Carbon	1.02		0.50	mg/L		02-OCT-18	R4257979
Silicate (as SiO2)	0.308		0.010	mg/L		03-OCT-18	R4258600
Total Kjeldahl Nitrogen	0.133		0.050	mg/L	10-OCT-18	11-OCT-18	R4272089
Total Organic Carbon	1.11		0.50	mg/L		04-OCT-18	R4263002
Total Dissolved Solids	35500		80	mg/L		29-SEP-18	R4253115
Mercury (Hg)-Total	<0.000010		0.000010	mg/L		06-OCT-18	R4263241
Phosphorus (P)-Total	0.0253		0.0040	mg/L		01-OCT-18	R4255689
Total Suspended Solids	2.9		2.0	mg/L		29-SEP-18	R4253121
pH	7.98		0.10	pH		02-OCT-18	R4257666
Salinity	31.0		1.0	psu		03-OCT-18	
Diss. Mercury in Seawater by CVAFS							
Dissolved Mercury Filtration Location	LAB					15-OCT-18	R4278475
Dissolved Mercury Filtration Location	LAB					14-OCT-18	R4277474
Dissolved Mercury Filtration Location	LAB					11-OCT-18	R4269591
Mercury (Hg)-Dissolved	<0.000010		0.000010	mg/L	15-OCT-18	16-OCT-18	R4280190
L2170896-30 MW REF B1 S							
Sampled By: CLIENT on 20-SEP-18 @ 12:00							
Matrix: Marine H2O							
Alkalinity Species by Titration							
Alkalinity Spec by Titration (Seawater)							
Alkalinity, Bicarbonate (as CaCO3)	115		1.0	mg/L		02-OCT-18	R4257666
Alkalinity, Carbonate (as CaCO3)	<1.0		1.0	mg/L		02-OCT-18	R4257666
Alkalinity, Hydroxide (as CaCO3)	<1.0		1.0	mg/L		02-OCT-18	R4257666
Alkalinity, Total (as CaCO3)	115		1.0	mg/L		02-OCT-18	R4257666
Anions by Ion Chromatography (seawater)							
Bromide by IC (seawater)							
Bromide (Br)	58.6		5.0	mg/L		02-OCT-18	R4258739
Chloride by IC (seawater)							
Chloride (Cl)	17000		50	mg/L		02-OCT-18	R4258739
Fluoride by IC (seawater)							
Fluoride (F)	<1.0		1.0	mg/L		02-OCT-18	R4258739

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-30 MW REF B1 S							
Sampled By: CLIENT on 20-SEP-18 @ 12:00							
Matrix: Marine H2O							
Nitrate in Seawater by IC							
Nitrate (as N)	<0.50		0.50	mg/L		02-OCT-18	R4258739
Nitrite in Seawater by IC							
Nitrite (as N)	<0.10		0.10	mg/L		02-OCT-18	R4258739
Sulfate by IC (seawater)							
Sulfate (SO4)	2400		30	mg/L		02-OCT-18	R4258739
Dissolved ICPOES & HR-ICPMS in Seawater							
Diss. Metals in Seawater by HR-ICPMS							
Dissolved Metals Filtration Location	LAB					08-OCT-18	R4263895
Aluminum (Al)-Dissolved	<0.0050		0.0050	mg/L	08-OCT-18	19-OCT-18	R4288587
Antimony (Sb)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Arsenic (As)-Dissolved	<0.0020		0.0020	mg/L	08-OCT-18	19-OCT-18	R4288587
Barium (Ba)-Dissolved	0.0102		0.0010	mg/L	08-OCT-18	19-OCT-18	R4288587
Beryllium (Be)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Bismuth (Bi)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Boron (B)-Dissolved	3.89		0.10	mg/L	08-OCT-18	19-OCT-18	R4288587
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L	08-OCT-18	19-OCT-18	R4288587
Calcium (Ca)-Dissolved	331		1.0	mg/L	08-OCT-18	19-OCT-18	R4288587
Cesium (Cs)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Chromium (Cr)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Cobalt (Co)-Dissolved	<0.000050		0.000050	mg/L	08-OCT-18	19-OCT-18	R4288587
Copper (Cu)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Gallium (Ga)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	08-OCT-18	19-OCT-18	R4288587
Lead (Pb)-Dissolved	<0.00030		0.00030	mg/L	08-OCT-18	19-OCT-18	R4288587
Lithium (Li)-Dissolved	0.192		0.020	mg/L	08-OCT-18	19-OCT-18	R4288587
Magnesium (Mg)-Dissolved	978		1.0	mg/L	08-OCT-18	19-OCT-18	R4288587
Manganese (Mn)-Dissolved	0.00032		0.00020	mg/L	08-OCT-18	19-OCT-18	R4288587
Molybdenum (Mo)-Dissolved	0.0120		0.0020	mg/L	08-OCT-18	19-OCT-18	R4288587
Nickel (Ni)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	08-OCT-18	19-OCT-18	R4288587
Potassium (K)-Dissolved	322		20	mg/L	08-OCT-18	19-OCT-18	R4288587
Rhenium (Re)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Rubidium (Rb)-Dissolved	0.111		0.0050	mg/L	08-OCT-18	19-OCT-18	R4288587
Selenium (Se)-Dissolved	<0.0020		0.0020	mg/L	08-OCT-18	19-OCT-18	R4288587
Silicon (Si)-Dissolved	<1.0		1.0	mg/L	08-OCT-18	19-OCT-18	R4288587
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L	08-OCT-18	19-OCT-18	R4288587
Sodium (Na)-Dissolved	8620		20	mg/L	08-OCT-18	19-OCT-18	R4288587
Strontium (Sr)-Dissolved	5.45		0.050	mg/L	08-OCT-18	19-OCT-18	R4288587
Sulfur (S)-Dissolved	721		5.0	mg/L	08-OCT-18	19-OCT-18	R4288587
Tellurium (Te)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Thallium (Tl)-Dissolved	<0.000050		0.000050	mg/L	08-OCT-18	19-OCT-18	R4288587
Thorium (Th)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Tin (Sn)-Dissolved	<0.0010		0.0010	mg/L	08-OCT-18	19-OCT-18	R4288587
Titanium (Ti)-Dissolved	<0.0050		0.0050	mg/L	08-OCT-18	19-OCT-18	R4288587
Tungsten (W)-Dissolved	<0.0010		0.0010	mg/L	08-OCT-18	19-OCT-18	R4288587
Uranium (U)-Dissolved	0.00295		0.000050	mg/L	08-OCT-18	19-OCT-18	R4288587
Vanadium (V)-Dissolved	0.00128		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Yttrium (Y)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Zinc (Zn)-Dissolved	<0.0030		0.0030	mg/L	08-OCT-18	19-OCT-18	R4288587
Zirconium (Zr)-Dissolved	<0.00050		0.00050	mg/L	08-OCT-18	19-OCT-18	R4288587
Hardness							
Hardness (as CaCO3)	4860		4.8	mg/L		19-OCT-18	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-30 MW REF B1 S							
Sampled By: CLIENT on 20-SEP-18 @ 12:00							
Matrix: Marine H2O							
Total ICPOES & HR-ICPMS in Seawater							
Tot. Metals in Seawater by HR-ICPMS							
Aluminum (Al)-Total	0.0137		0.0050	mg/L		19-OCT-18	R4288587
Antimony (Sb)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Arsenic (As)-Total	<0.0020		0.0020	mg/L		19-OCT-18	R4288587
Barium (Ba)-Total	0.0099		0.0010	mg/L		19-OCT-18	R4288587
Beryllium (Be)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Bismuth (Bi)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Boron (B)-Total	3.83		0.10	mg/L		19-OCT-18	R4288587
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		19-OCT-18	R4288587
Calcium (Ca)-Total	339		1.0	mg/L		19-OCT-18	R4288587
Cesium (Cs)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Chromium (Cr)-Total	0.00085		0.00050	mg/L		19-OCT-18	R4288587
Cobalt (Co)-Total	<0.000050		0.000050	mg/L		19-OCT-18	R4288587
Copper (Cu)-Total	0.00061		0.00050	mg/L		19-OCT-18	R4288587
Gallium (Ga)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Iron (Fe)-Total	0.031		0.010	mg/L		19-OCT-18	R4288587
Lead (Pb)-Total	<0.00030		0.00030	mg/L		19-OCT-18	R4288587
Lithium (Li)-Total	0.193		0.020	mg/L		19-OCT-18	R4288587
Magnesium (Mg)-Total	976		1.0	mg/L		19-OCT-18	R4288587
Manganese (Mn)-Total	0.00102		0.00020	mg/L		19-OCT-18	R4288587
Molybdenum (Mo)-Total	0.0119		0.0020	mg/L		19-OCT-18	R4288587
Nickel (Ni)-Total	0.00064		0.00050	mg/L		19-OCT-18	R4288587
Phosphorus (P)-Total	<0.050		0.050	mg/L		19-OCT-18	R4288587
Potassium (K)-Total	335		1.0	mg/L		19-OCT-18	R4288587
Rhenium (Re)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Rubidium (Rb)-Total	0.110		0.0050	mg/L		19-OCT-18	R4288587
Selenium (Se)-Total	<0.0020		0.0020	mg/L		19-OCT-18	R4288587
Silicon (Si)-Total	<1.0		1.0	mg/L		19-OCT-18	R4288587
Silver (Ag)-Total	<0.00010		0.00010	mg/L		19-OCT-18	R4288587
Sodium (Na)-Total	8640		1.0	mg/L		19-OCT-18	R4288587
Strontium (Sr)-Total	5.60		0.010	mg/L		19-OCT-18	R4288587
Sulfur (S)-Total	719		5.0	mg/L		19-OCT-18	R4288587
Tellurium (Te)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Thallium (Tl)-Total	<0.000050		0.000050	mg/L		19-OCT-18	R4288587
Thorium (Th)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Tin (Sn)-Total	<0.0010		0.0010	mg/L		19-OCT-18	R4288587
Titanium (Ti)-Total	<0.0050		0.0050	mg/L		19-OCT-18	R4288587
Tungsten (W)-Total	<0.0010		0.0010	mg/L		19-OCT-18	R4288587
Uranium (U)-Total	0.00295		0.000050	mg/L		19-OCT-18	R4288587
Vanadium (V)-Total	0.00129		0.00050	mg/L		19-OCT-18	R4288587
Yttrium (Y)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Zinc (Zn)-Total	<0.0030		0.0030	mg/L		19-OCT-18	R4288587
Zirconium (Zr)-Total	<0.00050		0.00050	mg/L		19-OCT-18	R4288587
Miscellaneous Parameters							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		16-OCT-18	R4282102
Conductivity	47300		2.0	uS/cm		02-OCT-18	R4257666
Orthophosphate-Dissolved (as P)	0.0171		0.0010	mg/L		29-SEP-18	R4252115
Dissolved Organic Carbon	0.97		0.50	mg/L		02-OCT-18	R4257979
Silicate (as SiO2)	0.305		0.010	mg/L		03-OCT-18	R4258600
Total Kjeldahl Nitrogen	0.136		0.050	mg/L	10-OCT-18	11-OCT-18	R4272089
Total Organic Carbon	1.15		0.50	mg/L		02-OCT-18	R4257978

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2170896-30 MW REF B1 S							
Sampled By: CLIENT on 20-SEP-18 @ 12:00							
Matrix: Marine H2O							
Total Dissolved Solids	35700		80	mg/L		29-SEP-18	R4253115
Mercury (Hg)-Total	<0.000010		0.000010	mg/L		06-OCT-18	R4263241
Phosphorus (P)-Total	0.0251		0.0040	mg/L		01-OCT-18	R4255689
Total Suspended Solids	2.5		2.0	mg/L		29-SEP-18	R4253121
pH	8.00		0.10	pH		02-OCT-18	R4257666
Salinity	31.3		1.0	psu		03-OCT-18	
Diss. Mercury in Seawater by CVAFS							
Dissolved Mercury Filtration Location	LAB					14-OCT-18	R4277474
Dissolved Mercury Filtration Location	LAB					15-OCT-18	R4278475
Dissolved Mercury Filtration Location	LAB					11-OCT-18	R4269591
Mercury (Hg)-Dissolved	<0.000010		0.000010	mg/L	15-OCT-18	16-OCT-18	R4280190

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TITR-VA	Seawater	Alkalinity Spec by Titration (Seawater)	APHA 2320 Alkalinity
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.			
ANIONS-C-BR-IC-VA	Seawater	Bromide by IC (seawater)	EPA 300.1 (mod)
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-C-CL-IC-VA	Seawater	Chloride by IC (seawater)	EPA 300.1 (mod)
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-C-F-IC-VA	Seawater	Fluoride by IC (seawater)	EPA 300.1 (mod)
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
ANIONS-C-NO2-IC-VA	Seawater	Nitrite in Seawater by IC	EPA 300.1 (mod)
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrite is detected by UV absorbance.			
ANIONS-C-NO3-IC-VA	Seawater	Nitrate in Seawater by IC	EPA 300.1 (mod)
This analysis is carried out using procedures adapted from EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography". Nitrate is detected by UV absorbance.			
ANIONS-C-SO4-IC-VA	Seawater	Sulfate by IC (seawater)	EPA 300.1 (mod)
This analysis is carried out using procedures adapted from APHA Method 4110 B. "Ion Chromatography with Chemical Suppression of Eluent Conductivity" and EPA Method 300.0 "Determination of Inorganic Anions by Ion Chromatography".			
C-TIC-PCT-SK	Soil	Total Inorganic Carbon in Soil	CSSS (2008) P216-217
A known quantity of acetic acid is consumed by reaction with carbonates in the soil. The pH of the resulting solution is measured and compared against a standard curve relating pH to weight of carbonate.			
C-TOC-CALC-SK	Soil	Total Organic Carbon Calculation	CSSS (2008) 21.2
Total Organic Carbon (TOC) is calculated by the difference between total carbon (TC) and total inorganic carbon. (TIC)			
C-TOT-LECO-SK	Soil	Total Carbon by combustion method	CSSS (2008) 21.2
The sample is ignited in a combustion analyzer where carbon in the reduced CO2 gas is determined using a thermal conductivity detector.			
CARBONS-C-DOC-VA	Seawater	DOC by combustion (seawater)	APHA 5310B TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis.			
CARBONS-C-TOC-VA	Seawater	TOC by combustion (seawater)	APHA 5310B TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
EC-C-PCT-VA	Seawater	Conductivity (Automated) (seawater)	APHA 2510 Auto. Conduc.
This analysis is carried out using procedures adapted from APHA Method 2510 "Conductivity". Conductivity is determined using a conductivity electrode.			
HARDNESS-CALC-VA	Seawater	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-200.2-CVAA-SK	Soil	Mercury in Soil by CVAAS	EPA 200.2/1631E (mod)
Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS.			
HG-DIS-C-CVAFS-VA	Seawater	Diss. Mercury in Seawater by CVAFS	PUGET SOUND PROTOCOLS, EPA 245.7
This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The procedures may involve preliminary sample treatment by filtration (EPA Method 3005A) and involves a cold-oxidation of the acidified seawater sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry or atomic absorption spectrophotometry (EPA Method 245.7).			
HG-TOT-C-CVAFS-VA	Seawater	Total Mercury in Seawater by CVAFS	PUGET SOUND PROTOCOLS, EPA 245.7
This analysis is carried out using procedures adapted from "Recommended Guidelines for Measuring Metals in Puget Sound Marine Water, Sediment, and Tissue Samples" prepared for the United States Environmental Protection Agency and the Puget Sound Water Quality Authority, 1995. The			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
procedure involves a cold-oxidation of the acidified seawater 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).			
IC-CACO3-CALC-SK	Soil	Inorganic Carbon as CaCO3 Equivalent	Calculation
MET-200.2-CCMS-SK	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)
Soil/sediment is dried, disaggregated, and sieved (2 mm). Strong Acid Leachable Metals in the <2mm fraction are solubilized by heated digestion with nitric and hydrochloric acids. Instrumental analysis is by Collision / Reaction Cell ICPMS. Limitations: This method is intended to liberate environmentally available metals. Silicate minerals are not solubilized. Some metals may be only partially recovered (matrix dependent), including Al, Ba, Be, Cr, S, Sr, Ti, Tl, V, W, and Zr. Elemental Sulfur may be poorly recovered by this method. Volatile forms of sulfur (e.g. sulfide, H2S) may be excluded if lost during sampling, storage, or digestion.			
MET-D-L-HRMS-VA	Seawater	Diss. Metals in Seawater by HR-ICPMS	EPA 200.8
Trace metals in seawater are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) based on US EPA Method 200.8, (Revision 5.5). The procedures may involve laboratory sample filtration based on APHA Method 3030B.			
MET-T-L-HRMS-VA	Seawater	Tot. Metals in Seawater by HR-ICPMS	EPA 200.8
Trace metals in seawater are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) based on US EPA Method 200.8, (Revision 5.5). The procedures may involve preliminary sample treatment by acid digestion based on APHA Method 3030E.			
N-TOTKJ-COL-SK	Soil	Total Kjeldahl Nitrogen	CSSS (2008) 22.2.3
The soil is digested with sulfuric acid in the presence of CuSO4 and K2SO4 catalysts. Ammonia in the soil extract is determined colrimetrically at 660 nm.			
NH3-F-VA	Seawater	Ammonia in Seawater by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
P-T-COL-VA	Seawater	Total P in Seawater by Colour	APHA 4500-P Phosphorus
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorous is determined colourimetrically after persulphate digestion of the sample.			
PH-C-PCT-VA	Seawater	pH by Meter (Automated) (seawater)	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.			
PO4-DO-COL-VA	Seawater	D-Orthophosphate in Seawater by Colour	APHA 4500-P Phosphorus
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.			
SALINITY-CALC-VA	Seawater	Salinity by conductivity meter	APHA 2520B
Salinity is determined by the APHA 2520B Electrical Conductivity Method. Salinity is a unitless parameter that is roughly equivalent to grams per Litre. ALS applies the unit of psu (practical salinity unit) to indicate that salinity values are derived from the Practical Salinity Scale.			
SIO2-L-COL-VA	Seawater	Low Level Silicate by Colourimetric	APHA 4500-SiO2 E.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO2 E. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
SPECIAL REQUEST-SK	Misc.	Special Request Sask Lab	SEE SUBLET LAB RESULTS
TDS-VA	Seawater	Total Dissolved Solids by Gravimetric	APHA 2540 Gravimetric
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.			
TKN-C-F-VA	Seawater	TKN in Seawater by Fluorescence	APHA 4500-NORG D.
This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Total Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection.			
TSS-C-VA	Seawater	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 (TSS) is determined by filtering a sample through a glass fibre filter. TSS is determined by drying the filter at 104 degrees celsius.			

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

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
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

14-452766 14-452767 14-452768

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

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

Quality Control Report

Client: Agnico-Eagle - Meliadine Gold Project
PO Box 99
Rankin Inlet NU X0C 0G0
Contact: Jennifer Brown

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-TIC-PCT-SK	**Soil**							
Batch R4270928								
WG2893808-1 DUP		**L2170896-20**						
Inorganic Carbon		0.087	0.088		%	1.4	20	11-OCT-18
WG2893808-2 LCS								
Inorganic Carbon			95.8		%		80-120	11-OCT-18
WG2893808-3 MB								
Inorganic Carbon			<0.050		%		0.05	11-OCT-18
Batch R4271167								
WG2893800-2 LCS								
Inorganic Carbon			95.4		%		80-120	11-OCT-18
WG2893800-3 MB								
Inorganic Carbon			<0.050		%		0.05	11-OCT-18
C-TOT-LECO-SK	**Soil**							
Batch R4263371								
WG2894570-1 DUP		**L2170896-10**						
Total Carbon by Combustion		0.56	0.55		%	2.0	20	05-OCT-18
WG2894570-2 IRM		**08-109_SOIL**						
Total Carbon by Combustion			93.7		%		80-120	05-OCT-18
WG2894570-4 LCS		**SULFADIAZINE**						
Total Carbon by Combustion			100.2		%		90-110	05-OCT-18
WG2894570-3 MB								
Total Carbon by Combustion			<0.05		%		0.05	05-OCT-18
Batch R4270350								
WG2895151-2 IRM		**08-109_SOIL**						
Total Carbon by Combustion			93.5		%		80-120	10-OCT-18
WG2895151-4 LCS		**SULFADIAZINE**						
Total Carbon by Combustion			100.7		%		90-110	10-OCT-18
WG2895151-3 MB								
Total Carbon by Combustion			<0.05		%		0.05	10-OCT-18
HG-200.2-CVAA-SK	**Soil**							
Batch R4268284								
WG2894269-3 CRM		**TILL-1**						
Mercury (Hg)			93.0		%		70-130	09-OCT-18
WG2894269-2 DUP		**L2170896-4**						
Mercury (Hg)		0.0101	0.0100		mg/kg	0.9	40	09-OCT-18
WG2894269-4 LCS								
Mercury (Hg)			97.2		%		80-120	09-OCT-18
WG2894269-1 MB								
Mercury (Hg)			<0.0050		mg/kg		0.005	09-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-200.2-CVAA-SK	**Soil**							
Batch R4276967								
WG2894273-3 CRM		**TILL-1**						
Mercury (Hg)			93.3		%		70-130	12-OCT-18
WG2894273-2 DUP		**L2170896-21**						
Mercury (Hg)		0.0133	0.0125		mg/kg	6.0	40	12-OCT-18
WG2894273-4 LCS								
Mercury (Hg)			98.9		%		80-120	12-OCT-18
WG2894273-1 MB								
Mercury (Hg)			<0.0050		mg/kg		0.005	12-OCT-18
MET-200.2-CCMS-SK	**Soil**							
Batch R4268336								
WG2894269-3 CRM		**TILL-1**						
Aluminum (Al)			94.1		%		70-130	10-OCT-18
Antimony (Sb)			99.6		%		70-130	10-OCT-18
Arsenic (As)			92.3		%		70-130	10-OCT-18
Barium (Ba)			99.8		%		70-130	10-OCT-18
Beryllium (Be)			97.2		%		70-130	10-OCT-18
Boron (B)			2.9		mg/kg		0-8.2	10-OCT-18
Bismuth (Bi)			88.9		%		70-130	10-OCT-18
Cadmium (Cd)			89.6		%		70-130	10-OCT-18
Calcium (Ca)			95.0		%		70-130	10-OCT-18
Chromium (Cr)			92.6		%		70-130	10-OCT-18
Cobalt (Co)			87.6		%		70-130	10-OCT-18
Copper (Cu)			91.7		%		70-130	10-OCT-18
Iron (Fe)			92.1		%		70-130	10-OCT-18
Lead (Pb)			93.6		%		70-130	10-OCT-18
Lithium (Li)			91.6		%		70-130	10-OCT-18
Magnesium (Mg)			86.8		%		70-130	10-OCT-18
Manganese (Mn)			90.5		%		70-130	10-OCT-18
Molybdenum (Mo)			92.4		%		70-130	10-OCT-18
Nickel (Ni)			90.7		%		70-130	10-OCT-18
Phosphorus (P)			95.7		%		70-130	10-OCT-18
Potassium (K)			108.6		%		70-130	10-OCT-18
Selenium (Se)			0.27		mg/kg		0.11-0.51	10-OCT-18
Silver (Ag)			0.23		mg/kg		0.13-0.33	10-OCT-18
Sodium (Na)			105.5		%		70-130	10-OCT-18
Strontium (Sr)			91.2		%		70-130	10-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-SK	**Soil**							
Batch R4268336								
WG2894269-3 CRM		**TILL-1**						
Thallium (Tl)			0.113		mg/kg		0.077-0.18	10-OCT-18
Tin (Sn)			0.9		mg/kg		0-3.1	10-OCT-18
Titanium (Ti)			81.3		%		70-130	10-OCT-18
Tungsten (W)			0.13		mg/kg		0-0.66	10-OCT-18
Uranium (U)			88.0		%		70-130	10-OCT-18
Vanadium (V)			90.3		%		70-130	10-OCT-18
Zinc (Zn)			90.4		%		70-130	10-OCT-18
Zirconium (Zr)			1.0		mg/kg		0-1.8	10-OCT-18
WG2894269-2 DUP		**L2170896-4**						
Aluminum (Al)		6860	8410		mg/kg	20	40	10-OCT-18
Antimony (Sb)		<0.10	<0.10	RPD-NA	mg/kg	N/A	30	10-OCT-18
Arsenic (As)		5.44	6.23		mg/kg	14	30	10-OCT-18
Barium (Ba)		43.7	51.7		mg/kg	17	40	10-OCT-18
Beryllium (Be)		0.14	0.15		mg/kg	1.5	30	10-OCT-18
Boron (B)		13.5	14.2		mg/kg	4.8	30	10-OCT-18
Bismuth (Bi)		<0.20	<0.20	RPD-NA	mg/kg	N/A	30	10-OCT-18
Cadmium (Cd)		<0.020	<0.020	RPD-NA	mg/kg	N/A	30	10-OCT-18
Calcium (Ca)		5430	5680		mg/kg	4.4	30	10-OCT-18
Chromium (Cr)		36.3	42.7		mg/kg	16	30	10-OCT-18
Cobalt (Co)		4.05	4.74		mg/kg	16	30	10-OCT-18
Copper (Cu)		7.91	9.07		mg/kg	14	30	10-OCT-18
Iron (Fe)		13200	14400		mg/kg	9.2	30	10-OCT-18
Lead (Pb)		3.21	3.30		mg/kg	2.9	40	10-OCT-18
Lithium (Li)		10.9	11.5		mg/kg	5.9	30	10-OCT-18
Magnesium (Mg)		6560	7490		mg/kg	13	30	10-OCT-18
Manganese (Mn)		137	160		mg/kg	16	30	10-OCT-18
Molybdenum (Mo)		0.58	0.58		mg/kg	0.0	40	10-OCT-18
Nickel (Ni)		15.0	17.2		mg/kg	14	30	10-OCT-18
Phosphorus (P)		857	1030		mg/kg	19	30	10-OCT-18
Potassium (K)		2070	2370		mg/kg	14	40	10-OCT-18
Selenium (Se)		0.21	0.22		mg/kg	1.0	30	10-OCT-18
Silver (Ag)		<0.10	<0.10	RPD-NA	mg/kg	N/A	40	10-OCT-18
Sodium (Na)		6210	6960		mg/kg	11	40	10-OCT-18
Strontium (Sr)		24.7	26.3		mg/kg	6.1	40	10-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-SK	**Soil**							
Batch R4268336								
WG2894269-2 DUP		**L2170896-4**						
Sulfur (S)		<1000	<1000	RPD-NA	mg/kg	N/A	30	10-OCT-18
Thallium (Tl)		0.083	0.083		mg/kg	0.1	30	10-OCT-18
Tin (Sn)		1.2	<1.0	RPD-NA	mg/kg	N/A	40	10-OCT-18
Titanium (Ti)		510	650		mg/kg	24	40	10-OCT-18
Tungsten (W)		<0.50	<0.50	RPD-NA	mg/kg	N/A	30	10-OCT-18
Uranium (U)		0.702	0.752		mg/kg	6.9	30	10-OCT-18
Vanadium (V)		29.4	34.5		mg/kg	16	30	10-OCT-18
Zinc (Zn)		24.3	27.3		mg/kg	12	30	10-OCT-18
Zirconium (Zr)		3.9	4.4		mg/kg	11	30	10-OCT-18
WG2894269-4 LCS								
Aluminum (Al)			106.8		%		80-120	10-OCT-18
Antimony (Sb)			105.6		%		80-120	10-OCT-18
Arsenic (As)			104.0		%		80-120	10-OCT-18
Barium (Ba)			108.9		%		80-120	10-OCT-18
Beryllium (Be)			101.4		%		80-120	10-OCT-18
Boron (B)			95.8		%		80-120	10-OCT-18
Bismuth (Bi)			91.3		%		80-120	10-OCT-18
Cadmium (Cd)			95.2		%		80-120	10-OCT-18
Calcium (Ca)			102.2		%		80-120	10-OCT-18
Chromium (Cr)			105.8		%		80-120	10-OCT-18
Cobalt (Co)			96.9		%		80-120	10-OCT-18
Copper (Cu)			99.9		%		80-120	10-OCT-18
Iron (Fe)			112.2		%		80-120	10-OCT-18
Lead (Pb)			94.4		%		80-120	10-OCT-18
Lithium (Li)			101.6		%		80-120	10-OCT-18
Magnesium (Mg)			98.8		%		80-120	10-OCT-18
Manganese (Mn)			104.2		%		80-120	10-OCT-18
Molybdenum (Mo)			97.8		%		80-120	10-OCT-18
Nickel (Ni)			100.7		%		80-120	10-OCT-18
Phosphorus (P)			108.2		%		80-120	10-OCT-18
Potassium (K)			104.2		%		80-120	10-OCT-18
Selenium (Se)			104.8		%		80-120	10-OCT-18
Silver (Ag)			99.2		%		80-120	10-OCT-18
Sodium (Na)			99.8		%		80-120	10-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-SK	**Soil**							
Batch R4268336								
WG2894269-4 LCS								
Strontium (Sr)			103.8		%		80-120	10-OCT-18
Sulfur (S)			98.6		%		80-120	10-OCT-18
Thallium (Tl)			92.5		%		80-120	10-OCT-18
Tin (Sn)			95.9		%		80-120	10-OCT-18
Titanium (Ti)			100.7		%		80-120	10-OCT-18
Tungsten (W)			96.3		%		80-120	10-OCT-18
Uranium (U)			95.8		%		80-120	10-OCT-18
Vanadium (V)			105.5		%		80-120	10-OCT-18
Zinc (Zn)			106.5		%		80-120	10-OCT-18
Zirconium (Zr)			100.5		%		80-120	10-OCT-18
WG2894269-1 MB								
Aluminum (Al)			<50		mg/kg		50	10-OCT-18
Antimony (Sb)			<0.10		mg/kg		0.1	10-OCT-18
Arsenic (As)			<0.10		mg/kg		0.1	10-OCT-18
Barium (Ba)			<0.50		mg/kg		0.5	10-OCT-18
Beryllium (Be)			<0.10		mg/kg		0.1	10-OCT-18
Boron (B)			<5.0		mg/kg		5	10-OCT-18
Bismuth (Bi)			<0.20		mg/kg		0.2	10-OCT-18
Cadmium (Cd)			<0.020		mg/kg		0.02	10-OCT-18
Calcium (Ca)			<50		mg/kg		50	10-OCT-18
Chromium (Cr)			<0.50		mg/kg		0.5	10-OCT-18
Cobalt (Co)			<0.10		mg/kg		0.1	10-OCT-18
Copper (Cu)			<0.50		mg/kg		0.5	10-OCT-18
Iron (Fe)			<50		mg/kg		50	10-OCT-18
Lead (Pb)			<0.50		mg/kg		0.5	10-OCT-18
Lithium (Li)			<2.0		mg/kg		2	10-OCT-18
Magnesium (Mg)			<20		mg/kg		20	10-OCT-18
Manganese (Mn)			<1.0		mg/kg		1	10-OCT-18
Molybdenum (Mo)			<0.10		mg/kg		0.1	10-OCT-18
Nickel (Ni)			<0.50		mg/kg		0.5	10-OCT-18
Phosphorus (P)			<50		mg/kg		50	10-OCT-18
Potassium (K)			<100		mg/kg		100	10-OCT-18
Selenium (Se)			<0.20		mg/kg		0.2	10-OCT-18
Silver (Ag)			<0.10		mg/kg		0.1	10-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-SK	**Soil**							
Batch R4268336								
WG2894269-1 MB								
Sodium (Na)			<50		mg/kg		50	10-OCT-18
Strontium (Sr)			<0.50		mg/kg		0.5	10-OCT-18
Sulfur (S)			<1000		mg/kg		1000	10-OCT-18
Thallium (Tl)			<0.050		mg/kg		0.05	10-OCT-18
Tin (Sn)			<1.0		mg/kg		1	10-OCT-18
Titanium (Ti)			<1.0		mg/kg		1	10-OCT-18
Tungsten (W)			<0.50		mg/kg		0.5	10-OCT-18
Uranium (U)			<0.050		mg/kg		0.05	10-OCT-18
Vanadium (V)			<0.20		mg/kg		0.2	10-OCT-18
Zinc (Zn)			<2.0		mg/kg		2	10-OCT-18
Zirconium (Zr)			<1.0		mg/kg		1	10-OCT-18
Batch R4278629								
WG2894273-3 CRM		**TILL-1**						
Aluminum (Al)			86.9		%		70-130	15-OCT-18
Antimony (Sb)			99.8		%		70-130	15-OCT-18
Arsenic (As)			92.0		%		70-130	15-OCT-18
Barium (Ba)			89.2		%		70-130	15-OCT-18
Beryllium (Be)			97.3		%		70-130	15-OCT-18
Boron (B)			2.5		mg/kg		0-8.2	15-OCT-18
Bismuth (Bi)			95.9		%		70-130	15-OCT-18
Cadmium (Cd)			87.4		%		70-130	15-OCT-18
Calcium (Ca)			93.7		%		70-130	15-OCT-18
Chromium (Cr)			85.5		%		70-130	15-OCT-18
Cobalt (Co)			84.7		%		70-130	15-OCT-18
Copper (Cu)			90.7		%		70-130	15-OCT-18
Iron (Fe)			88.2		%		70-130	15-OCT-18
Lead (Pb)			96.3		%		70-130	15-OCT-18
Lithium (Li)			98.7		%		70-130	15-OCT-18
Magnesium (Mg)			85.6		%		70-130	15-OCT-18
Manganese (Mn)			91.3		%		70-130	15-OCT-18
Molybdenum (Mo)			92.6		%		70-130	15-OCT-18
Nickel (Ni)			87.9		%		70-130	15-OCT-18
Phosphorus (P)			87.9		%		70-130	15-OCT-18
Potassium (K)			85.2		%		70-130	15-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-SK	**Soil**							
Batch R4278629								
WG2894273-3 CRM		**TILL-1**						
Selenium (Se)			0.30		mg/kg		0.11-0.51	15-OCT-18
Silver (Ag)			0.24		mg/kg		0.13-0.33	15-OCT-18
Sodium (Na)			84.2		%		70-130	15-OCT-18
Strontium (Sr)			88.9		%		70-130	15-OCT-18
Thallium (Tl)			0.118		mg/kg		0.077-0.18	15-OCT-18
Tin (Sn)			0.8		mg/kg		0-3.1	15-OCT-18
Titanium (Ti)			72.8		%		70-130	15-OCT-18
Tungsten (W)			0.12		mg/kg		0-0.66	15-OCT-18
Uranium (U)			94.6		%		70-130	15-OCT-18
Vanadium (V)			86.0		%		70-130	15-OCT-18
Zinc (Zn)			89.7		%		70-130	15-OCT-18
Zirconium (Zr)			1.1		mg/kg		0-1.8	15-OCT-18
WG2894273-2 DUP		**L2170896-21**						
Aluminum (Al)		6740	6920		mg/kg	2.7	40	15-OCT-18
Antimony (Sb)		<0.10	<0.10	RPD-NA	mg/kg	N/A	30	15-OCT-18
Arsenic (As)		5.06	4.90		mg/kg	3.1	30	15-OCT-18
Barium (Ba)		38.5	36.6		mg/kg	5.1	40	15-OCT-18
Beryllium (Be)		0.15	0.15		mg/kg	1.2	30	15-OCT-18
Boron (B)		16.9	16.3		mg/kg	3.2	30	15-OCT-18
Bismuth (Bi)		<0.20	<0.20	RPD-NA	mg/kg	N/A	30	15-OCT-18
Cadmium (Cd)		<0.020	<0.020	RPD-NA	mg/kg	N/A	30	15-OCT-18
Calcium (Ca)		5850	5760		mg/kg	1.6	30	15-OCT-18
Chromium (Cr)		29.4	28.5		mg/kg	3.2	30	15-OCT-18
Cobalt (Co)		3.80	3.69		mg/kg	3.1	30	15-OCT-18
Copper (Cu)		6.72	6.39		mg/kg	5.1	30	15-OCT-18
Iron (Fe)		12600	12100		mg/kg	3.8	30	15-OCT-18
Lead (Pb)		3.34	3.24		mg/kg	2.9	40	15-OCT-18
Lithium (Li)		10.9	10.7		mg/kg	1.3	30	15-OCT-18
Magnesium (Mg)		6200	6150		mg/kg	0.7	30	15-OCT-18
Manganese (Mn)		134	131		mg/kg	2.5	30	15-OCT-18
Molybdenum (Mo)		0.66	0.67		mg/kg	0.8	40	15-OCT-18
Nickel (Ni)		13.3	12.2		mg/kg	8.5	30	15-OCT-18
Phosphorus (P)		834	783		mg/kg	6.3	30	15-OCT-18
Potassium (K)		2090	2030		mg/kg	2.9	40	15-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-SK	**Soil**							
Batch R4278629								
WG2894273-2 DUP		**L2170896-21**						
Selenium (Se)		0.21	<0.20	RPD-NA	mg/kg	N/A	30	15-OCT-18
Silver (Ag)		<0.10	<0.10	RPD-NA	mg/kg	N/A	40	15-OCT-18
Sodium (Na)		7050	6200		mg/kg	13	40	15-OCT-18
Strontium (Sr)		25.4	24.3		mg/kg	4.6	40	15-OCT-18
Sulfur (S)		<1000	<1000	RPD-NA	mg/kg	N/A	30	15-OCT-18
Thallium (Tl)		0.089	0.082		mg/kg	8.7	30	15-OCT-18
Tin (Sn)		<1.0	<1.0	RPD-NA	mg/kg	N/A	40	15-OCT-18
Titanium (Ti)		498	501		mg/kg	0.6	40	15-OCT-18
Tungsten (W)		<0.50	<0.50	RPD-NA	mg/kg	N/A	30	15-OCT-18
Uranium (U)		0.856	0.810		mg/kg	5.6	30	15-OCT-18
Vanadium (V)		27.5	26.7		mg/kg	2.8	30	15-OCT-18
Zinc (Zn)		22.7	21.9		mg/kg	4.0	30	15-OCT-18
Zirconium (Zr)		4.5	4.5		mg/kg	0.8	30	15-OCT-18
WG2894273-4 LCS								
Aluminum (Al)			99.2		%		80-120	15-OCT-18
Antimony (Sb)			107.2		%		80-120	15-OCT-18
Arsenic (As)			98.4		%		80-120	15-OCT-18
Barium (Ba)			98.8		%		80-120	15-OCT-18
Beryllium (Be)			102.5		%		80-120	15-OCT-18
Boron (B)			91.9		%		80-120	15-OCT-18
Bismuth (Bi)			100.5		%		80-120	15-OCT-18
Cadmium (Cd)			99.0		%		80-120	15-OCT-18
Calcium (Ca)			101.2		%		80-120	15-OCT-18
Chromium (Cr)			96.8		%		80-120	15-OCT-18
Cobalt (Co)			93.4		%		80-120	15-OCT-18
Copper (Cu)			97.4		%		80-120	15-OCT-18
Iron (Fe)			103.6		%		80-120	15-OCT-18
Lead (Pb)			100.1		%		80-120	15-OCT-18
Lithium (Li)			102.8		%		80-120	15-OCT-18
Magnesium (Mg)			97.6		%		80-120	15-OCT-18
Manganese (Mn)			103.1		%		80-120	15-OCT-18
Molybdenum (Mo)			102.9		%		80-120	15-OCT-18
Nickel (Ni)			96.7		%		80-120	15-OCT-18
Phosphorus (P)			100.9		%		80-120	15-OCT-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-SK	**Soil**							
Batch R4278629								
WG2894273-4 LCS								
Potassium (K)			101.7		%		80-120	15-OCT-18
Selenium (Se)			96.4		%		80-120	15-OCT-18
Silver (Ag)			100.1		%		80-120	15-OCT-18
Sodium (Na)			98.1		%		80-120	15-OCT-18
Strontium (Sr)			99.8		%		80-120	15-OCT-18
Sulfur (S)			100.3		%		80-120	15-OCT-18
Thallium (Tl)			92.1		%		80-120	15-OCT-18
Tin (Sn)			96.8		%		80-120	15-OCT-18
Titanium (Ti)			88.3		%		80-120	15-OCT-18
Tungsten (W)			97.5		%		80-120	15-OCT-18
Uranium (U)			99.4		%		80-120	15-OCT-18
Vanadium (V)			98.6		%		80-120	15-OCT-18
Zinc (Zn)			98.3		%		80-120	15-OCT-18
Zirconium (Zr)			101.7		%		80-120	15-OCT-18
WG2894273-1 MB								
Aluminum (Al)			<50		mg/kg		50	15-OCT-18
Antimony (Sb)			<0.10		mg/kg		0.1	15-OCT-18
Arsenic (As)			<0.10		mg/kg		0.1	15-OCT-18
Barium (Ba)			<0.50		mg/kg		0.5	15-OCT-18
Beryllium (Be)			<0.10		mg/kg		0.1	15-OCT-18
Boron (B)			<5.0		mg/kg		5	15-OCT-18
Bismuth (Bi)			<0.20		mg/kg		0.2	15-OCT-18
Cadmium (Cd)			<0.020		mg/kg		0.02	15-OCT-18
Calcium (Ca)			<50		mg/kg		50	15-OCT-18
Chromium (Cr)			<0.50		mg/kg		0.5	15-OCT-18
Cobalt (Co)			<0.10		mg/kg		0.1	15-OCT-18
Copper (Cu)			<0.50		mg/kg		0.5	15-OCT-18
Iron (Fe)			<50		mg/kg		50	15-OCT-18
Lead (Pb)			<0.50		mg/kg		0.5	15-OCT-18
Lithium (Li)			<2.0		mg/kg		2	15-OCT-18
Magnesium (Mg)			<20		mg/kg		20	15-OCT-18
Manganese (Mn)			<1.0		mg/kg		1	15-OCT-18
Molybdenum (Mo)			<0.10		mg/kg		0.1	15-OCT-18
Nickel (Ni)			<0.50		mg/kg		0.5	15-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-SK	**Soil**							
Batch R4278629								
WG2894273-1 MB								
Phosphorus (P)			<50		mg/kg		50	15-OCT-18
Potassium (K)			<100		mg/kg		100	15-OCT-18
Selenium (Se)			<0.20		mg/kg		0.2	15-OCT-18
Silver (Ag)			<0.10		mg/kg		0.1	15-OCT-18
Sodium (Na)			<50		mg/kg		50	15-OCT-18
Strontium (Sr)			<0.50		mg/kg		0.5	15-OCT-18
Sulfur (S)			<1000		mg/kg		1000	15-OCT-18
Thallium (Tl)			<0.050		mg/kg		0.05	15-OCT-18
Tin (Sn)			<1.0		mg/kg		1	15-OCT-18
Titanium (Ti)			<1.0		mg/kg		1	15-OCT-18
Tungsten (W)			<0.50		mg/kg		0.5	15-OCT-18
Uranium (U)			<0.050		mg/kg		0.05	15-OCT-18
Vanadium (V)			<0.20		mg/kg		0.2	15-OCT-18
Zinc (Zn)			<2.0		mg/kg		2	15-OCT-18
Zirconium (Zr)			<1.0		mg/kg		1	15-OCT-18
N-TOTKJ-COL-SK	**Soil**							
Batch R4280989								
WG2893968-1 DUP		**L2170896-22**						
Total Kjeldahl Nitrogen		0.085	0.087		%	3.2	20	15-OCT-18
WG2893968-2 IRM		**08-109_SOIL**						
Total Kjeldahl Nitrogen			93.5		%		80-120	15-OCT-18
WG2893968-3 MB								
Total Kjeldahl Nitrogen			<0.020		%		0.02	15-OCT-18
Batch R4283767								
WG2893965-1 DUP		**L2170896-12**						
Total Kjeldahl Nitrogen		0.053	0.051		%	3.8	20	17-OCT-18
WG2893965-2 IRM		**08-109_SOIL**						
Total Kjeldahl Nitrogen			94.5		%		80-120	17-OCT-18
WG2893965-3 MB								
Total Kjeldahl Nitrogen			<0.020		%		0.02	17-OCT-18
ALK-TITR-VA	**Seawater**							
Batch R4257666								
WG2890442-3 CRM		**VA-ALK-TITR-CONTROL**						
Alkalinity, Total (as CaCO3)			102.0		%		85-115	02-OCT-18
WG2890442-1 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-VA	**Seawater**							
Batch R4257666								
WG2890442-1 MB								
Alkalinity, Total (as CaCO3)			<1.0		mg/L		1	02-OCT-18
ANIONS-C-BR-IC-VA	**Seawater**							
Batch R4258739								
WG2891645-3 DUP		**L2170896-27**						
Bromide (Br)		60.4	60.5		mg/L	0.2	20	02-OCT-18
WG2891645-2 LCS								
Bromide (Br)			100.4		%		85-115	02-OCT-18
WG2891645-1 MB								
Bromide (Br)			<5.0		mg/L		5	02-OCT-18
WG2891645-4 MS		**L2170896-28**						
Bromide (Br)			N/A	MS-B	%		-	02-OCT-18
ANIONS-C-CL-IC-VA	**Seawater**							
Batch R4258739								
WG2891645-3 DUP		**L2170896-27**						
Chloride (Cl)		17400	17300		mg/L	0.2	20	02-OCT-18
WG2891645-2 LCS								
Chloride (Cl)			100.0		%		90-110	02-OCT-18
WG2891645-1 MB								
Chloride (Cl)			<50		mg/L		50	02-OCT-18
WG2891645-4 MS		**L2170896-28**						
Chloride (Cl)			N/A	MS-B	%		-	02-OCT-18
ANIONS-C-F-IC-VA	**Seawater**							
Batch R4258739								
WG2891645-3 DUP		**L2170896-27**						
Fluoride (F)		1.0	<1.0	RPD-NA	mg/L	N/A	20	02-OCT-18
WG2891645-2 LCS								
Fluoride (F)			99.9		%		90-110	02-OCT-18
WG2891645-1 MB								
Fluoride (F)			<1.0		mg/L		1	02-OCT-18
WG2891645-4 MS		**L2170896-28**						
Fluoride (F)			N/A	MS-B	%		-	02-OCT-18
ANIONS-C-NO2-IC-VA	**Seawater**							
Batch R4258739								
WG2891645-3 DUP		**L2170896-27**						
Nitrite (as N)		<0.10	<0.10	RPD-NA	mg/L	N/A	20	02-OCT-18
WG2891645-2 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ANIONS-C-NO2-IC-VA	**Seawater**							
Batch R4258739								
WG2891645-2 LCS								
Nitrite (as N)			100.4		%		90-110	02-OCT-18
WG2891645-1 MB								
Nitrite (as N)			<0.10		mg/L		0.1	02-OCT-18
ANIONS-C-NO3-IC-VA	**Seawater**							
Batch R4258739								
WG2891645-3 DUP		**L2170896-27**						
Nitrate (as N)		<0.50	<0.50	RPD-NA	mg/L	N/A	20	02-OCT-18
WG2891645-2 LCS								
Nitrate (as N)			99.96		%		90-110	02-OCT-18
WG2891645-1 MB								
Nitrate (as N)			<0.50		mg/L		0.5	02-OCT-18
ANIONS-C-SO4-IC-VA	**Seawater**							
Batch R4258739								
WG2891645-3 DUP		**L2170896-27**						
Sulfate (SO4)		2450	2440		mg/L	0.3	20	02-OCT-18
WG2891645-2 LCS								
Sulfate (SO4)			100.8		%		90-110	02-OCT-18
WG2891645-1 MB								
Sulfate (SO4)			<30		mg/L		30	02-OCT-18
WG2891645-4 MS		**L2170896-28**						
Sulfate (SO4)			N/A	MS-B	%		-	02-OCT-18
CARBONS-C-DOC-VA	**Seawater**							
Batch R4257979								
WG2892697-4 LCS								
Dissolved Organic Carbon			96.8		%		80-120	02-OCT-18
WG2892697-3 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	02-OCT-18
CARBONS-C-TOC-VA	**Seawater**							
Batch R4257978								
WG2892696-1 LCS								
Total Organic Carbon			98.2		%		80-120	02-OCT-18
WG2892696-5 LCS								
Total Organic Carbon			95.6		%		80-120	02-OCT-18
WG2892696-4 MB								
Total Organic Carbon			<0.50		mg/L		0.5	02-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CARBONS-C-TOC-VA	**Seawater**							
Batch R4263002								
WG2895786-4 LCS								
Total Organic Carbon			99.5		%		80-120	04-OCT-18
WG2895786-3 MB								
Total Organic Carbon			<0.50		mg/L		0.5	04-OCT-18
EC-C-PCT-VA	**Seawater**							
Batch R4257666								
WG2890442-4 CRM		**VA-EC-PCT-CONTROL**						
Conductivity			101.8		%		90-110	02-OCT-18
WG2890442-1 MB								
Conductivity			<2.0		uS/cm		2	02-OCT-18
HG-DIS-C-CVAFS-VA	**Seawater**							
Batch R4280190								
WG2904000-2 LCS								
Mercury (Hg)-Dissolved			99.0		%		80-120	16-OCT-18
WG2904000-1 MB		**LF**						
Mercury (Hg)-Dissolved			<0.000010		mg/L		0.00001	16-OCT-18
HG-TOT-C-CVAFS-VA	**Seawater**							
Batch R4263241								
WG2897182-2 LCS								
Mercury (Hg)-Total			94.7		%		80-120	06-OCT-18
WG2897182-1 MB								
Mercury (Hg)-Total			<0.000010		mg/L		0.00001	06-OCT-18
MET-D-L-HRMS-VA	**Seawater**							
Batch R4286967								
WG2897898-2 LCS								
Aluminum (Al)-Dissolved			89.6		%		80-120	15-OCT-18
Aluminum (Al)-Dissolved			89.6		%		80-120	15-OCT-18
Antimony (Sb)-Dissolved			93.7		%		80-120	15-OCT-18
Antimony (Sb)-Dissolved			93.7		%		80-120	15-OCT-18
Arsenic (As)-Dissolved			93.4		%		80-120	15-OCT-18
Arsenic (As)-Dissolved			93.4		%		80-120	15-OCT-18
Barium (Ba)-Dissolved			102.0		%		80-120	15-OCT-18
Barium (Ba)-Dissolved			102.0		%		80-120	15-OCT-18
Beryllium (Be)-Dissolved			98.4		%		80-120	15-OCT-18
Beryllium (Be)-Dissolved			98.4		%		80-120	15-OCT-18
Bismuth (Bi)-Dissolved			88.6		%		80-120	15-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-L-HRMS-VA	**Seawater**							
Batch	**R4286967**							
WG2897898-2	**LCS**							
Bismuth (Bi)-Dissolved			88.6		%		80-120	15-OCT-18
Boron (B)-Dissolved			114.2		%		80-120	15-OCT-18
Boron (B)-Dissolved			114.2		%		80-120	15-OCT-18
Cadmium (Cd)-Dissolved			100.0		%		80-120	15-OCT-18
Cadmium (Cd)-Dissolved			100.0		%		80-120	15-OCT-18
Calcium (Ca)-Dissolved			96.9		%		80-120	15-OCT-18
Calcium (Ca)-Dissolved			96.9		%		80-120	15-OCT-18
Cesium (Cs)-Dissolved			106.0		%		80-120	15-OCT-18
Cesium (Cs)-Dissolved			106.0		%		80-120	15-OCT-18
Chromium (Cr)-Dissolved			104.0		%		80-120	15-OCT-18
Chromium (Cr)-Dissolved			104.0		%		80-120	15-OCT-18
Cobalt (Co)-Dissolved			95.2		%		80-120	15-OCT-18
Cobalt (Co)-Dissolved			95.2		%		80-120	15-OCT-18
Copper (Cu)-Dissolved			95.2		%		80-120	15-OCT-18
Copper (Cu)-Dissolved			95.2		%		80-120	15-OCT-18
Gallium (Ga)-Dissolved			96.4		%		80-120	15-OCT-18
Gallium (Ga)-Dissolved			96.4		%		80-120	15-OCT-18
Iron (Fe)-Dissolved			98.3		%		80-120	15-OCT-18
Iron (Fe)-Dissolved			98.3		%		80-120	15-OCT-18
Lead (Pb)-Dissolved			107.4		%		80-120	15-OCT-18
Lead (Pb)-Dissolved			107.4		%		80-120	15-OCT-18
Lithium (Li)-Dissolved			100.7		%		80-120	15-OCT-18
Lithium (Li)-Dissolved			100.7		%		80-120	15-OCT-18
Magnesium (Mg)-Dissolved			102.9		%		80-120	15-OCT-18
Magnesium (Mg)-Dissolved			102.9		%		80-120	15-OCT-18
Manganese (Mn)-Dissolved			106.0		%		80-120	15-OCT-18
Manganese (Mn)-Dissolved			106.0		%		80-120	15-OCT-18
Molybdenum (Mo)-Dissolved			104.4		%		80-120	15-OCT-18
Molybdenum (Mo)-Dissolved			104.4		%		80-120	15-OCT-18
Nickel (Ni)-Dissolved			97.4		%		80-120	15-OCT-18
Nickel (Ni)-Dissolved			97.4		%		80-120	15-OCT-18
Phosphorus (P)-Dissolved			101.1		%		80-120	15-OCT-18
Phosphorus (P)-Dissolved			101.1		%		80-120	15-OCT-18
Potassium (K)-Dissolved			98.1		%		80-120	15-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-L-HRMS-VA	**Seawater**							
Batch R4286967								
WG2897898-2 LCS								
Potassium (K)-Dissolved			98.1		%		80-120	15-OCT-18
Rhenium (Re)-Dissolved			99.3		%		80-120	15-OCT-18
Rhenium (Re)-Dissolved			99.3		%		80-120	15-OCT-18
Rubidium (Rb)-Dissolved			107.4		%		80-120	15-OCT-18
Rubidium (Rb)-Dissolved			107.4		%		80-120	15-OCT-18
Selenium (Se)-Dissolved			100.0		%		80-120	15-OCT-18
Selenium (Se)-Dissolved			100.0		%		80-120	15-OCT-18
Silicon (Si)-Dissolved			99.9		%		80-120	15-OCT-18
Silicon (Si)-Dissolved			99.9		%		80-120	15-OCT-18
Silver (Ag)-Dissolved			101.0		%		80-120	15-OCT-18
Silver (Ag)-Dissolved			101.0		%		80-120	15-OCT-18
Sodium (Na)-Dissolved			115.1		%		80-120	15-OCT-18
Sodium (Na)-Dissolved			115.1		%		80-120	15-OCT-18
Strontium (Sr)-Dissolved			93.2		%		80-120	15-OCT-18
Strontium (Sr)-Dissolved			93.2		%		80-120	15-OCT-18
Sulfur (S)-Dissolved			103.0		%		80-120	15-OCT-18
Sulfur (S)-Dissolved			103.0		%		80-120	15-OCT-18
Tellurium (Te)-Dissolved			106.0		%		80-120	15-OCT-18
Tellurium (Te)-Dissolved			106.0		%		80-120	15-OCT-18
Thallium (Tl)-Dissolved			94.5		%		80-120	15-OCT-18
Thallium (Tl)-Dissolved			94.5		%		80-120	15-OCT-18
Thorium (Th)-Dissolved			107.5		%		80-120	15-OCT-18
Thorium (Th)-Dissolved			107.5		%		80-120	15-OCT-18
Tin (Sn)-Dissolved			109.8		%		80-120	15-OCT-18
Tin (Sn)-Dissolved			109.8		%		80-120	15-OCT-18
Titanium (Ti)-Dissolved			97.2		%		80-120	15-OCT-18
Titanium (Ti)-Dissolved			97.2		%		80-120	15-OCT-18
Tungsten (W)-Dissolved			98.8		%		80-120	15-OCT-18
Tungsten (W)-Dissolved			98.8		%		80-120	15-OCT-18
Uranium (U)-Dissolved			108.6		%		80-120	15-OCT-18
Uranium (U)-Dissolved			108.6		%		80-120	15-OCT-18
Vanadium (V)-Dissolved			98.2		%		80-120	15-OCT-18
Vanadium (V)-Dissolved			98.2		%		80-120	15-OCT-18
Yttrium (Y)-Dissolved			113.0		%		80-120	15-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-L-HRMS-VA	**Seawater**							
Batch R4286967								
WG2897898-2 LCS								
Yttrium (Y)-Dissolved			113.0		%		80-120	15-OCT-18
Zinc (Zn)-Dissolved			93.2		%		80-120	15-OCT-18
Zinc (Zn)-Dissolved			93.2		%		80-120	15-OCT-18
Zirconium (Zr)-Dissolved			109.0		%		80-120	15-OCT-18
Zirconium (Zr)-Dissolved			109.0		%		80-120	15-OCT-18
WG2897898-1 MB		**LF**						
Aluminum (Al)-Dissolved			<0.0050		mg/L		0.005	16-OCT-18
Antimony (Sb)-Dissolved			<0.000010		mg/L		0.00001	15-OCT-18
Antimony (Sb)-Dissolved			<0.000010		mg/L		0.00001	15-OCT-18
Antimony (Sb)-Dissolved			<0.00050		mg/L		0.0005	16-OCT-18
Arsenic (As)-Dissolved			<0.0020		mg/L		0.002	16-OCT-18
Barium (Ba)-Dissolved			<0.0010		mg/L		0.001	15-OCT-18
Barium (Ba)-Dissolved			<0.0010		mg/L		0.001	15-OCT-18
Barium (Ba)-Dissolved			<0.0010		mg/L		0.001	16-OCT-18
Beryllium (Be)-Dissolved			<0.000005		mg/L		0.000005	15-OCT-18
Beryllium (Be)-Dissolved			<0.000005		mg/L		0.000005	15-OCT-18
Beryllium (Be)-Dissolved			<0.00050		mg/L		0.0005	16-OCT-18
Bismuth (Bi)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Bismuth (Bi)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Bismuth (Bi)-Dissolved			<0.00050		mg/L		0.0005	16-OCT-18
Boron (B)-Dissolved			<0.10		mg/L		0.1	16-OCT-18
Cadmium (Cd)-Dissolved			<0.000050		mg/L		0.00005	16-OCT-18
Calcium (Ca)-Dissolved			<1.0		mg/L		1	16-OCT-18
Cesium (Cs)-Dissolved			<0.000005		mg/L		0.000005	15-OCT-18
Cesium (Cs)-Dissolved			<0.000005		mg/L		0.000005	15-OCT-18
Cesium (Cs)-Dissolved			<0.00050		mg/L		0.0005	16-OCT-18
Chromium (Cr)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Chromium (Cr)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Chromium (Cr)-Dissolved			<0.00050		mg/L		0.0005	16-OCT-18
Cobalt (Co)-Dissolved			<0.000050		mg/L		0.00005	15-OCT-18
Cobalt (Co)-Dissolved			<0.000050		mg/L		0.00005	15-OCT-18
Cobalt (Co)-Dissolved			<0.000050		mg/L		0.00005	16-OCT-18
Copper (Cu)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Copper (Cu)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-L-HRMS-VA	**Seawater**							
Batch R4286967								
WG2897898-1 MB		**LF**						
Copper (Cu)-Dissolved			<0.00050		mg/L		0.0005	16-OCT-18
Gallium (Ga)-Dissolved			<0.000050		mg/L		0.00005	15-OCT-18
Gallium (Ga)-Dissolved			<0.000050		mg/L		0.00005	15-OCT-18
Gallium (Ga)-Dissolved			<0.00050		mg/L		0.0005	16-OCT-18
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	15-OCT-18
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	15-OCT-18
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	16-OCT-18
Lead (Pb)-Dissolved			<0.00030		mg/L		0.0003	15-OCT-18
Lead (Pb)-Dissolved			<0.00030		mg/L		0.0003	15-OCT-18
Lead (Pb)-Dissolved			<0.00030		mg/L		0.0003	16-OCT-18
Lithium (Li)-Dissolved			<0.020		mg/L		0.02	16-OCT-18
Magnesium (Mg)-Dissolved			<1.0		mg/L		1	15-OCT-18
Magnesium (Mg)-Dissolved			<1.0		mg/L		1	15-OCT-18
Magnesium (Mg)-Dissolved			<1.0		mg/L		1	16-OCT-18
Manganese (Mn)-Dissolved			<0.00020		mg/L		0.0002	15-OCT-18
Manganese (Mn)-Dissolved			<0.00020		mg/L		0.0002	15-OCT-18
Manganese (Mn)-Dissolved			<0.00020		mg/L		0.0002	16-OCT-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	15-OCT-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	15-OCT-18
Molybdenum (Mo)-Dissolved			<0.0020		mg/L		0.002	16-OCT-18
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Nickel (Ni)-Dissolved			<0.00050		mg/L		0.0005	16-OCT-18
Phosphorus (P)-Dissolved			<0.050		mg/L		0.05	15-OCT-18
Phosphorus (P)-Dissolved			<0.050		mg/L		0.05	15-OCT-18
Phosphorus (P)-Dissolved			<0.050		mg/L		0.05	16-OCT-18
Potassium (K)-Dissolved			<1.0		mg/L		1	16-OCT-18
Rhenium (Re)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Rhenium (Re)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Rhenium (Re)-Dissolved			<0.00050		mg/L		0.0005	16-OCT-18
Rubidium (Rb)-Dissolved			<0.0050		mg/L		0.005	16-OCT-18
Selenium (Se)-Dissolved			<0.0020		mg/L		0.002	15-OCT-18
Selenium (Se)-Dissolved			<0.0020		mg/L		0.002	15-OCT-18
Selenium (Se)-Dissolved			<0.0020		mg/L		0.002	16-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-L-HRMS-VA	**Seawater**							
Batch R4286967								
WG2897898-1 MB		**LF**						
Silicon (Si)-Dissolved			<1.0		mg/L		1	16-OCT-18
Silver (Ag)-Dissolved			<0.00010		mg/L		0.0001	16-OCT-18
Sodium (Na)-Dissolved			<1.0		mg/L		1	16-OCT-18
Strontium (Sr)-Dissolved			<0.010		mg/L		0.01	15-OCT-18
Strontium (Sr)-Dissolved			<0.010		mg/L		0.01	15-OCT-18
Strontium (Sr)-Dissolved			<0.010		mg/L		0.01	16-OCT-18
Sulfur (S)-Dissolved			<5.0		mg/L		5	15-OCT-18
Sulfur (S)-Dissolved			<5.0		mg/L		5	15-OCT-18
Sulfur (S)-Dissolved			<5.0		mg/L		5	16-OCT-18
Tellurium (Te)-Dissolved			<0.000010		mg/L		0.00001	15-OCT-18
Tellurium (Te)-Dissolved			<0.000010		mg/L		0.00001	15-OCT-18
Tellurium (Te)-Dissolved			<0.00050		mg/L		0.0005	16-OCT-18
Thallium (Tl)-Dissolved			<0.000050		mg/L		0.00005	15-OCT-18
Thallium (Tl)-Dissolved			<0.000050		mg/L		0.00005	15-OCT-18
Thallium (Tl)-Dissolved			<0.000050		mg/L		0.00005	16-OCT-18
Thorium (Th)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Thorium (Th)-Dissolved			<0.00050		mg/L		0.0005	15-OCT-18
Thorium (Th)-Dissolved			<0.00050		mg/L		0.0005	16-OCT-18
Tin (Sn)-Dissolved			<0.0010		mg/L		0.001	15-OCT-18
Tin (Sn)-Dissolved			<0.0010		mg/L		0.001	15-OCT-18
Tin (Sn)-Dissolved			<0.0010		mg/L		0.001	16-OCT-18
Titanium (Ti)-Dissolved			<0.00020		mg/L		0.0002	15-OCT-18
Titanium (Ti)-Dissolved			<0.00020		mg/L		0.0002	15-OCT-18
Titanium (Ti)-Dissolved			<0.0050		mg/L		0.005	16-OCT-18
Tungsten (W)-Dissolved			<0.000010		mg/L		0.00001	15-OCT-18
Tungsten (W)-Dissolved			<0.000010		mg/L		0.00001	15-OCT-18
Tungsten (W)-Dissolved			<0.0010		mg/L		0.001	16-OCT-18
Uranium (U)-Dissolved			<0.000050		mg/L		0.00005	15-OCT-18
Uranium (U)-Dissolved			<0.000050		mg/L		0.00005	15-OCT-18
Uranium (U)-Dissolved			<0.000050		mg/L		0.00005	16-OCT-18
Vanadium (V)-Dissolved			<0.00050		mg/L		0.0005	16-OCT-18
Yttrium (Y)-Dissolved			<0.000005C		mg/L		0.000005	15-OCT-18
Yttrium (Y)-Dissolved			<0.000005C		mg/L		0.000005	15-OCT-18
Yttrium (Y)-Dissolved			<0.00050		mg/L		0.0005	16-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-L-HRMS-VA	**Seawater**							
Batch R4286967								
WG2897898-1 MB		**LF**						
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	15-OCT-18
Zinc (Zn)-Dissolved			<0.0010		mg/L		0.001	15-OCT-18
Zinc (Zn)-Dissolved			<0.0030		mg/L		0.003	16-OCT-18
Zirconium (Zr)-Dissolved			<0.000050		mg/L		0.00005	15-OCT-18
Zirconium (Zr)-Dissolved			<0.000050		mg/L		0.00005	15-OCT-18
Zirconium (Zr)-Dissolved			<0.00050		mg/L		0.0005	16-OCT-18
Batch R4288587								
WG2897898-3 DUP		**L2170896-29**						
Aluminum (Al)-Dissolved		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	19-OCT-18
Antimony (Sb)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	19-OCT-18
Arsenic (As)-Dissolved		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	19-OCT-18
Barium (Ba)-Dissolved		0.0098	0.0100		mg/L	1.7	20	19-OCT-18
Beryllium (Be)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	19-OCT-18
Bismuth (Bi)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	19-OCT-18
Boron (B)-Dissolved		4.21	4.01		mg/L	4.8	20	19-OCT-18
Cadmium (Cd)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	19-OCT-18
Calcium (Ca)-Dissolved		312	335		mg/L	7.0	20	19-OCT-18
Cesium (Cs)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	19-OCT-18
Chromium (Cr)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	19-OCT-18
Cobalt (Co)-Dissolved		<0.000050	0.000058	RPD-NA	mg/L	N/A	20	19-OCT-18
Copper (Cu)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	19-OCT-18
Gallium (Ga)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	19-OCT-18
Iron (Fe)-Dissolved		<0.010	<0.010	RPD-NA	mg/L	N/A	20	19-OCT-18
Lead (Pb)-Dissolved		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	19-OCT-18
Lithium (Li)-Dissolved		0.205	0.192		mg/L	6.8	20	19-OCT-18
Magnesium (Mg)-Dissolved		970	964		mg/L	0.7	20	19-OCT-18
Manganese (Mn)-Dissolved		0.00026	0.00033	J	mg/L	0.00007	0.0004	19-OCT-18
Molybdenum (Mo)-Dissolved		0.0128	0.0123		mg/L	3.4	20	19-OCT-18
Nickel (Ni)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	19-OCT-18
Phosphorus (P)-Dissolved		<0.050	<0.050	RPD-NA	mg/L	N/A	20	19-OCT-18
Potassium (K)-Dissolved		321	335		mg/L	4.4	20	19-OCT-18
Rhenium (Re)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	19-OCT-18
Rubidium (Rb)-Dissolved		0.118	0.112		mg/L	4.7	20	19-OCT-18
Selenium (Se)-Dissolved		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	19-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-L-HRMS-VA	**Seawater**							
Batch R4288587								
WG2897898-3 DUP		**L2170896-29**						
Silicon (Si)-Dissolved		<1.0	<1.0	RPD-NA	mg/L	N/A	20	19-OCT-18
Silver (Ag)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	19-OCT-18
Sodium (Na)-Dissolved		8680	8980		mg/L	3.5	20	19-OCT-18
Strontium (Sr)-Dissolved		5.40	5.39		mg/L	0.1	20	19-OCT-18
Sulfur (S)-Dissolved		716	708		mg/L	1.2	20	19-OCT-18
Tellurium (Te)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	19-OCT-18
Thallium (Tl)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	19-OCT-18
Thorium (Th)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	19-OCT-18
Tin (Sn)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	19-OCT-18
Titanium (Ti)-Dissolved		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	19-OCT-18
Tungsten (W)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	19-OCT-18
Uranium (U)-Dissolved		0.00301	0.00301		mg/L	0.3	20	19-OCT-18
Vanadium (V)-Dissolved		0.00120	0.00117		mg/L	2.6	20	19-OCT-18
Yttrium (Y)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	19-OCT-18
Zinc (Zn)-Dissolved		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	19-OCT-18
Zirconium (Zr)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	19-OCT-18
MET-T-L-HRMS-VA	**Seawater**							
Batch R4286967								
WG2897866-2 LCS								
Aluminum (Al)-Total			93.6		%		80-120	15-OCT-18
Antimony (Sb)-Total			96.6		%		80-120	15-OCT-18
Arsenic (As)-Total			100.4		%		80-120	15-OCT-18
Barium (Ba)-Total			104.4		%		80-120	15-OCT-18
Beryllium (Be)-Total			101.0		%		80-120	15-OCT-18
Bismuth (Bi)-Total			90.9		%		80-120	15-OCT-18
Boron (B)-Total			119.0		%		80-120	15-OCT-18
Cadmium (Cd)-Total			105.0		%		80-120	15-OCT-18
Calcium (Ca)-Total			97.1		%		80-120	15-OCT-18
Cesium (Cs)-Total			107.2		%		80-120	15-OCT-18
Chromium (Cr)-Total			100.0		%		80-120	15-OCT-18
Cobalt (Co)-Total			98.4		%		80-120	15-OCT-18
Copper (Cu)-Total			96.8		%		80-120	15-OCT-18
Gallium (Ga)-Total			100.0		%		80-120	15-OCT-18
Iron (Fe)-Total			101.3		%		80-120	15-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-HRMS-VA	**Seawater**							
Batch R4286967								
WG2897866-2 LCS								
Lead (Pb)-Total			107.2		%		80-120	15-OCT-18
Lithium (Li)-Total			102.8		%		80-120	15-OCT-18
Magnesium (Mg)-Total			106.7		%		80-120	15-OCT-18
Manganese (Mn)-Total			110.0		%		80-120	15-OCT-18
Molybdenum (Mo)-Total			106.8		%		80-120	15-OCT-18
Nickel (Ni)-Total			100.4		%		80-120	15-OCT-18
Phosphorus (P)-Total			107.1		%		80-120	15-OCT-18
Potassium (K)-Total			101.2		%		80-120	15-OCT-18
Rhenium (Re)-Total			103.0		%		80-120	15-OCT-18
Rubidium (Rb)-Total			109.3		%		80-120	15-OCT-18
Selenium (Se)-Total			103.1		%		80-120	15-OCT-18
Silicon (Si)-Total			103.0		%		80-120	15-OCT-18
Silver (Ag)-Total			103.0		%		80-120	15-OCT-18
Sodium (Na)-Total			114.9		%		80-120	15-OCT-18
Strontium (Sr)-Total			95.6		%		80-120	15-OCT-18
Sulfur (S)-Total			108.1		%		70-130	15-OCT-18
Tellurium (Te)-Total			106.0		%		80-120	15-OCT-18
Thallium (Tl)-Total			96.5		%		80-120	15-OCT-18
Thorium (Th)-Total			107.5		%		80-120	15-OCT-18
Tin (Sn)-Total			113.0		%		80-120	15-OCT-18
Titanium (Ti)-Total			98.4		%		80-120	15-OCT-18
Tungsten (W)-Total			101.0		%		80-120	15-OCT-18
Uranium (U)-Total			109.6		%		80-120	15-OCT-18
Vanadium (V)-Total			101.4		%		80-120	15-OCT-18
Yttrium (Y)-Total			114.0		%		80-120	15-OCT-18
Zinc (Zn)-Total			100.6		%		80-120	15-OCT-18
Zirconium (Zr)-Total			109.0		%		80-120	15-OCT-18
WG2897866-1 MB								
Aluminum (Al)-Total			<0.0050		mg/L		0.005	15-OCT-18
Antimony (Sb)-Total			<0.00050		mg/L		0.0005	15-OCT-18
Arsenic (As)-Total			<0.0020		mg/L		0.002	15-OCT-18
Barium (Ba)-Total			<0.0010		mg/L		0.001	15-OCT-18
Beryllium (Be)-Total			<0.00050		mg/L		0.0005	15-OCT-18
Bismuth (Bi)-Total			<0.00050		mg/L		0.0005	15-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-HRMS-VA	**Seawater**							
Batch R4286967								
WG2897866-1 MB								
Boron (B)-Total			<0.10		mg/L		0.1	15-OCT-18
Cadmium (Cd)-Total			<0.000050		mg/L		0.00005	15-OCT-18
Calcium (Ca)-Total			<1.0		mg/L		1	15-OCT-18
Cesium (Cs)-Total			<0.00050		mg/L		0.0005	15-OCT-18
Chromium (Cr)-Total			<0.00050		mg/L		0.0005	15-OCT-18
Cobalt (Co)-Total			<0.000050		mg/L		0.00005	15-OCT-18
Copper (Cu)-Total			<0.00050		mg/L		0.0005	15-OCT-18
Gallium (Ga)-Total			<0.00050		mg/L		0.0005	15-OCT-18
Iron (Fe)-Total			<0.010		mg/L		0.01	15-OCT-18
Lead (Pb)-Total			<0.00030		mg/L		0.0003	15-OCT-18
Lithium (Li)-Total			<0.020		mg/L		0.02	15-OCT-18
Magnesium (Mg)-Total			<1.0		mg/L		1	15-OCT-18
Manganese (Mn)-Total			<0.00020		mg/L		0.0002	15-OCT-18
Molybdenum (Mo)-Total			<0.0020		mg/L		0.002	15-OCT-18
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	15-OCT-18
Phosphorus (P)-Total			<0.050		mg/L		0.05	15-OCT-18
Potassium (K)-Total			<1.0		mg/L		1	15-OCT-18
Rhenium (Re)-Total			<0.00050		mg/L		0.0005	15-OCT-18
Rubidium (Rb)-Total			<0.0050		mg/L		0.005	15-OCT-18
Selenium (Se)-Total			<0.0020		mg/L		0.002	15-OCT-18
Silicon (Si)-Total			<1.0		mg/L		1	15-OCT-18
Silver (Ag)-Total			<0.00010		mg/L		0.0001	15-OCT-18
Sodium (Na)-Total			<1.0		mg/L		1	15-OCT-18
Strontium (Sr)-Total			<0.010		mg/L		0.01	15-OCT-18
Sulfur (S)-Total			<5.0		mg/L		5	15-OCT-18
Tellurium (Te)-Total			<0.00050		mg/L		0.0005	15-OCT-18
Thallium (Tl)-Total			<0.000050		mg/L		0.00005	15-OCT-18
Thorium (Th)-Total			<0.00050		mg/L		0.0005	15-OCT-18
Tin (Sn)-Total			<0.0010		mg/L		0.001	15-OCT-18
Titanium (Ti)-Total			<0.0050		mg/L		0.005	15-OCT-18
Tungsten (W)-Total			<0.0010		mg/L		0.001	15-OCT-18
Uranium (U)-Total			<0.000050		mg/L		0.00005	15-OCT-18
Vanadium (V)-Total			<0.00050		mg/L		0.0005	15-OCT-18
Yttrium (Y)-Total			<0.00050		mg/L		0.0005	15-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-L-HRMS-VA	**Seawater**							
Batch R4286967								
WG2897866-1 MB								
Zinc (Zn)-Total			<0.0030		mg/L		0.003	15-OCT-18
Zirconium (Zr)-Total			<0.00050		mg/L		0.0005	15-OCT-18
NH3-F-VA	**Seawater**							
Batch R4282102								
WG2904276-3 DUP		**L2170896-29**						
Ammonia, Total (as N)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	16-OCT-18
WG2904276-2 LCS								
Ammonia, Total (as N)			99.7		%		85-115	16-OCT-18
WG2904276-1 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	16-OCT-18
WG2904276-4 MS		**L2170896-29**						
Ammonia, Total (as N)			102.6		%		75-125	16-OCT-18
P-T-COL-VA	**Seawater**							
Batch R4255689								
WG2891084-2 CRM		**VA-ERA-PO4**						
Phosphorus (P)-Total			102.9		%		80-120	01-OCT-18
WG2891084-3 DUP		**L2170896-27**						
Phosphorus (P)-Total		0.0273	0.0257		mg/L	5.8	20	01-OCT-18
WG2891084-1 MB								
Phosphorus (P)-Total			<0.0040		mg/L		0.004	01-OCT-18
PH-C-PCT-VA	**Seawater**							
Batch R4257666								
WG2890442-2 CRM		**VA-PH7-BUF**						
pH			7.04		pH		6.9-7.1	02-OCT-18
PO4-DO-COL-VA	**Seawater**							
Batch R4252115								
WG2890710-2 CRM		**VA-OPO4-CONTROL**						
Orthophosphate-Dissolved (as P)			101.0		%		80-120	29-SEP-18
WG2890710-3 DUP		**L2170896-27**						
Orthophosphate-Dissolved (as P)		0.0187	0.0182		mg/L	2.8	20	29-SEP-18
WG2890710-1 MB								
Orthophosphate-Dissolved (as P)			<0.0010		mg/L		0.001	29-SEP-18
WG2890710-4 MS		**L2170896-28**						
Orthophosphate-Dissolved (as P)			96.5		%		70-130	29-SEP-18
SIO2-L-COL-VA	**Seawater**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SIO2-L-COL-VA	**Seawater**							
Batch R4258600								
WG2893982-2 CRM		**VA-SIO2-L-0.025**						
Silicate (as SiO2)			105.3		%		85-115	03-OCT-18
WG2893982-1 MB								
Silicate (as SiO2)			<0.010		mg/L		0.01	03-OCT-18
TDS-VA	**Seawater**							
Batch R4253115								
WG2890897-3 DUP		**L2170896-27**						
Total Dissolved Solids		35400	36400		mg/L	2.8	20	29-SEP-18
WG2890897-2 LCS								
Total Dissolved Solids			103.5		%		85-115	29-SEP-18
WG2890897-1 MB								
Total Dissolved Solids			<10		mg/L		10	29-SEP-18
TKN-C-F-VA	**Seawater**							
Batch R4272089								
WG2899817-3 DUP		**L2170896-29**						
Total Kjeldahl Nitrogen		0.133	0.125		mg/L	6.3	20	11-OCT-18
WG2899817-2 LCS								
Total Kjeldahl Nitrogen			92.5		%		75-125	11-OCT-18
WG2899817-1 MB								
Total Kjeldahl Nitrogen			<0.050		mg/L		0.05	11-OCT-18
WG2899817-4 MS		**L2170896-30**						
Total Kjeldahl Nitrogen			114.3		%		70-130	11-OCT-18
TSS-C-VA	**Seawater**							
Batch R4253121								
WG2890894-2 LCS								
Total Suspended Solids			97.7		%		85-115	29-SEP-18
WG2890894-1 MB								
Total Suspended Solids			<2.0		mg/L		2	29-SEP-18

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Total Dissolved Solids by Gravimetric							
	27	20-SEP-18 11:00	29-SEP-18 15:57	7	9	days	EHT
	28	20-SEP-18 11:00	29-SEP-18 15:57	7	9	days	EHT
	29	20-SEP-18 12:00	29-SEP-18 15:57	7	9	days	EHT
	30	20-SEP-18 12:00	29-SEP-18 15:57	7	9	days	EHT
Total Suspended Solids by Gravimetric							
	27	20-SEP-18 11:00	29-SEP-18 15:56	7	9	days	EHT
	28	20-SEP-18 11:00	29-SEP-18 15:56	7	9	days	EHT
	29	20-SEP-18 12:00	29-SEP-18 15:56	7	9	days	EHT
	30	20-SEP-18 12:00	29-SEP-18 15:56	7	9	days	EHT
pH by Meter (Automated) (seawater)							
	27	20-SEP-18 11:00	02-OCT-18 13:45	0.25	291	hours	EHTR-FM
	28	20-SEP-18 11:00	02-OCT-18 13:45	0.25	291	hours	EHTR-FM
	29	20-SEP-18 12:00	02-OCT-18 13:45	0.25	290	hours	EHTR-FM
	30	20-SEP-18 12:00	02-OCT-18 13:45	0.25	290	hours	EHTR-FM
Anions and Nutrients							
D-Orthophosphate in Seawater by Colour							
	27	20-SEP-18 11:00	29-SEP-18 15:17	3	9	days	EHTR
	28	20-SEP-18 11:00	29-SEP-18 15:19	3	9	days	EHTR
	29	20-SEP-18 12:00	29-SEP-18 15:19	3	9	days	EHTR
	30	20-SEP-18 12:00	29-SEP-18 15:20	3	9	days	EHTR
Nitrate in Seawater by IC							
	27	20-SEP-18 11:00	02-OCT-18 07:08	3	12	days	EHTR
	28	20-SEP-18 11:00	02-OCT-18 07:08	3	12	days	EHTR
	29	20-SEP-18 12:00	02-OCT-18 07:08	3	12	days	EHTR
	30	20-SEP-18 12:00	02-OCT-18 07:08	3	12	days	EHTR
Nitrite in Seawater by IC							
	27	20-SEP-18 11:00	02-OCT-18 07:08	3	12	days	EHTR
	28	20-SEP-18 11:00	02-OCT-18 07:08	3	12	days	EHTR
	29	20-SEP-18 12:00	02-OCT-18 07:08	3	12	days	EHTR
	30	20-SEP-18 12:00	02-OCT-18 07:08	3	12	days	EHTR
Total P in Seawater by Colour							
	27	20-SEP-18 11:00	01-OCT-18 17:29	3	11	days	EHTR
	28	20-SEP-18 11:00	01-OCT-18 17:29	3	11	days	EHTR
	29	20-SEP-18 12:00	01-OCT-18 17:29	3	11	days	EHTR
	30	20-SEP-18 12:00	01-OCT-18 17:29	3	11	days	EHTR
Metals							
Mercury in Soil by CVAAS							
	8	13-SEP-18 15:00	18-OCT-18 13:00	28	35	days	EHT
	26	13-SEP-18 17:00	12-OCT-18 14:00	28	29	days	EHT

Legend & Qualifier Definitions:

EHTR-FM:	Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR:	Exceeded ALS recommended hold time prior to sample receipt.
EHTL:	Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT:	Exceeded ALS recommended hold time prior to analysis.
Rec. HT:	ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2170896 were received on 26-SEP-18 09:00.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the

US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

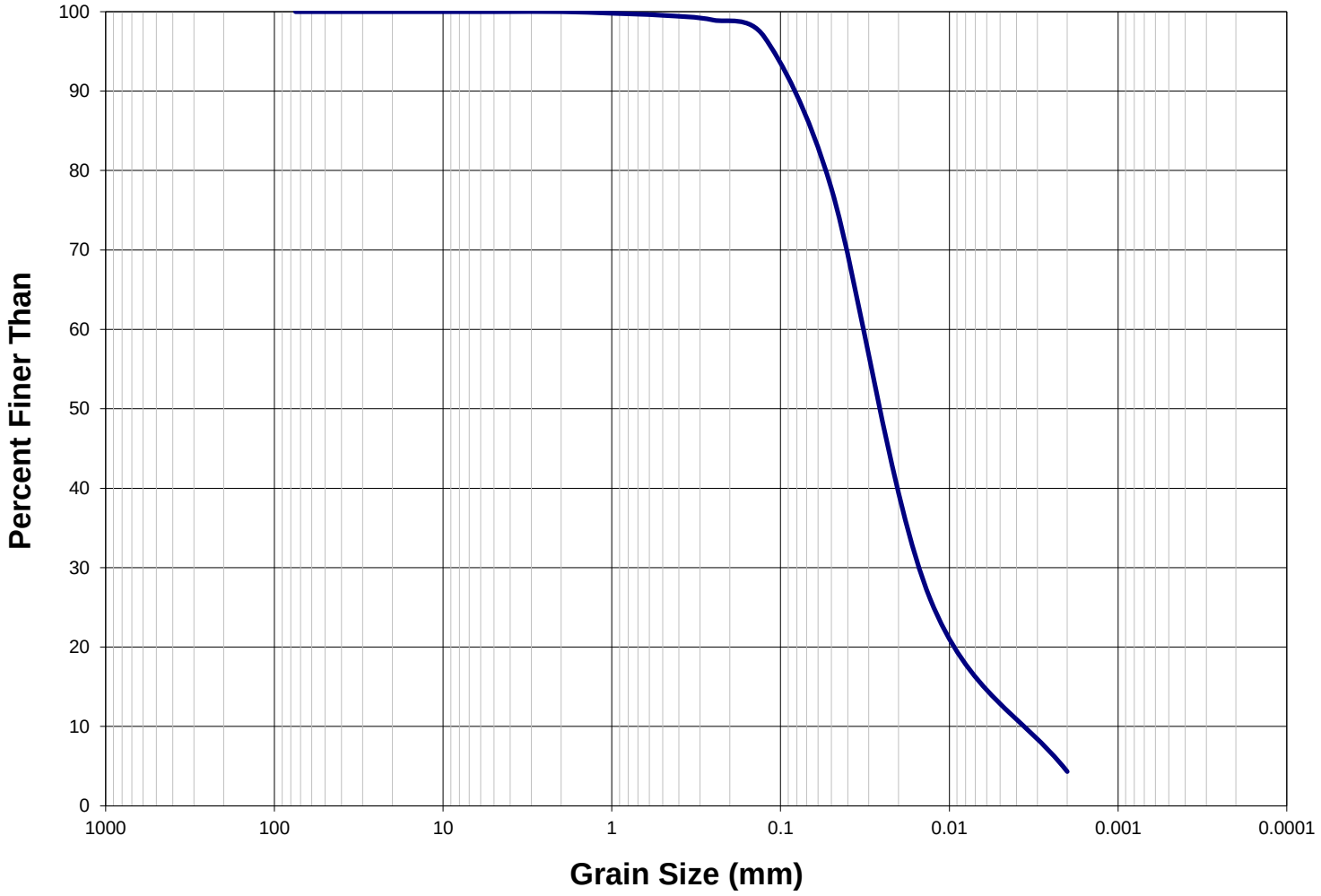
Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MBE-1 REP 1
Lab ID: L2170896-1

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	8.08	Clay
64 - 4	0.00	Pebble			
4 - 2	0.00	Granule			
2 - 1	0.20	Very coarse s			
1 - 0.5	0.26	Coarse sand			
0.5 - 0.25	0.60	Medium sand			
0.25 - 0.125	2.11	Fine sand			
0.125 - 0.0625	15.92	Very fine san			
0.0625 - 0.031	29.71	Coarse silt			
0.031 - 0.0156	21.50	Medium silt			
0.0156 - 0.0078	13.92	Fine silt			
0.0078 - 0.0039	7.72	Very fine silt			

Texture: Silt loam

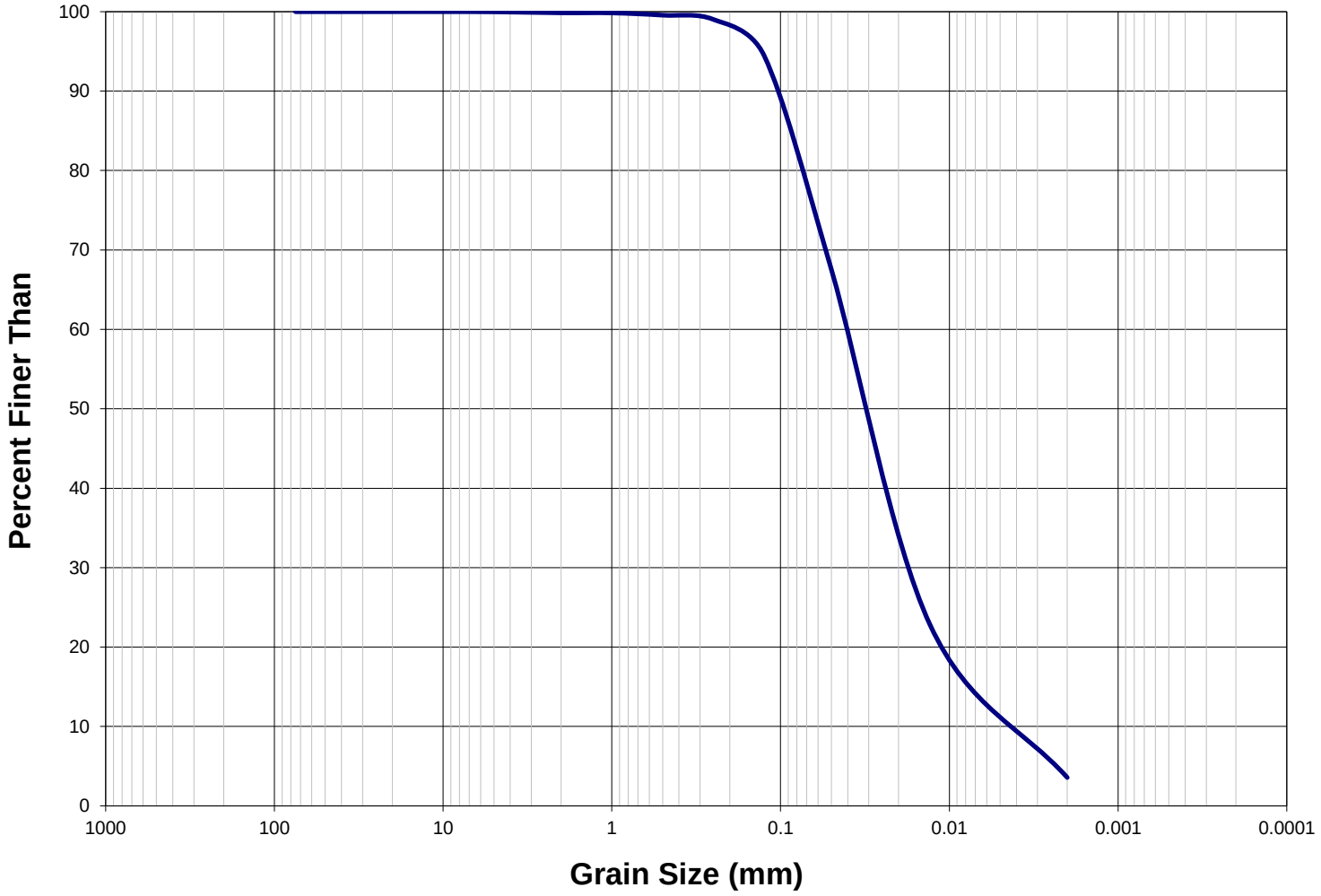
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MBE-4 REP 1
Lab ID: L2170896-10

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	6.89	Clay
64 - 4	0.06	Pebble			
4 - 2	0.09	Granule			
2 - 1	0.01	Very coarse s			
1 - 0.5	0.28	Coarse sand			
0.5 - 0.25	0.54	Medium sand			
0.25 - 0.125	4.58	Fine sand			
0.125 - 0.0625	22.42	Very fine san			
0.0625 - 0.031	27.46	Coarse silt			
0.031 - 0.0156	18.62	Medium silt			
0.0156 - 0.0078	12.23	Fine silt			
0.0078 - 0.0039	6.81	Very fine silt			

Texture: Silt loam

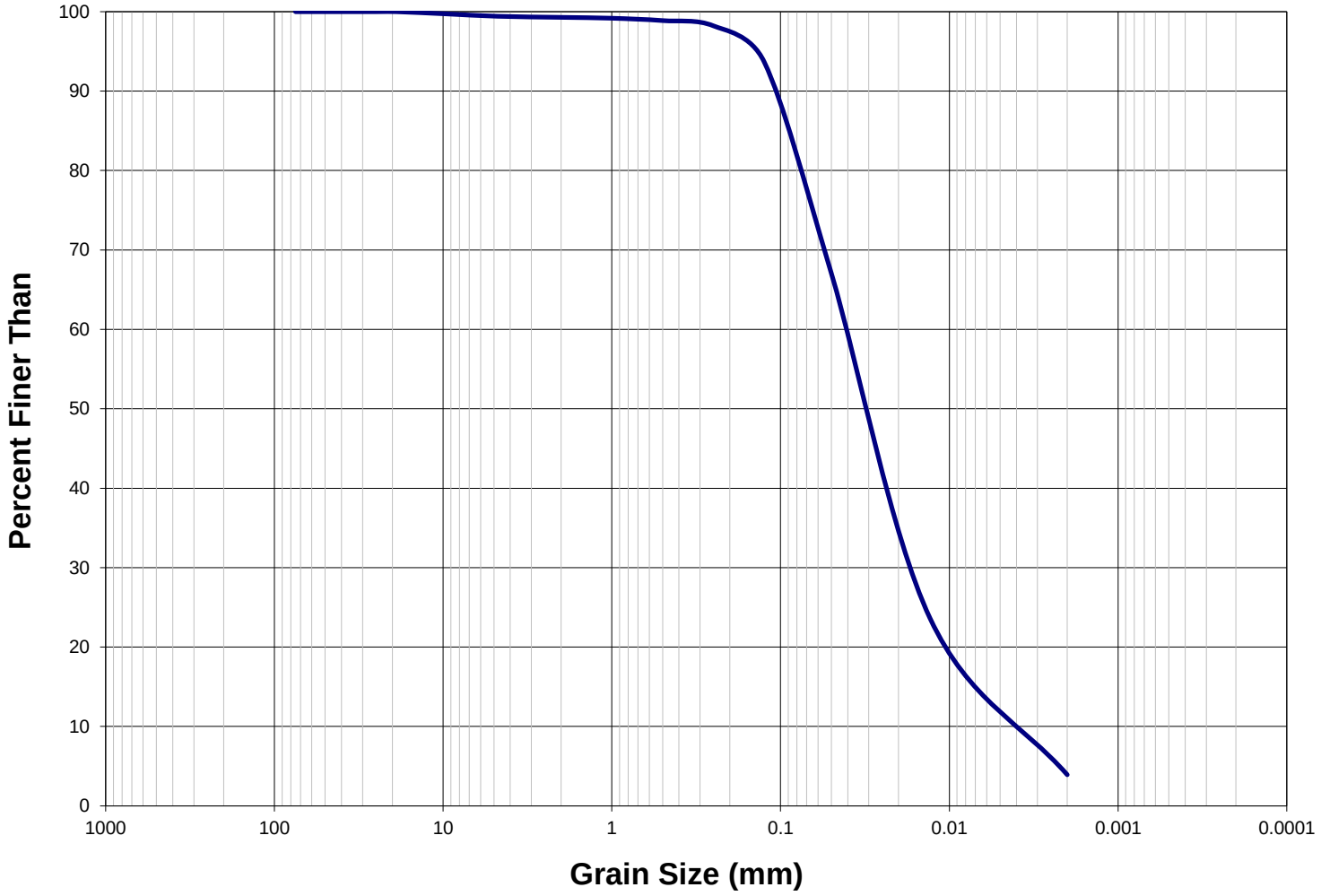
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MBE-4 REP 2
Lab ID: L2170896-11

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	7.33	Clay
64 - 4	0.62	Pebble			
4 - 2	0.10	Granule			
2 - 1	0.11	Very coarse s			
1 - 0.5	0.30	Coarse sand			
0.5 - 0.25	0.66	Medium sand			
0.25 - 0.125	4.55	Fine sand			
0.125 - 0.0625	22.19	Very fine san			
0.0625 - 0.031	26.74	Coarse silt			
0.031 - 0.0156	18.08	Medium silt			
0.0156 - 0.0078	12.36	Fine silt			
0.0078 - 0.0039	6.98	Very fine silt			

Texture: Silt loam

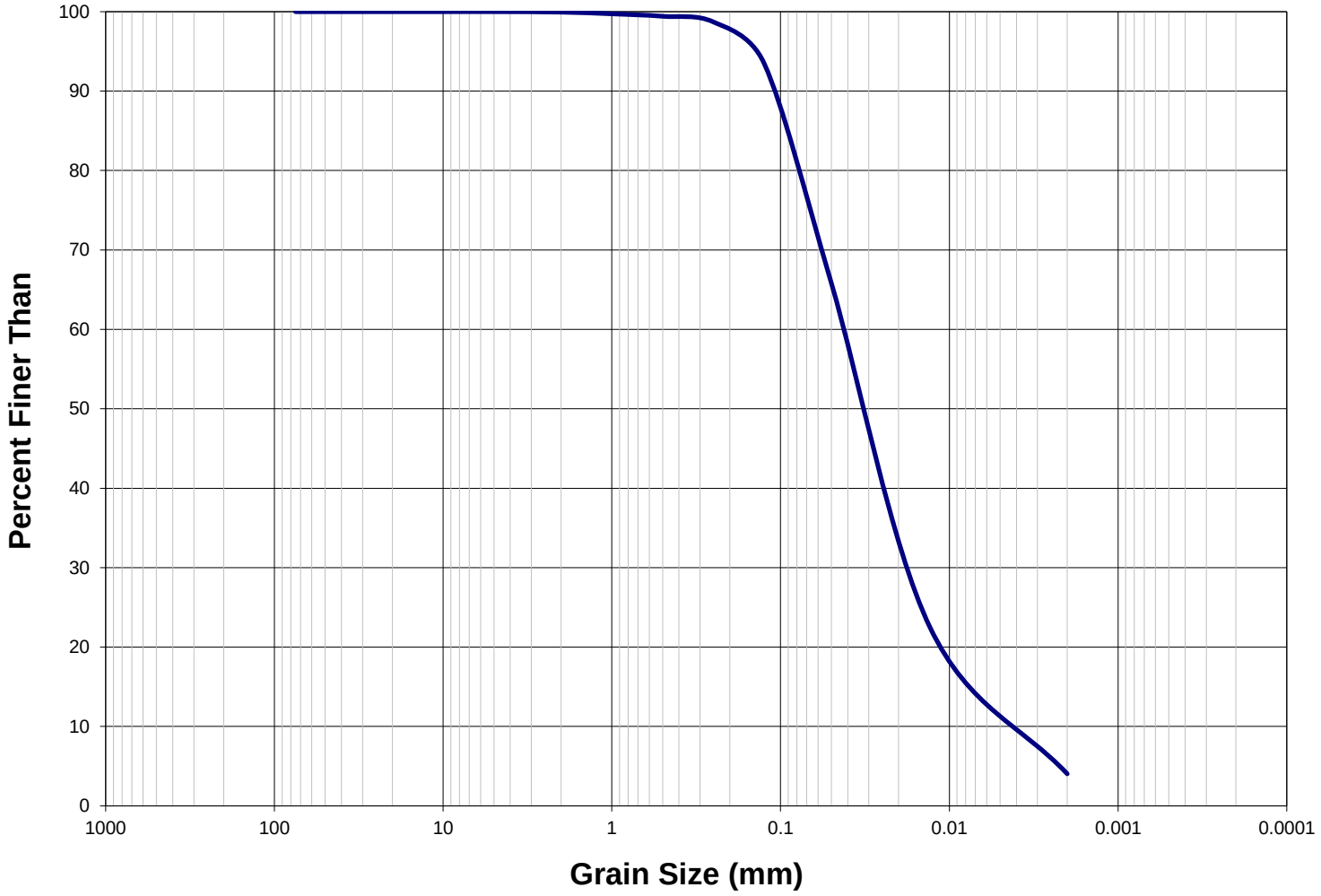
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MBE-4 REP 3
Lab ID: L2170896-12

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	7.22	Clay
64 - 4	0.02	Pebble			
4 - 2	0.04	Granule			
2 - 1	0.22	Very coarse s			
1 - 0.5	0.31	Coarse sand			
0.5 - 0.25	0.72	Medium sand			
0.25 - 0.125	5.24	Fine sand			
0.125 - 0.0625	23.04	Very fine san			
0.0625 - 0.031	26.87	Coarse silt			
0.031 - 0.0156	18.05	Medium silt			
0.0156 - 0.0078	11.76	Fine silt			
0.0078 - 0.0039	6.53	Very fine silt			

Texture: Silt loam

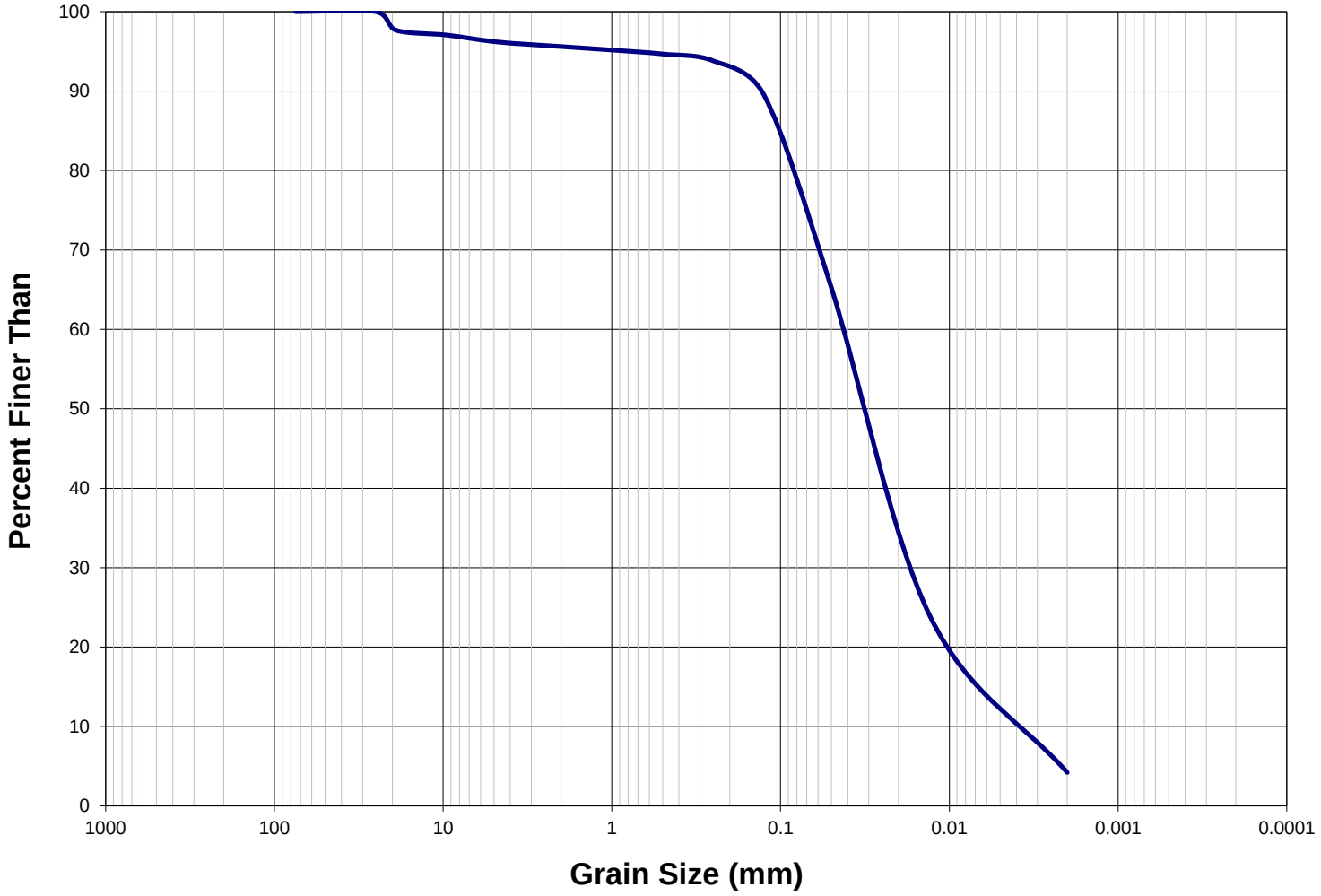
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MBE-5 REP 1
Lab ID: L2170896-13

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	7.61	Clay
64 - 4	3.98	Pebble			
4 - 2	0.41	Granule			
2 - 1	0.44	Very coarse s			
1 - 0.5	0.50	Coarse sand			
0.5 - 0.25	0.87	Medium sand			
0.25 - 0.125	4.35	Fine sand			
0.125 - 0.0625	20.17	Very fine san			
0.0625 - 0.031	25.28	Coarse silt			
0.031 - 0.0156	17.22	Medium silt			
0.0156 - 0.0078	12.20	Fine silt			
0.0078 - 0.0039	6.97	Very fine silt			

Texture: Silt loam

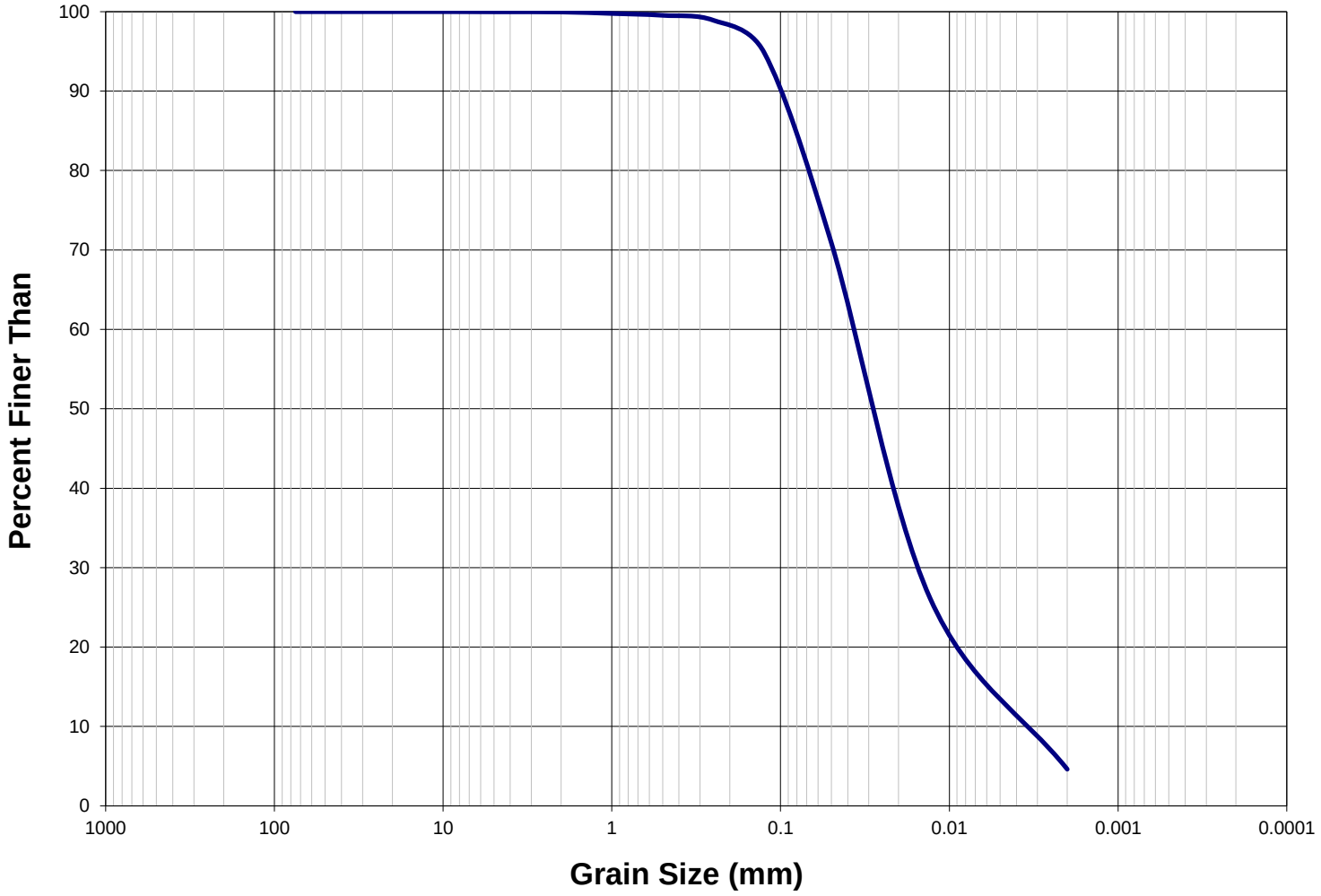
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MBE-5 REP 2
Lab ID: L2170896-14

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	8.34	Clay
64 - 4	0.03	Pebble			
4 - 2	0.01	Granule			
2 - 1	0.19	Very coarse s			
1 - 0.5	0.23	Coarse sand			
0.5 - 0.25	0.63	Medium sand			
0.25 - 0.125	4.08	Fine sand			
0.125 - 0.0625	19.96	Very fine san			
0.0625 - 0.031	26.96	Coarse silt			
0.031 - 0.0156	18.62	Medium silt			
0.0156 - 0.0078	13.32	Fine silt			
0.0078 - 0.0039	7.63	Very fine silt			

Texture: Silt loam

Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
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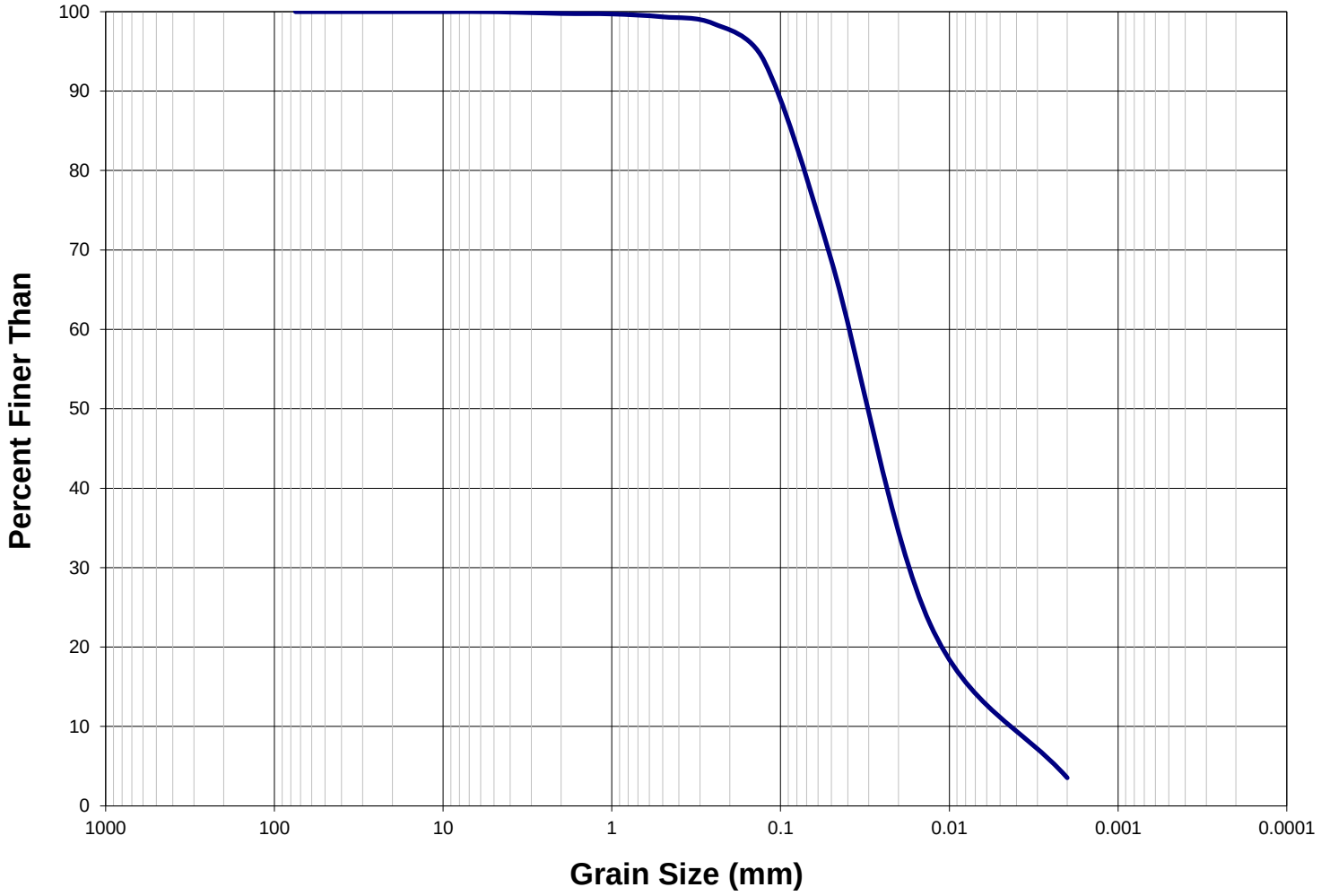
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MBE-5 REP 3
Lab ID: L2170896-15

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	6.88	Clay
64 - 4	0.08	Pebble			
4 - 2	0.15	Granule			
2 - 1	0.06	Very coarse s			
1 - 0.5	0.36	Coarse sand			
0.5 - 0.25	0.85	Medium sand			
0.25 - 0.125	4.73	Fine sand			
0.125 - 0.0625	20.91	Very fine san			
0.0625 - 0.031	27.68	Coarse silt			
0.031 - 0.0156	19.05	Medium silt			
0.0156 - 0.0078	12.38	Fine silt			
0.0078 - 0.0039	6.87	Very fine silt			

Texture: Silt loam

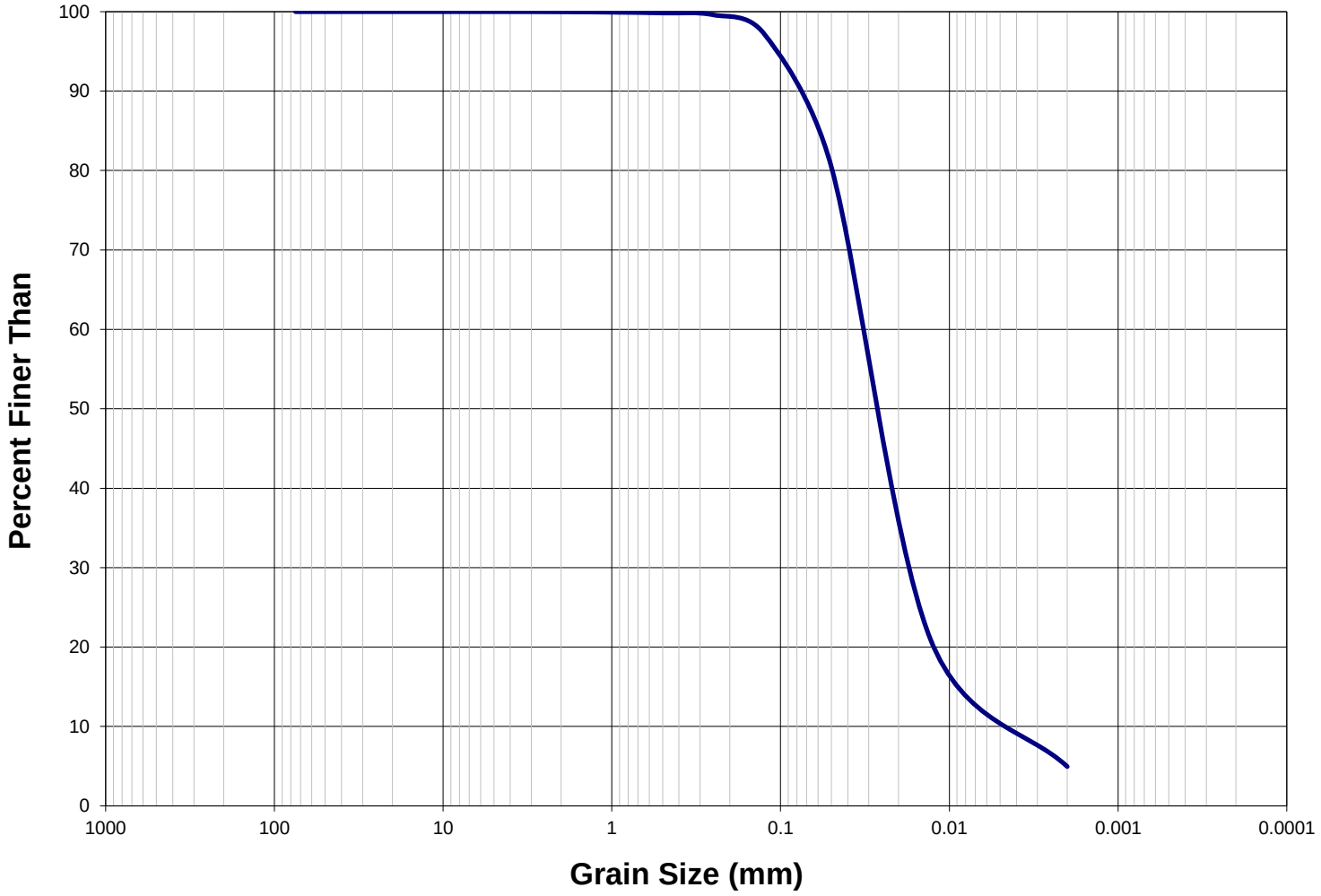
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MB REF A1 REP 1
Lab ID: L2170896-16

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	7.74	Clay
64 - 4	0.01	Pebble			
4 - 2	0.01	Granule			
2 - 1	0.05	Very coarse s			
1 - 0.5	0.10	Coarse sand			
0.5 - 0.25	0.24	Medium sand			
0.25 - 0.125	2.40	Fine sand			
0.125 - 0.0625	13.96	Very fine san			
0.0625 - 0.031	33.27	Coarse silt			
0.031 - 0.0156	24.70	Medium silt			
0.0156 - 0.0078	11.81	Fine silt			
0.0078 - 0.0039	5.73	Very fine silt			

Texture: Silt loam

Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
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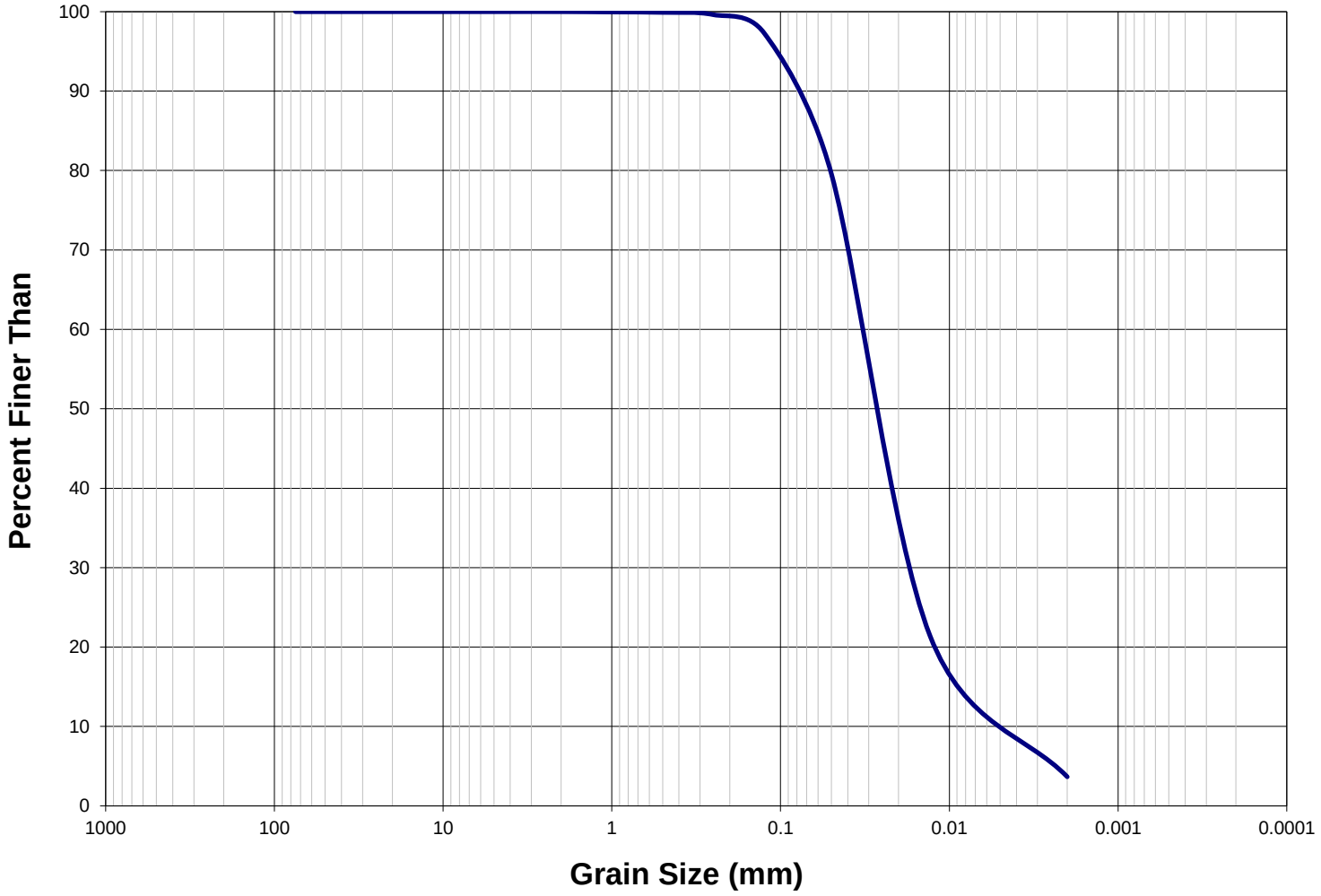
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MB REF A1 REP 2
Lab ID: L2170896-17

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	6.73	Clay
64 - 4	0.00	Pebble			
4 - 2	0.00	Granule			
2 - 1	0.04	Very coarse s			
1 - 0.5	0.05	Coarse sand			
0.5 - 0.25	0.29	Medium sand			
0.25 - 0.125	2.33	Fine sand			
0.125 - 0.0625	14.76	Very fine san			
0.0625 - 0.031	32.83	Coarse silt			
0.031 - 0.0156	24.22	Medium silt			
0.0156 - 0.0078	12.47	Fine silt			
0.0078 - 0.0039	6.29	Very fine silt			

Texture: Silt loam

Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

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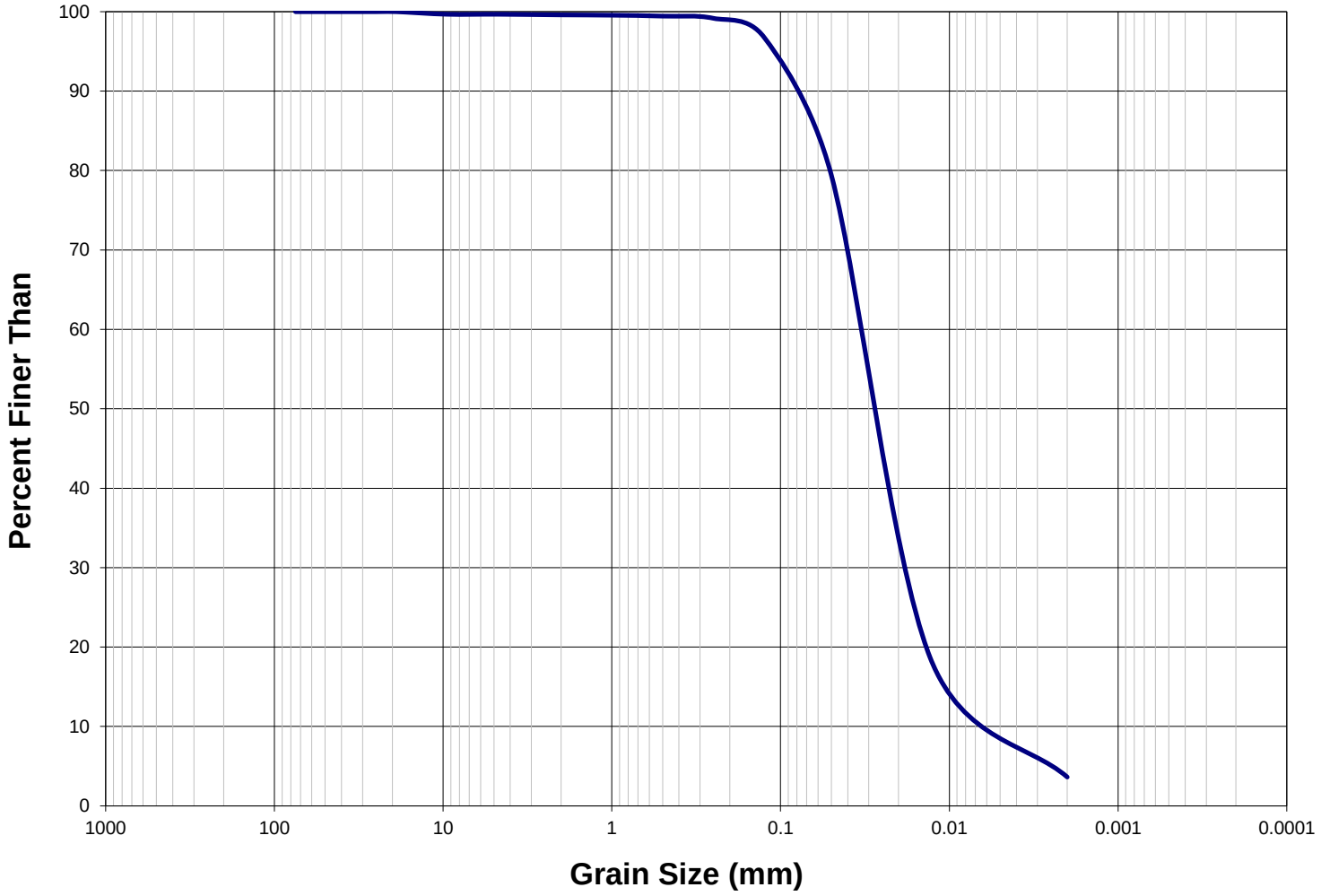
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MB REF A1 REP 3
Lab ID: L2170896-18

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	6.23	Clay
64 - 4	0.35	Pebble			
4 - 2	0.06	Granule			
2 - 1	0.04	Very coarse s			
1 - 0.5	0.11	Coarse sand			
0.5 - 0.25	0.27	Medium sand			
0.25 - 0.125	2.41	Fine sand			
0.125 - 0.0625	14.46	Very fine san			
0.0625 - 0.031	34.07	Coarse silt			
0.031 - 0.0156	25.27	Medium silt			
0.0156 - 0.0078	11.39	Fine silt			
0.0078 - 0.0039	5.34	Very fine silt			

Texture: Silt loam

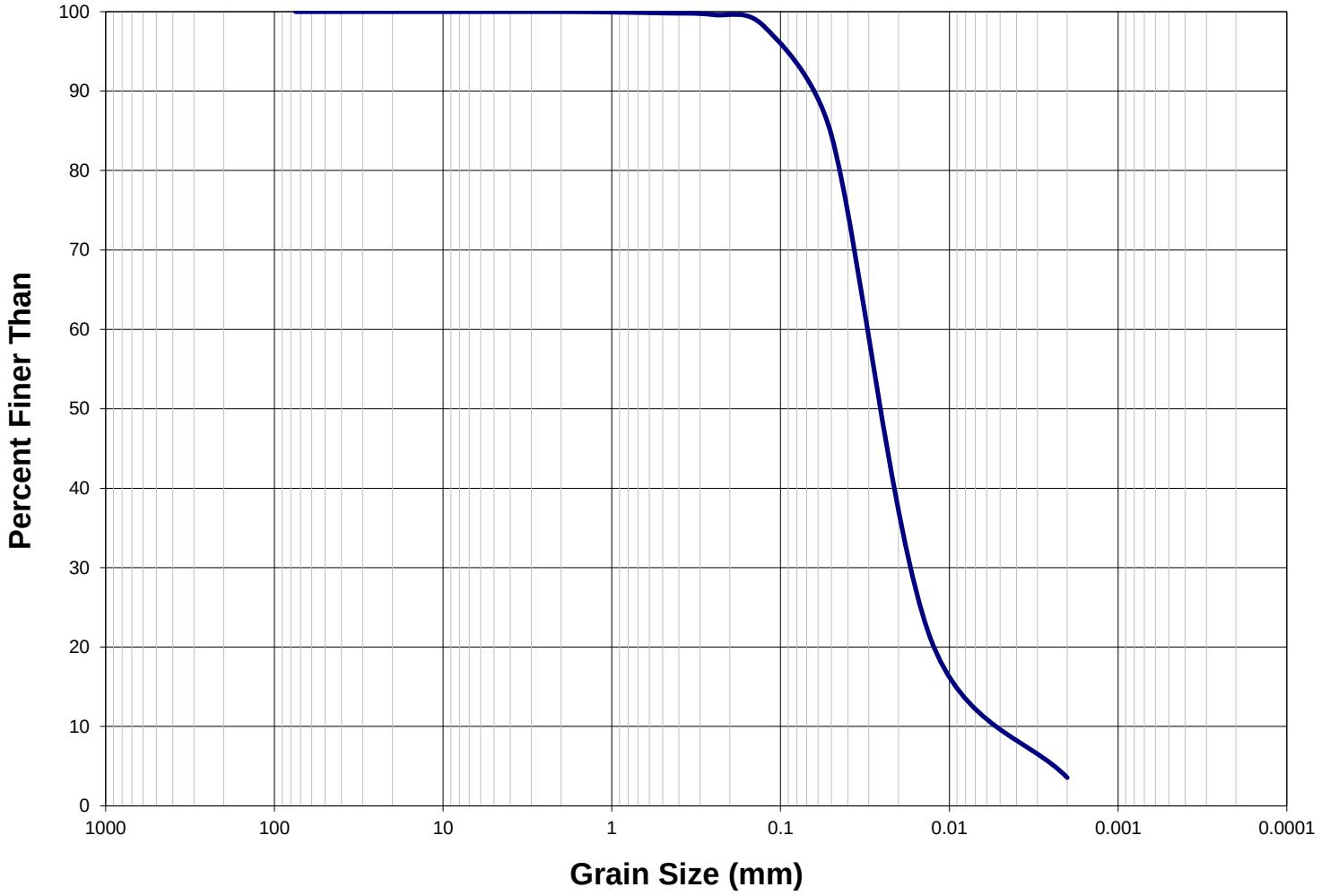
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MB REF A2 REP 1
Lab ID: L2170896-19

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	6.61	Clay
64 - 4	0.00	Pebble			
4 - 2	0.00	Granule			
2 - 1	0.06	Very coarse s			
1 - 0.5	0.12	Coarse sand			
0.5 - 0.25	0.21	Medium sand			
0.25 - 0.125	1.48	Fine sand			
0.125 - 0.0625	11.37	Very fine san			
0.0625 - 0.031	34.75	Coarse silt			
0.031 - 0.0156	26.33	Medium silt			
0.0156 - 0.0078	12.80	Fine silt			
0.0078 - 0.0039	6.27	Very fine silt			

Texture: Silt

Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

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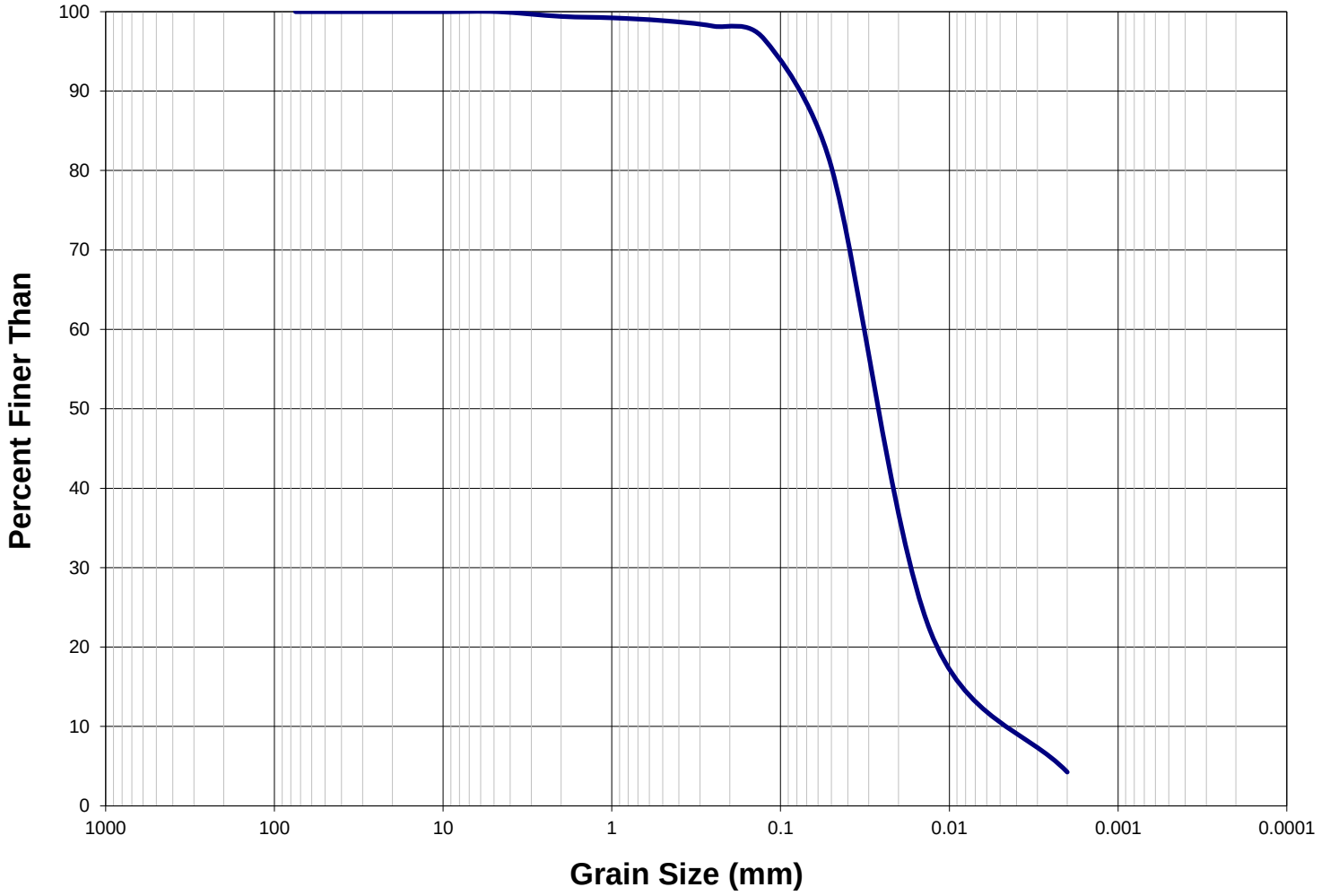
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MBE-1 REP 2
Lab ID: L2170896-2

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	7.34	Clay
64 - 4	0.16	Pebble			
4 - 2	0.43	Granule			
2 - 1	0.18	Very coarse s			
1 - 0.5	0.35	Coarse sand			
0.5 - 0.25	0.70	Medium sand			
0.25 - 0.125	1.64	Fine sand			
0.125 - 0.0625	13.40	Very fine san			
0.0625 - 0.031	32.65	Coarse silt			
0.031 - 0.0156	24.29	Medium silt			
0.0156 - 0.0078	12.53	Fine silt			
0.0078 - 0.0039	6.32	Very fine silt			

Texture: Silt loam

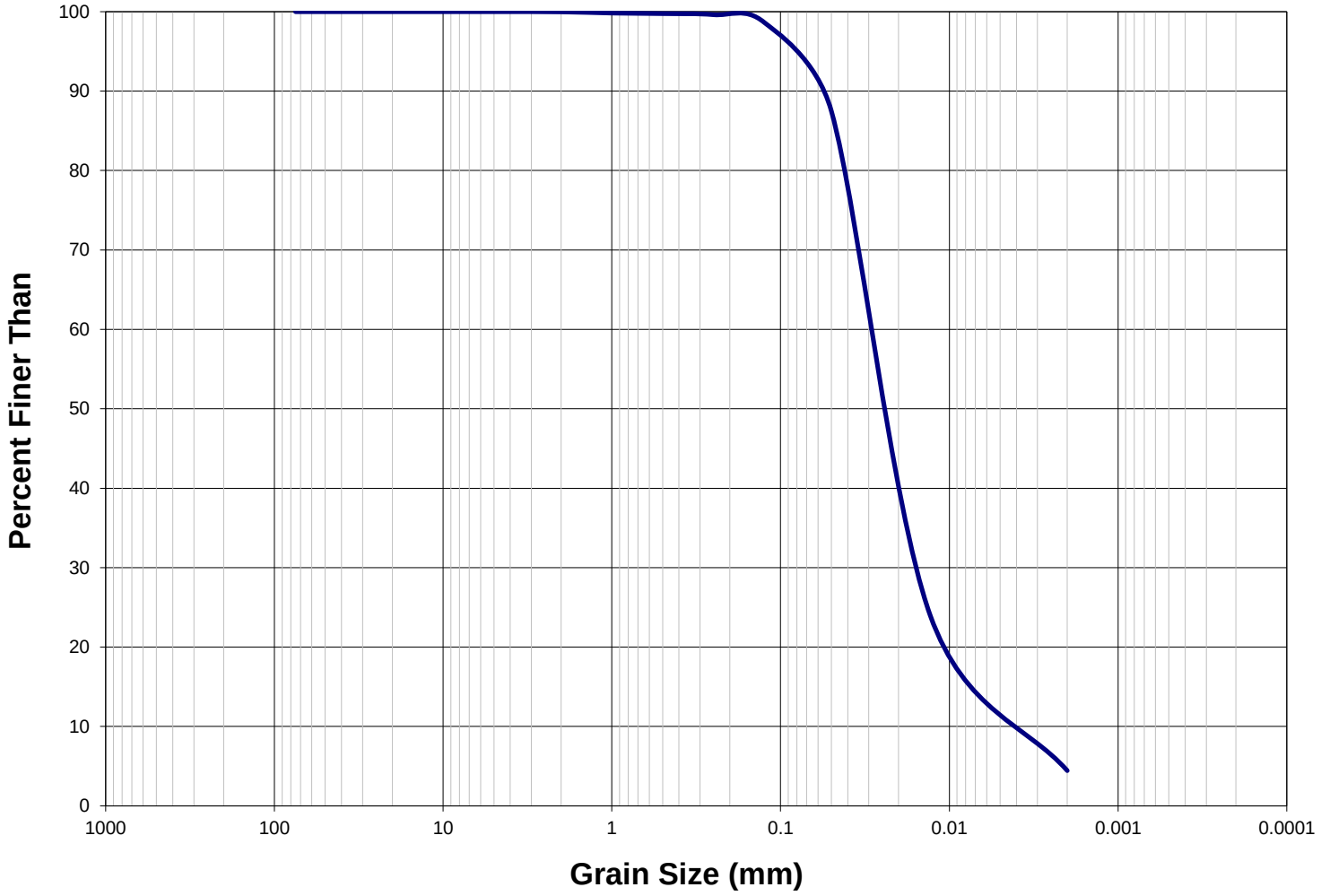
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MB REF A2 REP 2
Lab ID: L2170896-20

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	7.83	Clay
64 - 4	0.01	Pebble			
4 - 2	0.02	Granule			
2 - 1	0.15	Very coarse s			
1 - 0.5	0.07	Coarse sand			
0.5 - 0.25	0.14	Medium sand			
0.25 - 0.125	0.97	Fine sand			
0.125 - 0.0625	9.30	Very fine san			
0.0625 - 0.031	34.44	Coarse silt			
0.031 - 0.0156	26.41	Medium silt			
0.0156 - 0.0078	13.72	Fine silt			
0.0078 - 0.0039	6.95	Very fine silt			

Texture: Silt

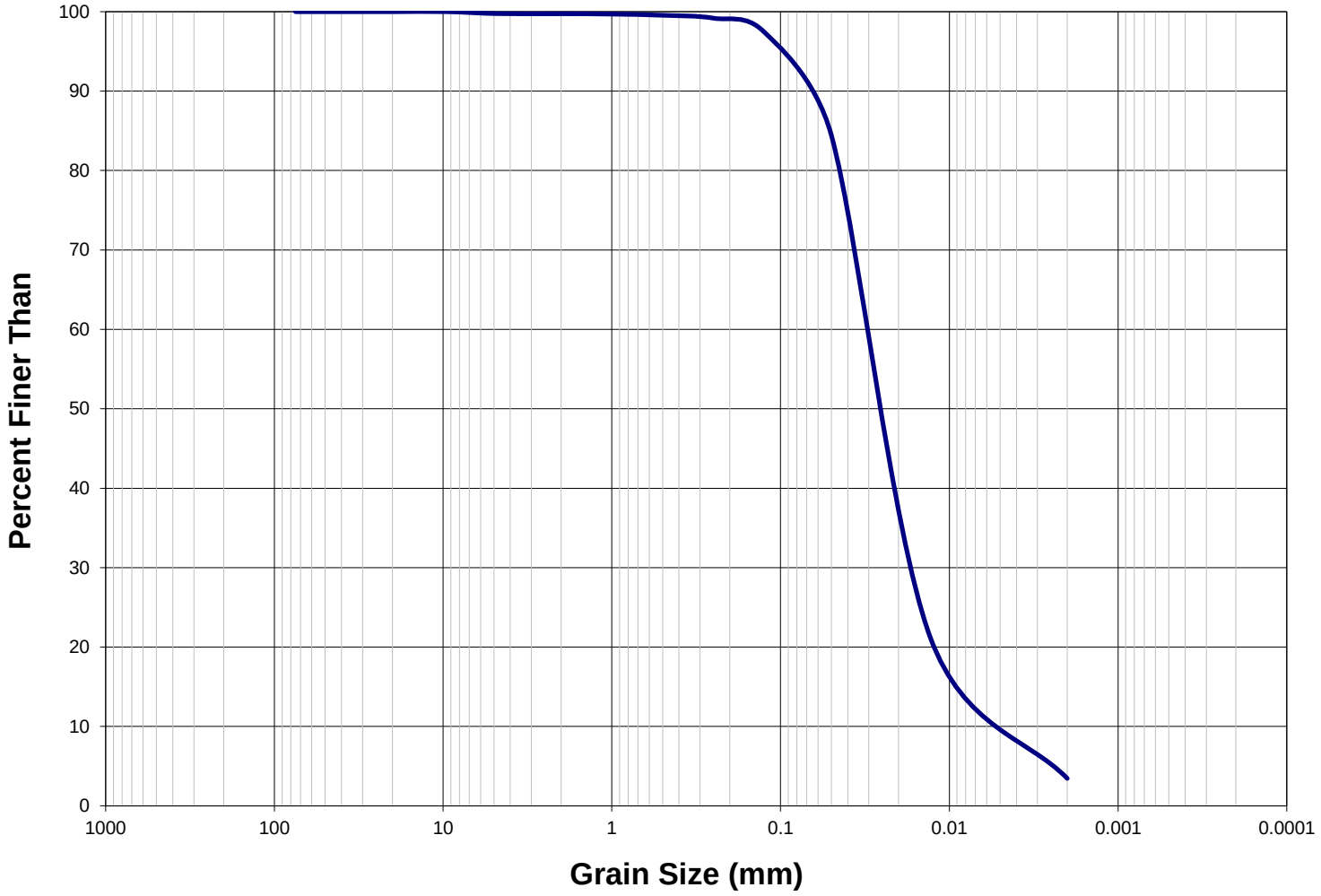
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MB REF A2 REP 3
Lab ID: L2170896-21

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	6.54	Clay
64 - 4	0.25	Pebble			
4 - 2	0.01	Granule			
2 - 1	0.04	Very coarse s			
1 - 0.5	0.15	Coarse sand			
0.5 - 0.25	0.37	Medium sand			
0.25 - 0.125	1.75	Fine sand			
0.125 - 0.0625	10.83	Very fine san			
0.0625 - 0.031	34.59	Coarse silt			
0.031 - 0.0156	26.28	Medium silt			
0.0156 - 0.0078	12.86	Fine silt			
0.0078 - 0.0039	6.32	Very fine silt			

Texture: Silt

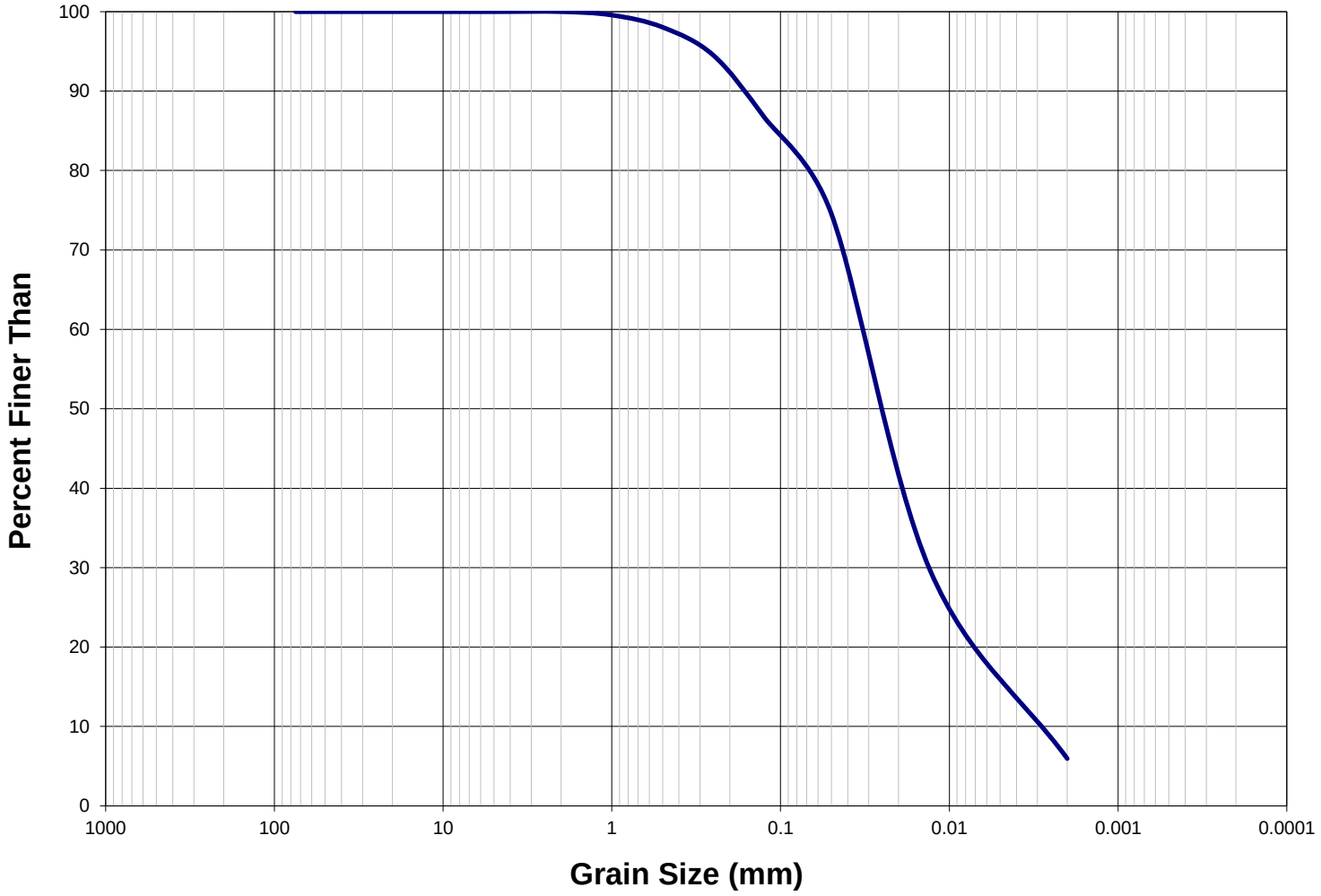
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MB REF A3 REP 1
Lab ID: L2170896-22

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	10.05	Clay
64 - 4	0.00	Pebble			
4 - 2	0.00	Granule			
2 - 1	0.43	Very coarse s			
1 - 0.5	1.53	Coarse sand			
0.5 - 0.25	3.54	Medium sand			
0.25 - 0.125	7.78	Fine sand			
0.125 - 0.0625	10.13	Very fine san			
0.0625 - 0.031	25.08	Coarse silt			
0.031 - 0.0156	18.68	Medium silt			
0.0156 - 0.0078	14.36	Fine silt			
0.0078 - 0.0039	8.41	Very fine silt			

Texture: Silt loam

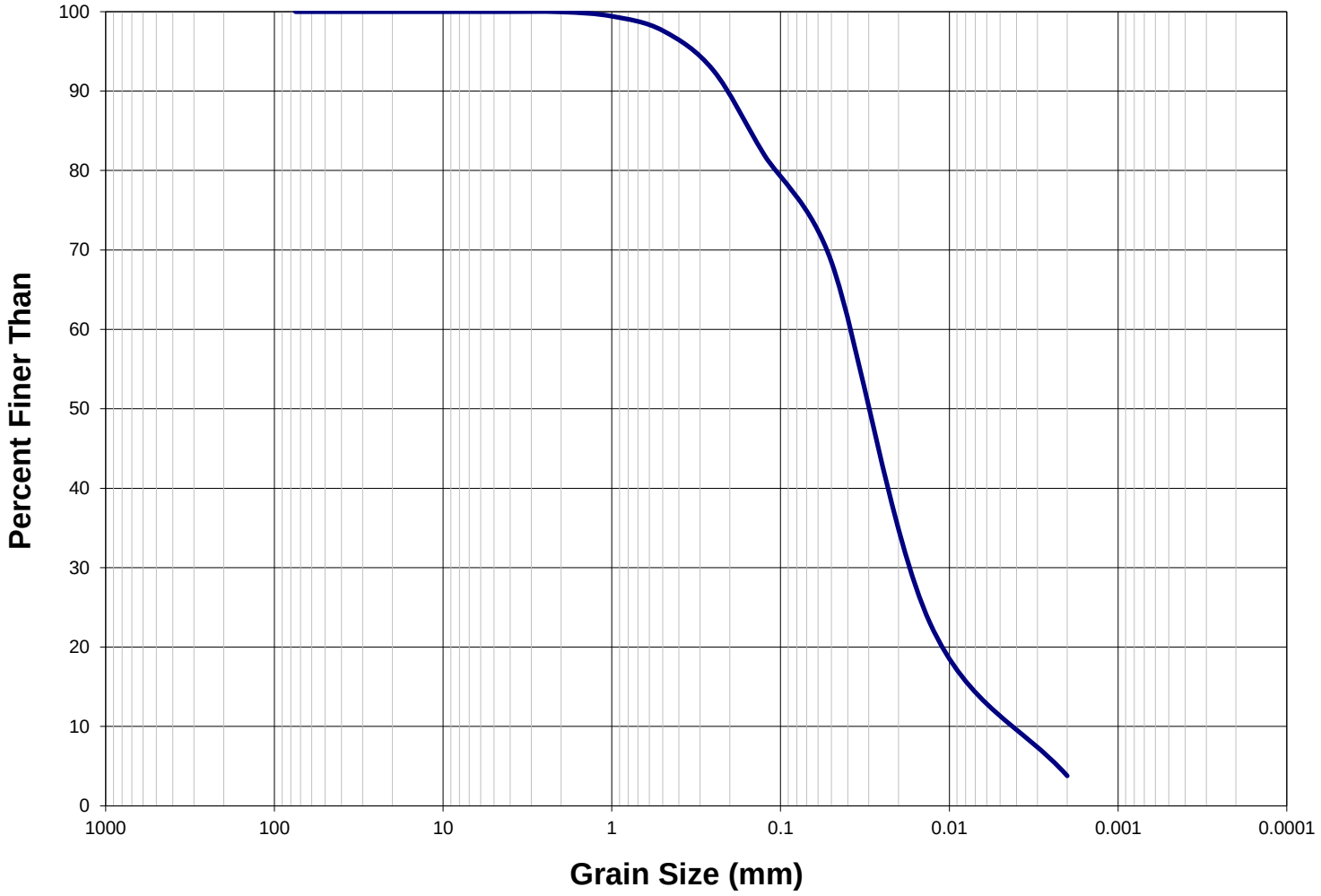
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MB REF A3 REP 2
Lab ID: L2170896-23

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	7.10	Clay
64 - 4	0.01	Pebble			
4 - 2	0.02	Granule			
2 - 1	0.55	Very coarse s			
1 - 0.5	1.80	Coarse sand			
0.5 - 0.25	5.03	Medium sand			
0.25 - 0.125	10.62	Fine sand			
0.125 - 0.0625	11.22	Very fine san			
0.0625 - 0.031	25.62	Coarse silt			
0.031 - 0.0156	18.95	Medium silt			
0.0156 - 0.0078	12.28	Fine silt			
0.0078 - 0.0039	6.81	Very fine silt			

Texture: Silt loam

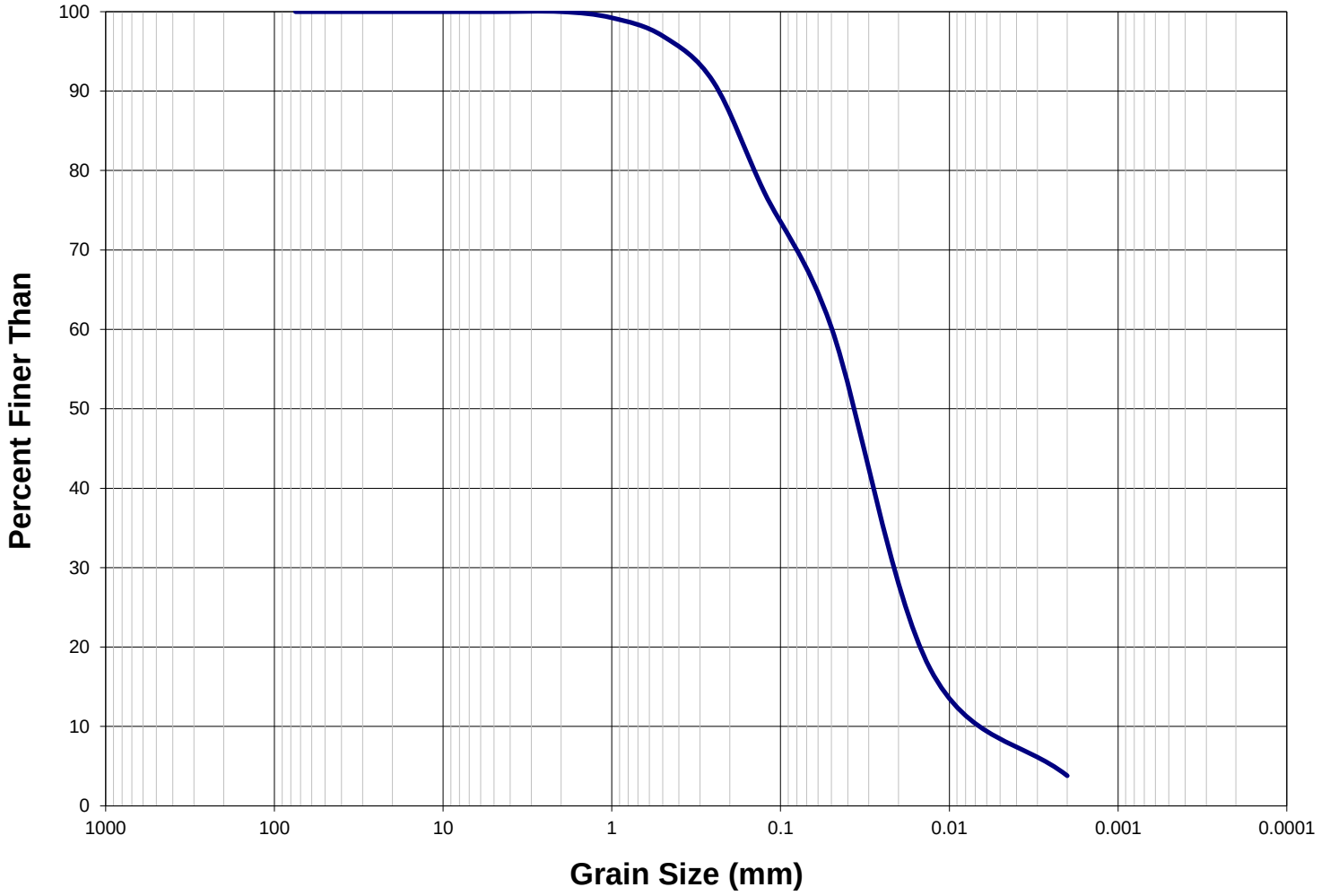
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MB REF A3 REP 3
Lab ID: L2170896-24

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	6.13	Clay
64 - 4	0.00	Pebble			
4 - 2	0.00	Granule			
2 - 1	0.77	Very coarse s			
1 - 0.5	2.28	Coarse sand			
0.5 - 0.25	5.80	Medium sand			
0.25 - 0.125	13.86	Fine sand			
0.125 - 0.0625	14.20	Very fine san			
0.0625 - 0.031	24.90	Coarse silt			
0.031 - 0.0156	17.88	Medium silt			
0.0156 - 0.0078	9.39	Fine silt			
0.0078 - 0.0039	4.78	Very fine silt			

Texture: Silt loam

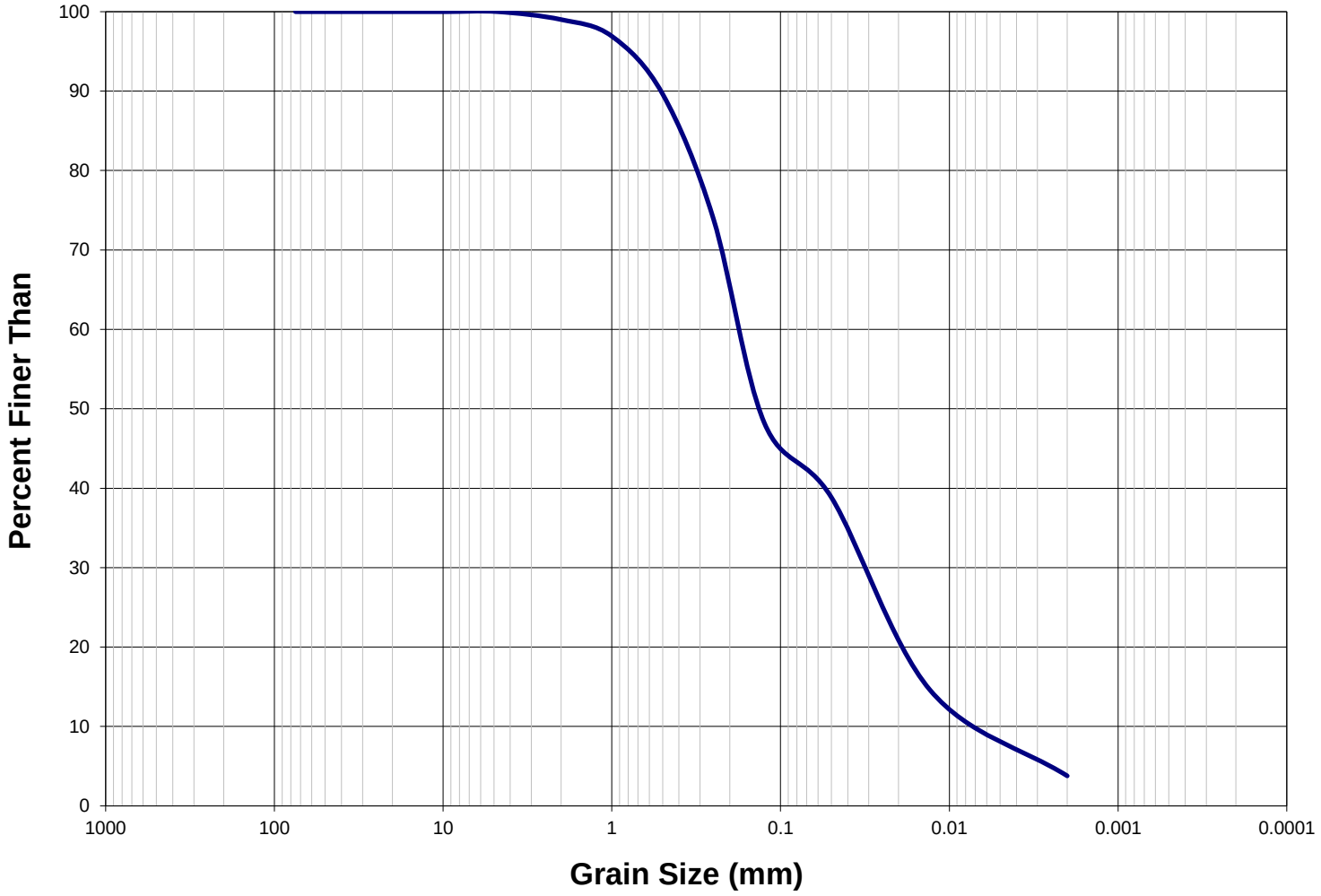
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MB REF 1
Lab ID: L2170896-25

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	5.65	Clay
64 - 4	0.27	Pebble			
4 - 2	0.72	Granule			
2 - 1	2.10	Very coarse s			
1 - 0.5	7.28	Coarse sand			
0.5 - 0.25	15.71	Medium sand			
0.25 - 0.125	25.66	Fine sand			
0.125 - 0.0625	7.84	Very fine san			
0.0625 - 0.031	14.03	Coarse silt			
0.031 - 0.0156	10.10	Medium silt			
0.0156 - 0.0078	6.81	Fine silt			
0.0078 - 0.0039	3.83	Very fine silt			

Texture: Sandy loam

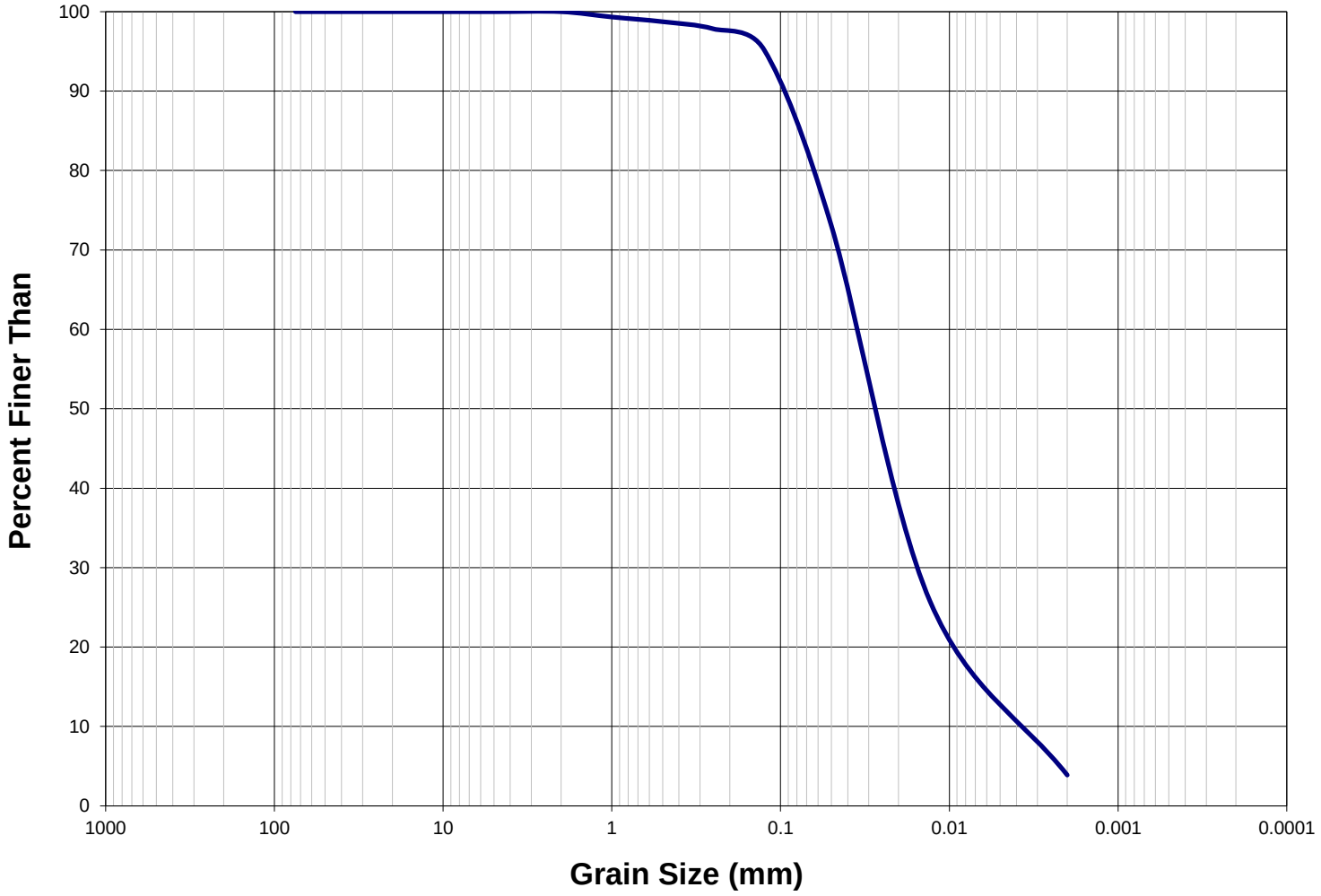
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: DUP A
Lab ID: L2170896-26

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	7.66	Clay
64 - 4	0.00	Pebble			
4 - 2	0.00	Granule			
2 - 1	0.67	Very coarse s			
1 - 0.5	0.59	Coarse sand			
0.5 - 0.25	0.90	Medium sand			
0.25 - 0.125	2.66	Fine sand			
0.125 - 0.0625	18.44	Very fine san			
0.0625 - 0.031	27.97	Coarse silt			
0.031 - 0.0156	19.68	Medium silt			
0.0156 - 0.0078	13.66	Fine silt			
0.0078 - 0.0039	7.75	Very fine silt			

Texture: Silt loam

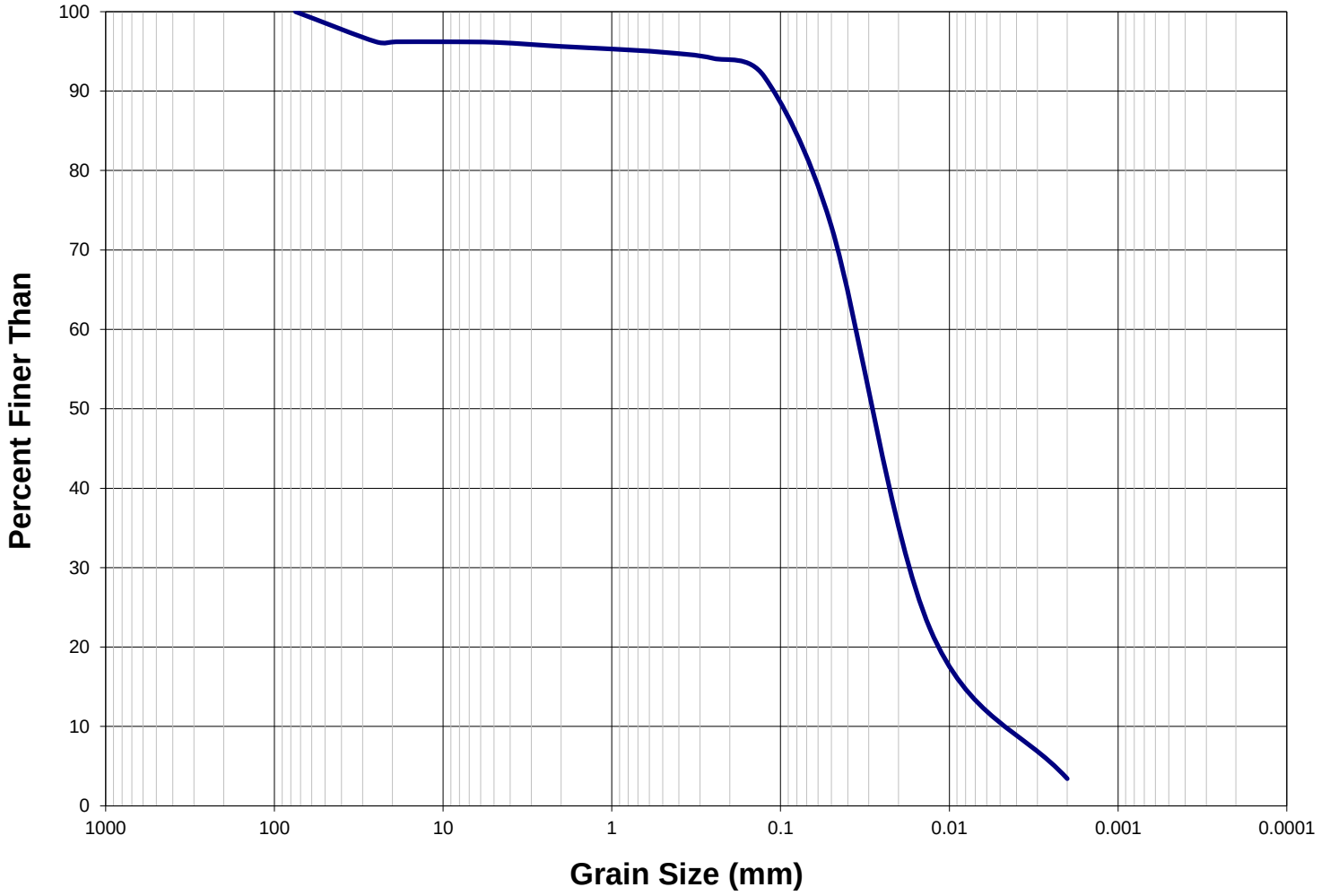
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MBE-1 REP 3
Lab ID: L2170896-3

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.83	Cobble	<0.0039	6.69	Clay
64 - 4	3.18	Pebble			
4 - 2	0.36	Granule			
2 - 1	0.33	Very coarse s			
1 - 0.5	0.40	Coarse sand			
0.5 - 0.25	0.78	Medium sand			
0.25 - 0.125	2.28	Fine sand			
0.125 - 0.0625	15.72	Very fine san			
0.0625 - 0.031	29.17	Coarse silt			
0.031 - 0.0156	21.10	Medium silt			
0.0156 - 0.0078	12.47	Fine silt			
0.0078 - 0.0039	6.68	Very fine silt			

Texture: Silt loam

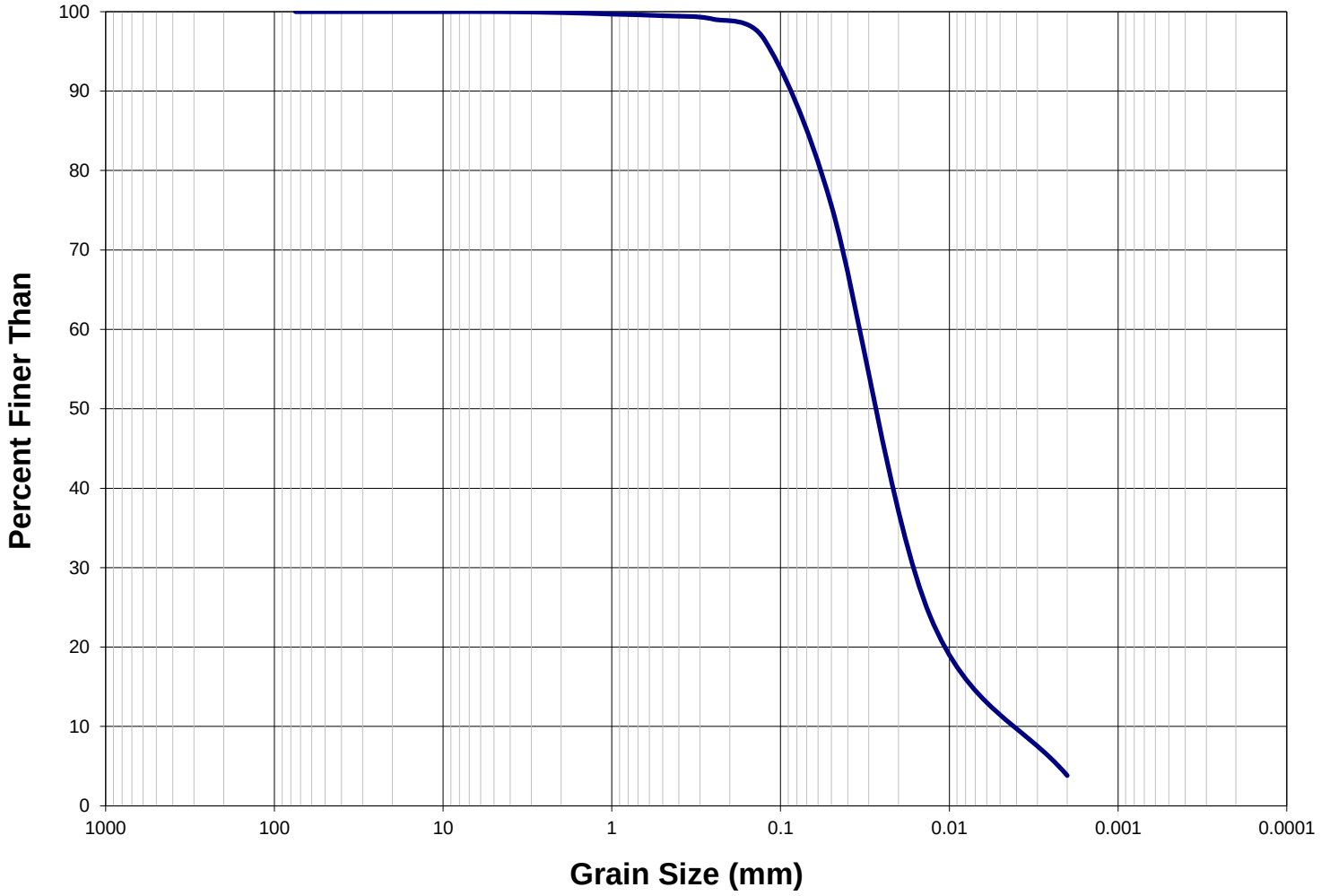
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MBE-2 REP 1
Lab ID: L2170896-4

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	7.29	Clay
64 - 4	0.03	Pebble			
4 - 2	0.09	Granule			
2 - 1	0.19	Very coarse s			
1 - 0.5	0.20	Coarse sand			
0.5 - 0.25	0.44	Medium sand			
0.25 - 0.125	2.54	Fine sand			
0.125 - 0.0625	17.42	Very fine san			
0.0625 - 0.031	30.03	Coarse silt			
0.031 - 0.0156	21.52	Medium silt			
0.0156 - 0.0078	13.13	Fine silt			
0.0078 - 0.0039	7.12	Very fine silt			

Texture: Silt loam

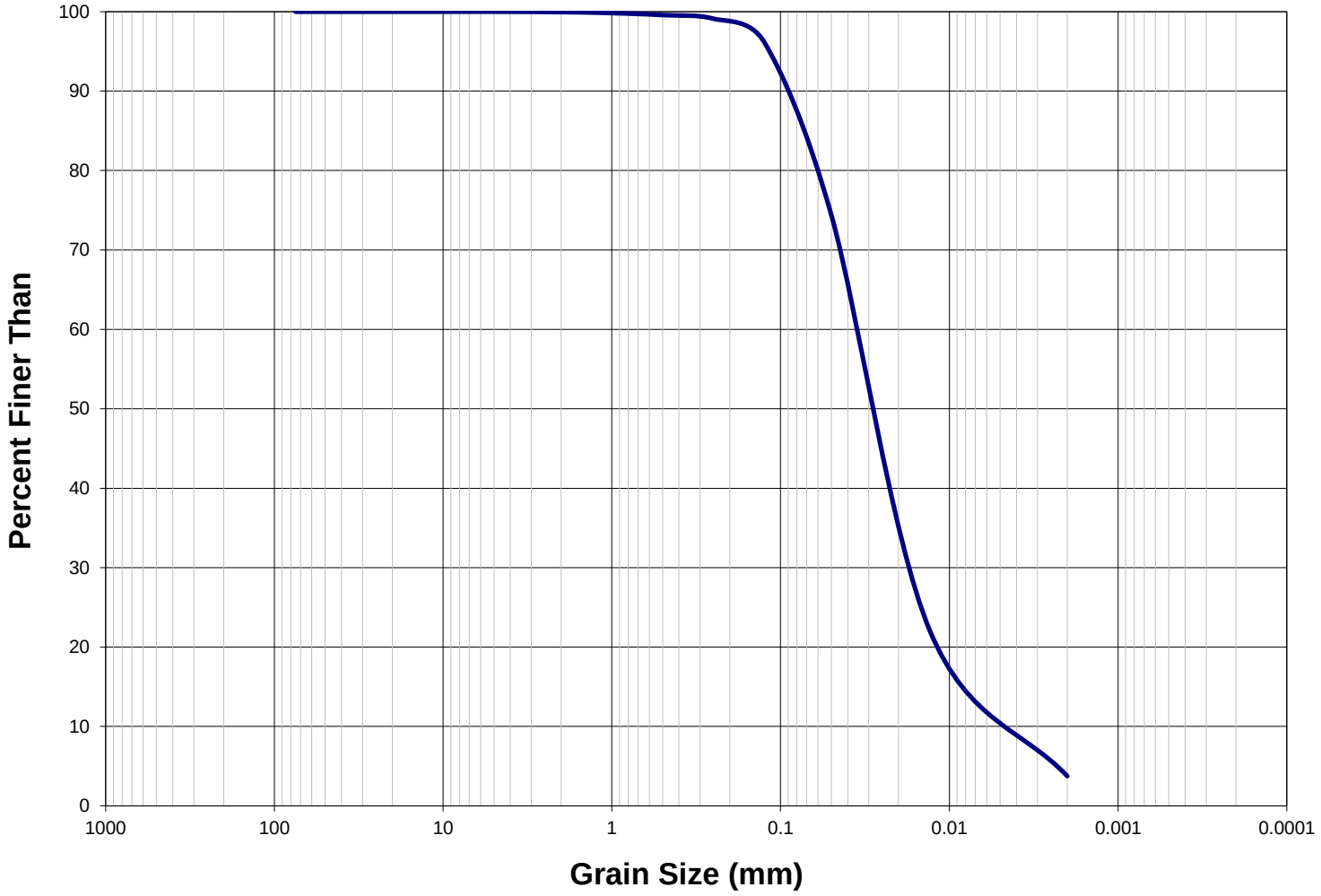
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MBE-2 REP 2
Lab ID: L2170896-5

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	6.91	Clay
64 - 4	0.01	Pebble			
4 - 2	0.03	Granule			
2 - 1	0.13	Very coarse s			
1 - 0.5	0.25	Coarse sand			
0.5 - 0.25	0.47	Medium sand			
0.25 - 0.125	2.95	Fine sand			
0.125 - 0.0625	18.15	Very fine san			
0.0625 - 0.031	30.53	Coarse silt			
0.031 - 0.0156	21.80	Medium silt			
0.0156 - 0.0078	12.30	Fine silt			
0.0078 - 0.0039	6.47	Very fine silt			

Texture: Silt loam

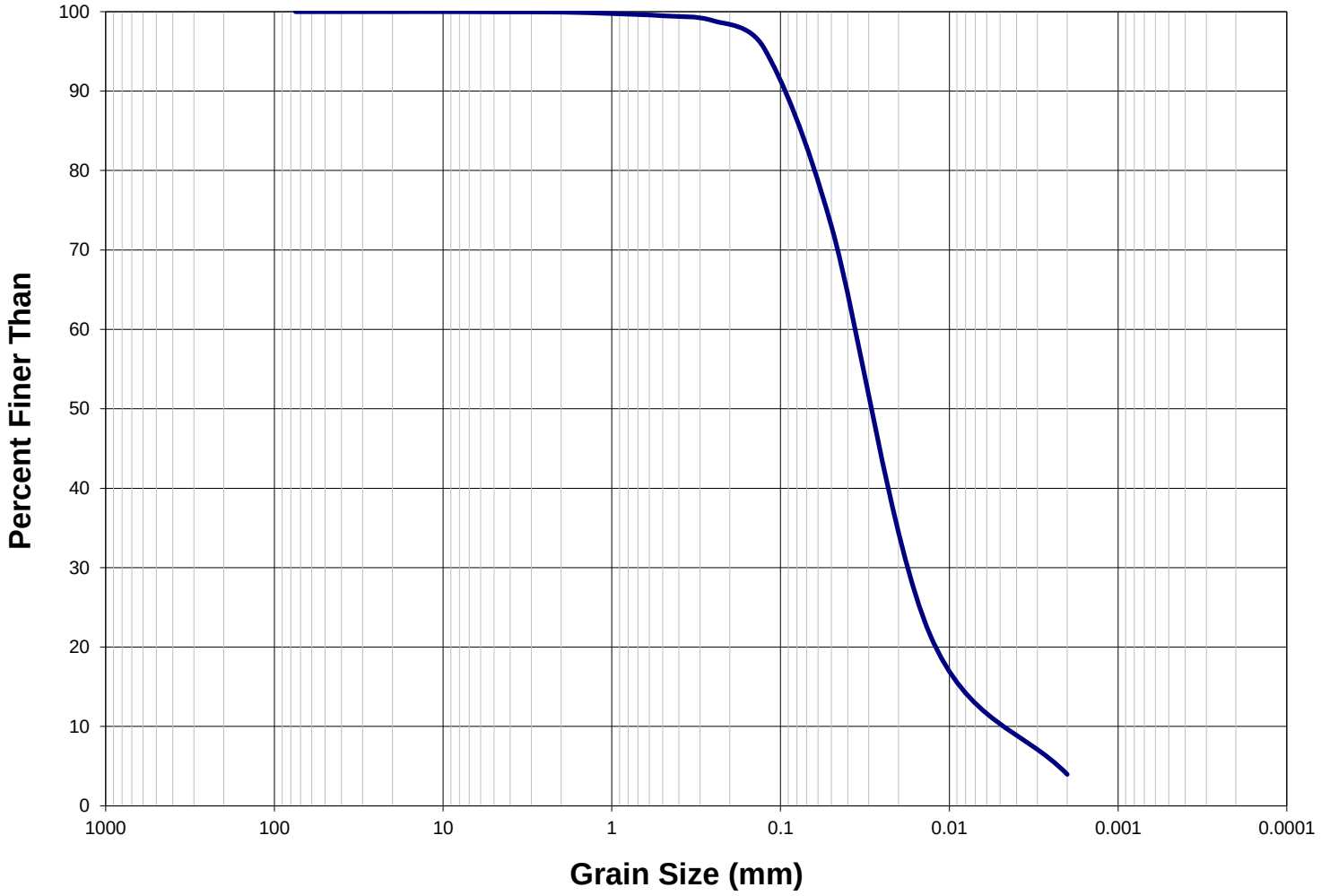
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MBE-2 REP 3
Lab ID: L2170896-6

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	7.00	Clay
64 - 4	0.04	Pebble			
4 - 2	0.02	Granule			
2 - 1	0.18	Very coarse s			
1 - 0.5	0.28	Coarse sand			
0.5 - 0.25	0.63	Medium sand			
0.25 - 0.125	3.47	Fine sand			
0.125 - 0.0625	18.63	Very fine san			
0.0625 - 0.031	30.16	Coarse silt			
0.031 - 0.0156	21.43	Medium silt			
0.0156 - 0.0078	11.92	Fine silt			
0.0078 - 0.0039	6.23	Very fine silt			

Texture: Silt loam

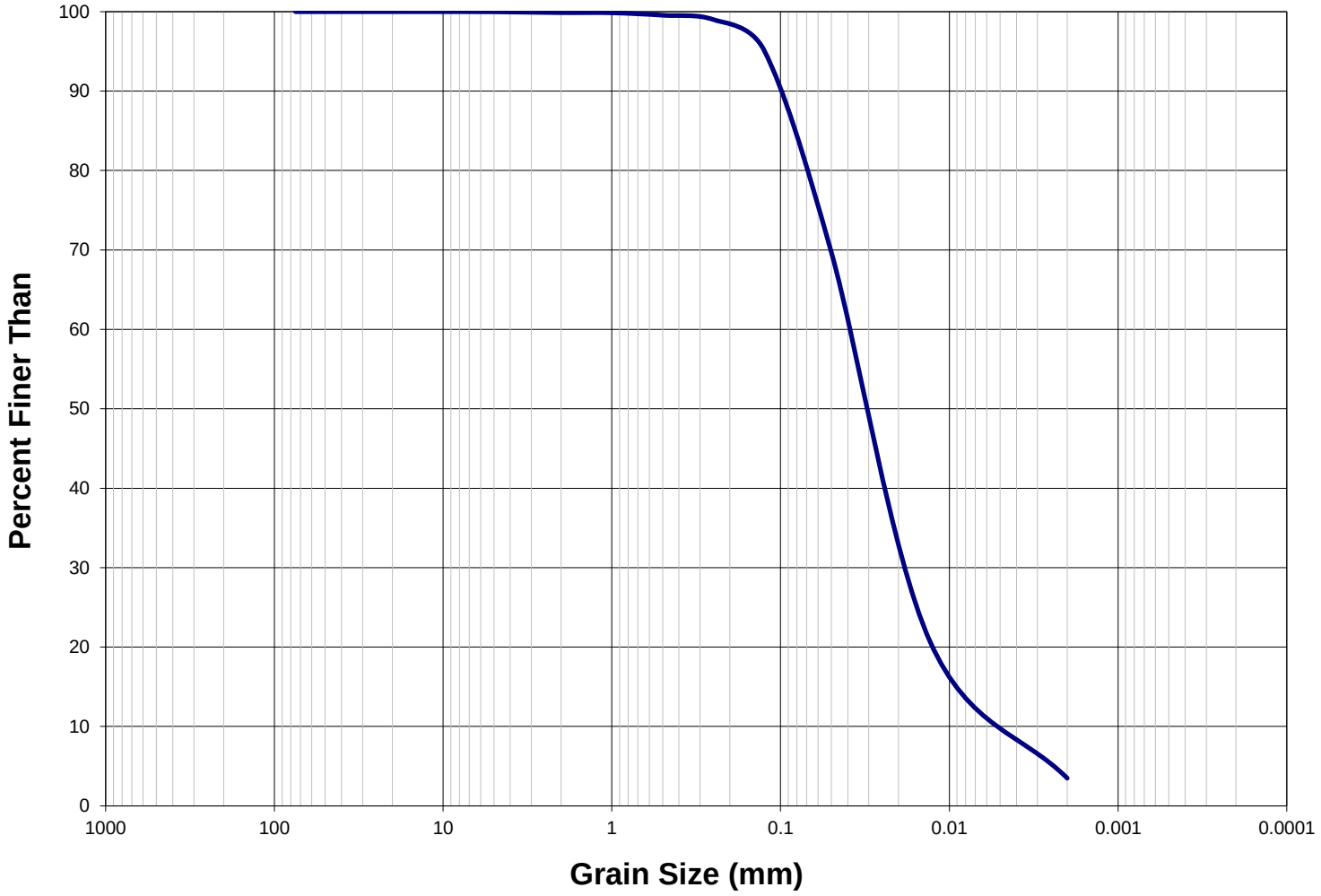
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MBE-3 REP 1
Lab ID: L2170896-7

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	6.46	Clay
64 - 4	0.05	Pebble			
4 - 2	0.07	Granule			
2 - 1	0.02	Very coarse s			
1 - 0.5	0.31	Coarse sand			
0.5 - 0.25	0.55	Medium sand			
0.25 - 0.125	3.89	Fine sand			
0.125 - 0.0625	21.18	Very fine san			
0.0625 - 0.031	29.40	Coarse silt			
0.031 - 0.0156	20.40	Medium silt			
0.0156 - 0.0078	11.57	Fine silt			
0.0078 - 0.0039	6.10	Very fine silt			

Texture: Silt loam

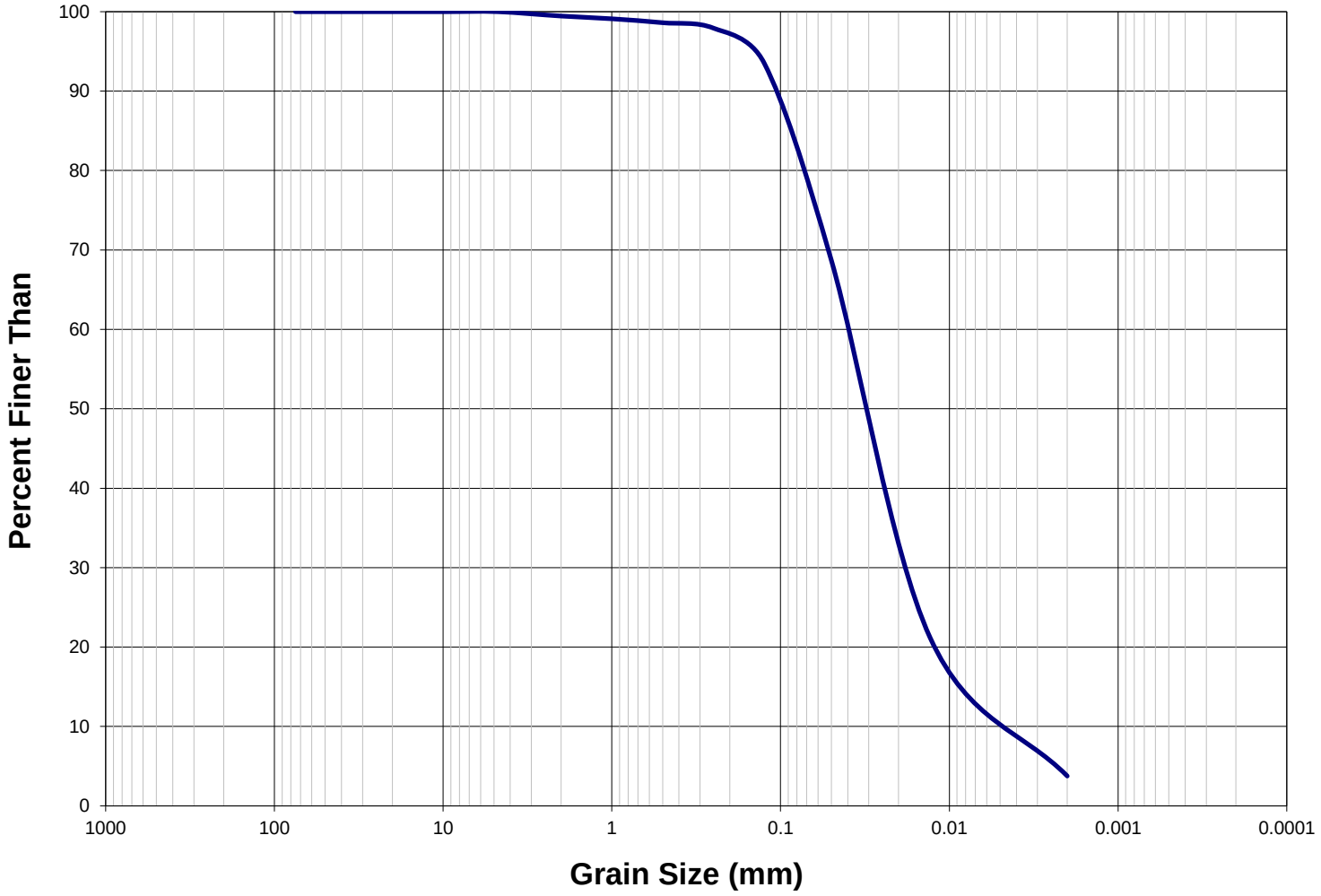
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MBE-3 REP 2
Lab ID: L2170896-8

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	6.77	Clay
64 - 4	0.15	Pebble			
4 - 2	0.40	Granule			
2 - 1	0.35	Very coarse s			
1 - 0.5	0.49	Coarse sand			
0.5 - 0.25	0.68	Medium sand			
0.25 - 0.125	4.41	Fine sand			
0.125 - 0.0625	20.69	Very fine san			
0.0625 - 0.031	28.53	Coarse silt			
0.031 - 0.0156	19.77	Medium silt			
0.0156 - 0.0078	11.58	Fine silt			
0.0078 - 0.0039	6.18	Very fine silt			

Texture: Silt loam

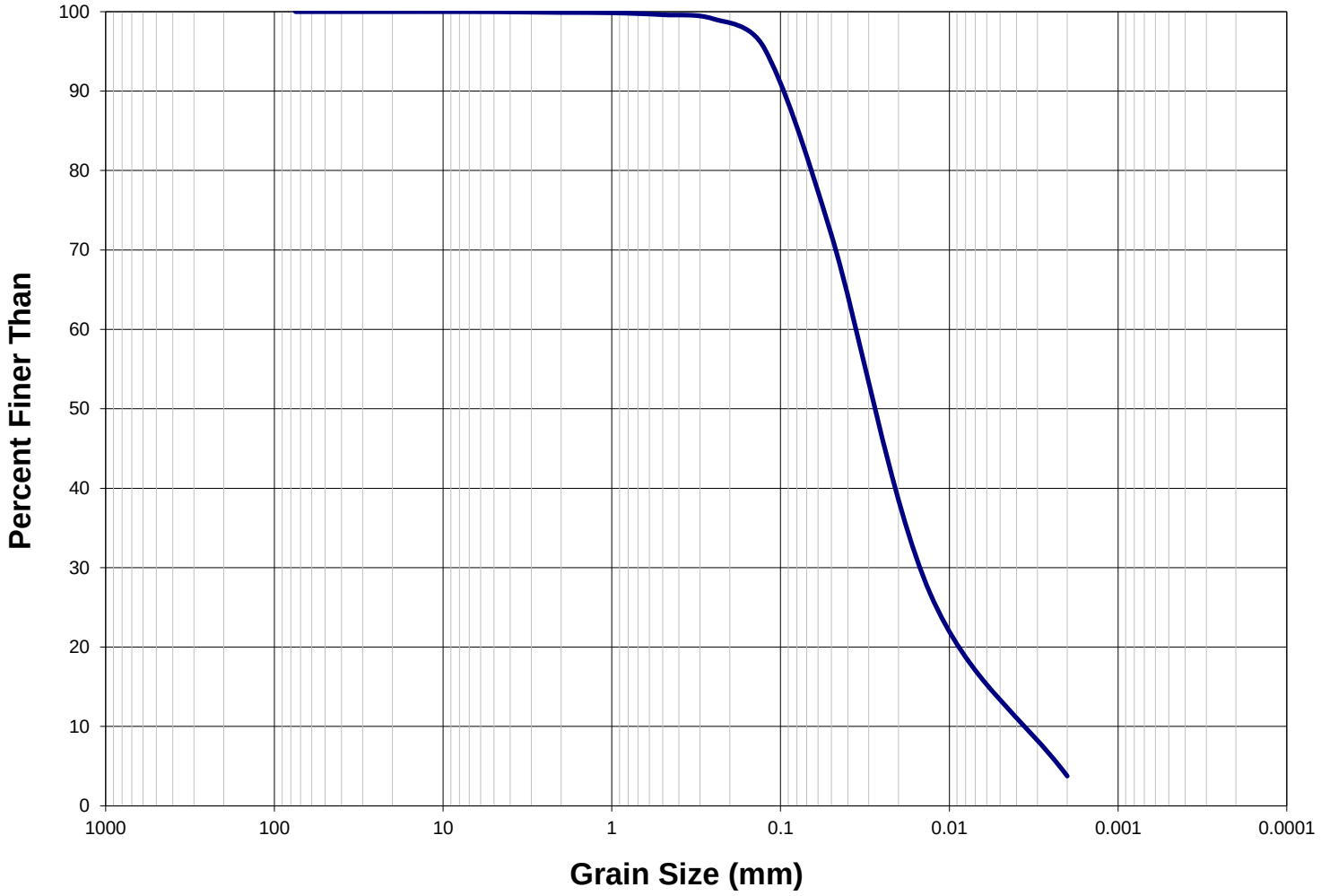
Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5

Client Name: Agnico-Eagle - Meliadine Gold Project
Project:
Sample ID: MBE-3 REP 3
Lab ID: L2170896-9

Particle Size Distribution Curve



Particle Size Distribution

Range (mm)	Wt. (%)	Class	Range (mm)	Wt. (%)	Class
> 64	0.00	Cobble	<0.0039	7.73	Clay
64 - 4	0.04	Pebble			
4 - 2	0.06	Granule			
2 - 1	0.04	Very coarse s			
1 - 0.5	0.24	Coarse sand			
0.5 - 0.25	0.52	Medium sand			
0.25 - 0.125	3.68	Fine sand			
0.125 - 0.0625	19.59	Very fine san			
0.0625 - 0.031	27.10	Coarse silt			
0.031 - 0.0156	18.79	Medium silt			
0.0156 - 0.0078	14.05	Fine silt			
0.0078 - 0.0039	8.16	Very fine silt			

Texture: Silt loam

Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L2170896-COFC

COC Number: 14 - 452766

Page 1 of 3

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Agnico Eagle Mines	Select Report Format:	☑ PDF ☐ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3pm)
Contact:	Jennifer Brown	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐ Priority (2-4 business days if received by 3pm)
Address:	Meliadine, Rankin Inlet, NU X0C 0G	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 business days if received by 3pm)
Phone:	1-819-759-7555 ext 4603996	Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency if received by 10am – contact ALS for surcharge.
		Email 1 or Fax	arman_ospan@golder.com	Specify Date Required for E2,E or P:
		Email 2	erichard@golder.com	

Invoice To		Invoice Distribution	
	Same as Report To ☑ Yes ☐ No	Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
	Copy of Invoice with Report ☑ Yes ☐ No	Email 1 or Fax	invoices.meliadine@agnico.eagle.com
Company:	Agnico Eagle & Golder	Email 2	carolina-lesseigneur-torres@golder.com
Contact:			

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q 69808	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		ALS Contact:	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	TOC	Total Metals	Diss. Metals	Total + Diss Nutrients	Total + Diss Hg	PSA (Westworth)	Date	Number of Containers
	MBE-1 Rep1	13-Sep-18	17:00	marine sediment	X	X	X	X	X	X		
	MBE-1 Rep2				X	X	X	X	X	X		
	MBE-1 Rep3				X	X	X	X	X	X		
	MBE-2 Rep1		16:00		X	X	X	X	X	X		
	MBE-2 Rep2				X	X	X	X	X	X		
	MBE-2 Rep3				X	X	X	X	X	X		
	MBE-3 Rep1	13 Sep 18	15:00		X	X	X	X	X	X		
	MBE-3 Rep2				X	X	X	X	X	X		
	MBE-3 Rep3				X	X	X	X	X	X		
	MBE-4 Rep1	13 Sep 2018	14:00		X	X	X	X	X	X		
	MBE-4 Rep2				X	X	X	X	X	X		
	MBE-4 Rep3				X	X	X	X	X	X		

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	CCME criteria ; contact erichard@golder.com for FINAL ANALYSES
Are samples for human drinking water use? ☐ Yes ☑ No	Report to: agnico_equis@golder.com

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		
				16	

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:
Andrew Rippington	Sept 20/18	20:00				JC	SEP 26 2018	9Am

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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NA-FM-0326e v08 Front/Back October 2013

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**.

White Paper Co. 604 951 3900

ALS Environmental
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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L2170896-COFC

COC Number: 14 - 452767

Page 2 of 3

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Agnico Eagle Mines	Select Report Format:	☑ PDF ☐ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3pm)
Contact:	Jennifer Brown	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐ Priority (2-4 business days if received by 3pm)
Address:	Meliadine, Rankin Inlet, NV X0C0G0	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 business days if received by 3pm)
		Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency if received by 10am – contact ALS for surcharge.
Phone:	1-819-759-7555 ext. 4603996	Email 1 or Fax	grman-ospqa@golder.com	Specify Date Required for E2,E or P:
		Email 2	erichard@golder.com	

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:	Agnico Eagle-Golder	Email 1 or Fax	invoices.meliadine@agnico.eagle.com	
Contact:		Email 2	Caroline-leseigneurtorres@golder.com	

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q 69808	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only)	ALS Contact:	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	TOC	Total Metals	Nutrients	PSA (Quantum)	Number of Containers
	MBE-5 Rep1	13-Sep-18	12:20	Marine sediment	X	X	X	X	
	MBE-5 Rep2	↓	↓		X	X	X	X	
	MBE-5 Rep3	↓	↓		X	X	X	X	
	MBReg A1 Rep1	19-Sep-18	08:30		X	X	X	X	
	MBReg A1 Rep2	↓	↓		X	X	X	X	
	MB Reg A1 Rep3	↓	↓		X	X	X	X	
	MB Reg A2 Rep1	19-Sep-18	09:30		X	X	X	X	
	MB Reg A2 Rep2	↓	↓		X	X	X	X	
	MB Reg A2 Rep3	↓	↓		X	X	X	X	
	MB Reg A3 Rep1	19-Sep-18	12:00		X	X	X	X	
	MB Rep A3 Rep2	↓	↓		X	X	X	X	
	MB Rep A3 Rep3	↓	↓		X	X	X	X	

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	CCME: criteria: contact erichard@golder.com for FINAL analysis
Are samples for human drinking water use? ☐ Yes ☑ No	Report To: agnico_eqwis@golder.com

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		
				16	

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:
Andrew Rippington	Sept 24/18	20:00				JC	SEP 26 2018	9am

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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NA-FM-0326a v08 Front/03 October 2013

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

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Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L2170896-COFC

COC Number: 14 - 452768

Page 3 of 3

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Agnico Eagle Mines	Select Report Format:	☑ PDF ☐ EXCEL ☐ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3pm)
Contact:	Jennifer Brown	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐ Priority (2-4 business days if received by 3pm)
Address:	Meliadine, Rankin Inlet, NU X0C 0G0	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 business days if received by 3pm)
		Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency if received by 10am – contact ALS for surcharge.
Phone:	819-759-7555 ext 4603996	Email 1 or Fax	arman_dspan@golder.com	Specify Date Required for E2,E or P:
		Email 2	erichard@golder.com	

Invoice To		Invoice Distribution	
	Same as Report To ☑ Yes ☐ No	Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
	Copy of Invoice with Report ☑ Yes ☐ No	Email 1 or Fax	invoices.meliadine@agnico.eagle.com
Company:	Agnico Eagle Golder	Email 2	carolina-lesseignevurtorres@golder.com
Contact:			

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:	Q69808	Approver ID:	Cost Center:
Job #:		GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		ALS Contact:	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	TOC, TKN	Total + Diss Metals	Nutrients	PSA (wentworth)	pH, hardness	alkalinity, conductivity	DOC (lab filter)	salinity	Routine Parameters	Total + Diss Hg	TDS, TSS	Number of Containers
	MB Ref B1	19-Sep-18	15:30	sediment	X	X	X	X								
	DUP A	13-Sep-18	17:00	"	X	X	X	X								
	MW Ref A3 D	Sept 20	11:00	Marine H2O	X	X	X		X	X	X	X	X	X	X	
	MW Ref A3 S				X	X	X		X	X	X	X	X	X	X	
	MW Ref B1 D		12:00		X	X	X		X	X	X	X	X	X	X	
	MW Ref B1 S		12:00		X	X	X		X	X	X	X	X	X	X	

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	CCME criteria; contact erichard@golder.com
Are samples for human drinking water use? ☐ Yes ☑ No	Report to: agnico_equis@golder.com

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		
					16

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:
Andrew Rappuhn	Sept 20	20:00				JC	SEP 26 2018	9am

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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NA-FM-0326e v08 Front/BA October 2013

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

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Appendix G-2. Sediment Quality QA/QC results

Sample ID			MBE-1 REP 3	DUP A	RPD (%)
Parameter	**Lowest Detection Limit**	**Units**	**Sediments**	**Sediments**	
Leachable Anions & Nutrients (Soil)					
Total Kjeldahl Nitrogen	0.020	%	0.057	0.058	<DL*5
Organic / Inorganic Carbon (Soil)					
Inorganic Carbon	0.050	%	0.097	0.089	<DL*5
Inorganic Carbon (as CaCO3 Equivalent)	0.40	%	0.81	0.74	<DL*5
Total Carbon by Combustion	0.05	%	0.63	0.64	1.6
Total Organic Carbon	0.050	%	0.53	0.551	3.9
Metals (Soil)					
Aluminum (Al)	50	mg/kg	7250	7380	1.8
Antimony (Sb)	0.10	mg/kg	<0.10	<0.10	<DL*5
Arsenic (As)	0.10	mg/kg	4.99	4.70	6.0
Barium (Ba)	0.50	mg/kg	45.8	40.1	13.3
Beryllium (Be)	0.10	mg/kg	0.15	0.15	<DL*5
Bismuth (Bi)	0.20	mg/kg	<0.20	<0.20	<DL*5
Boron (B)	5.0	mg/kg	14.3	14.9	<DL*5
Cadmium (Cd)	0.020	mg/kg	<0.020	<0.020	<DL*5
Calcium (Ca)	50	mg/kg	5490	6140	11.2
Chromium (Cr)	0.50	mg/kg	57.0	36.9	42.8
Cobalt (Co)	0.10	mg/kg	4.40	4.11	6.8
Copper (Cu)	0.50	mg/kg	9.08	7.77	15.5
Iron (Fe)	50	mg/kg	13200	12200	7.9
Lead (Pb)	0.50	mg/kg	3.10	3.51	12.4
Lithium (Li)	2.0	mg/kg	11.6	10.5	10.0
Magnesium (Mg)	20	mg/kg	7010	6500	7.5
Manganese (Mn)	1.0	mg/kg	146	139	4.9
Mercury (Hg)	0.0050	mg/kg	0.0095	0.0109	<DL*5
Molybdenum (Mo)	0.10	mg/kg	2.19	0.63	**110.6**
Nickel (Ni)	0.50	mg/kg	26.3	15.1	**54.1**
Phosphorus (P)	50	mg/kg	815	765	6.3
Potassium (K)	100	mg/kg	2110	1960	7.4
Selenium (Se)	0.20	mg/kg	<0.20	<0.20	<DL*5
Silver (Ag)	0.10	mg/kg	<0.10	<0.10	<DL*5
Sodium (Na)	50	mg/kg	6000	5920	1.3
Strontium (Sr)	0.50	mg/kg	25.4	27.4	7.6
Sulfur (S)	1000	mg/kg	<1000	<1000	<DL*5
Thallium (Tl)	0.050	mg/kg	0.086	0.089	<DL*5
Tin (Sn)	1.0	mg/kg	<1.0	<1.0	<DL*5
Titanium (Ti)	1.0	mg/kg	559	500	11.1
Tungsten (W)	0.50	mg/kg	<0.50	<0.50	<DL*5
Uranium (U)	0.050	mg/kg	0.743	0.838	12.0
Vanadium (V)	0.20	mg/kg	31.1	28.8	7.7
Zinc (Zn)	2.0	mg/kg	24.4	22.9	6.3
Zirconium (Zr)	1.0	mg/kg	4.2	4.6	<DL*5

Notes:
RPD - relative percent difference
<DL*5 - values are less than 5 times detection limit (DL)
Bold values - indicate RPDs greater than 50%

APPENDIX H

Benthic Infauna Laboratory Analysis Data

biologica

Appendix H-1.
Benthic Infauna Data (Biologica)

Total abundance data in matrix format, including total taxa (species richness) for Golder Rankin Inlet 2018.

Biologica Sample ID											18-105-001	18-105-002	18-105-003	18-105-004	18-105-005	18-105-006	18-105-007	18-105-008	18-105-009	18-105-010	18-105-011	18-105-012	18-105-013	18-105-014	18-105-015	18-105-016	18-105-017	18-105-018	18-105-019	18-105-020	18-105-021	18-105-022	18-105-023	18-105-024
Site											MB E-1	MB E-1	MB E-1	MB E-2	MB E-2	MB E-2	MB E-3	MB E-3	MB E-3	MB E-4	MB E-4	MB E-4	MB E-5	MB E-5	MB E-5	MB REF A-1	MB REF A-1	MB REF A-1	MB REF A-2	MB REF A-2	MB REF A-2	MB REF A-3	MB REF A-3	MB REF A-3
Replicate											1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Date Sampled											15-Sep-18	15-Sep-18	15-Sep-18	16-Sep-18	16-Sep-18	16-Sep-18	14-Sep-18	14-Sep-18	14-Sep-18	14-Sep-18	14-Sep-18	14-Sep-18	14-Sep-18	14-Sep-18	14-Sep-18	16-Sep-18	16-Sep-18	16-Sep-18	16-Sep-18	16-Sep-18	16-Sep-18	19-Sep-18	19-Sep-18	19-Sep-18
taxcode	grpcode	Phylum	Class	Order	Family	Subfamily	Taxon Name	Grand Total Unique Taxa	Grand Total Abundance		Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance	Abundance
ANNE	POER	Annelida	Polychaeta	Eunicida	Lumbrineridae		Scoletoma fragilis	1	81		3	3	1	3	7	4	4	2	3	3	1	4	4	8	2	5	1	4	4	5	5	1	1	3
ANNE	POER	Annelida	Polychaeta	Eunicida	Lumbrineridae		Scoletoma sp.		15		2	1	1	2	1					1		1	1									1	2	2
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Nephtyidae		Bipalponephtys cornuta	1	124		9	3	2		3	2	2	4	3	6	2	3	4	14	6	11	3	5	13	2	4	14	6	3
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Pholoidae		Pholoe minuta	1	5				1									1			1						2			
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Eteoninae	Eteone longa complex	1	6						1			1	2						1							1		
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Phyllodocidae	Eteoninae	Eteone sp.		9		1	1	2		1							1				1							1	1
ANNE	POER	Annelida	Polychaeta	Phyllodocida	Polynoidae	Polynoinae	Gattyana cirrhosa	1	1																	1								
ANNE	POSE	Annelida	Polychaeta	Sabellida	Sabellidae	Sabellinae	Euchone incolor	1	2															1					1					
ANNE	POSE	Annelida	Polychaeta	Sabellida	Sabellidae	Sabellinae	Euchone rubrocincta	1	3						1	2																		
ANNE	POSE	Annelida	Polychaeta	Sabellida	Sabellidae		Sabellidae indet.		1																				1					
ANNE	POSE	Annelida	Polychaeta	Spionida	Spionidae		Prionospio (Prionospio) steenstrupi	1	142		5	4	1	7	2	4	3	1	7	5	5	3	5	13	14	9	2	1	5	9	10	10	15	2
ANNE	POSE	Annelida	Polychaeta	Terebellida	Ampharetidae	Ampharetinae	Ampharete acutifrons	1	3									1		1													1	
ANNE	POSE	Annelida	Polychaeta	Terebellida	Ampharetidae	Ampharetinae	Ampharete sp.		3		1			1					1															
ANNE	POSE	Annelida	Polychaeta	Terebellida	Ampharetidae		Ampharetidae indet.		1															1										
ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Chaetozone sp.	1	163		5	9	2	9	8	6	11	7	4	7	6	8	9	11	13	9	3	3	7	9	6	4	5	2
ANNE	POSE	Annelida	Polychaeta	Terebellida	Cirratulidae		Cirratulidae indet.		6					1			1								1	1			1			1		
ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae	Terebellinae	Artacama proboscidea	1	1						1																			
ANNE	POSE	Annelida	Polychaeta	Terebellida	Terebellidae		Lysilla sp.	1	1										1															
ANNE	POSE	Annelida	Polychaeta	Terebellida	Trichobranchidae	Trichobranchinae	Terebellides sp.		3													1		1		1								
ANNE	POSE	Annelida	Polychaeta	Terebellida	Trichobranchidae	Trichobranchinae	Terebellides stroemi	1	14		1	1		1	1	1	2				1		1	1	1						1		1	1	
ANNE	POSE	Annelida	Polychaeta		Capitellidae		Mediomastus sp.	1	2		1				1																			
ANNE	POSE	Annelida	Polychaeta		Cossuridae		Cossura sp.	1	1																		1							
ANNE	POSE	Annelida	Polychaeta		Maldanidae	Euclymeninae	Axiothella sp.	1	1																	1								
ANNE	POSE	Annelida	Polychaeta		Maldanidae	Euclymeninae	Euclymeninae indet.		1																								1	
ANNE	POSE	Annelida	Polychaeta		Opheliidae	Opheliininae	Ophelina acuminata	1	40																	2	6	4	6	13	7	1		1
ANNE	POSE	Annelida	Polychaeta		Opheliidae	Opheliininae	Ophelina breviata	1	1																							1			
ANNE	POSE	Annelida	Polychaeta		Orbiniidae		Leitoscoloplos sp.	1	181		17	8	1	6	9	8	5	6	10	10	3	10	12	11	7	4	6	6	10	9	5	5	5	8
ANNE	POSE	Annelida	Polychaeta		Orbiniidae		Scoloplos armiger	1	51			1		1	1	1		1	1		1	1		3	2	1	4		5	2	6	5	8	7
ANNE	POSE	Annelida	Polychaeta		Orbiniidae		Scoloplos sp.		3			1									1				1									
ANNE	POSE	Annelida	Polychaeta		Scalibregmatidae		Scalibregma inflatum	1	23		2	2	1	3		4		1	1		1	1				2			1		2	1	1
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae		Ampelisca sp.	1	3						1					1				1										
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Ampeliscidae		Ampeliscidae indet.		1												1														
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Dulichiidae		Dulichia sp.	1	1					1																					
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Isaeidae		Protomedeia sp.	1	338			1		17	10	4	12	11	16	26	20	17	14	45	47	4	1		11	16	9	8	46	3
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Lysianassidae		Hippomedon propinqus	1	2						2																			
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Lysianassidae		Hippomedon serratus	1	7													7												
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Lysianassidae		Hippomedon sp.		5						1						1			1										2
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Lysianassidae		Lysianassidae indet.		1																									1
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Lysianassidae		Orchomenella sp.	1	1							1																		
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Melitidae		Megamoera dentata	1	3		1	1																						1
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Melitidae		Melita dentata	1	1																1									
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae		Aceroides sp.	1	1																								1	
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae		Bathymedon obtusifrons	1	10								1					1	2	3	3									
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae		Monoculodes intermedius	1	1														1											
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae		Monoculodes sp.		12			1					1			1			1				1	2	3		1		1	
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Oedicerotidae		Oedicerotidae indet.		1																								1	
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda	Pontoporeiidae		Pontoporeia femorata	1	11						1					1			1	1						1	2	1		3
ARTH	CRAM	Arthropoda	Malacostraca	Amphipoda			Amphipoda indet.		12		2	1		1		2							4						1				1	
ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Diastylidae		Diastylis glabra	1	2																1						1			
ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Diastylidae		Diastylis sp.		2							2																		
ARTH	CRCU	Arthropoda	Malacostraca	Cumacea	Leuconidae		Leucon sp.	1	15		1					1	1		1	1		1	3								4		2
ARTH	CRLE	Arthropoda	Malacostraca	Nebaliacea	Nebaliidae		Nebalia sp.	1	1														1											
ECHI	ECOP	Echinodermata	Ophiuroidea	Ophiurida	Ophiuridae		Ophiuridae indet.	1	1																								1	
MISC	BRYO	Bryozoa	Gymnolaemata	Cheilostomatida	Candidae		Scrupocellaria sp.	1	1																				1					
MISC	BRYO	Bryozoa	Gymnolaemata	Cheilostomatida	Hippothoidae		Celleporella hyalina	1	1															1										
MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida	Crisiidae		Crisia aculeata	1	1																									1
MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida	Lichenoporidae		Lichenopora sp.	1	11																				11					
MISC	BRYO	Bryozoa	Stenolaemata	Cyclostomatida	Tubuliporidae		Tubulipora sp.	1	1																				1					
MISC	NTEA	Nemertea	Anopla	Heteronemertea	Lineidae		Cerebratulus sp.	1	1															1										
MISC	NTEA	Nemertea	Enopla	Hoplonemertea			Hoplonemertea indet.	1	14		1		1		1		1	1							1	1			2			2	3	
MOLL	MOBI	Mollusca	Bivalvia	Adapedonta	Hiatellidae		Hiatella arctica	1	3			1													1				1					
MOLL	MOBI	Mollusca	Bivalvia	Anomalodesmata	Thraciidae		Thracia sp.	1	1									1																
MOLL	MOBI	Mollusca	Bivalvia	Lucinida	Thyasiridae		Thyasira sp.	1	8					1		1			1	1	1		1	1									1	
MOLL	MOBI	Mollusca	Bivalvia	Lucinida	Thyasiridae		Thyasiridae indet.		6			2		1											2			1						
MOLL	MOBI	Mollusca	Bivalvia	Myida	Myidae		Mya truncata	1	4				1							1				1									1	
MOLL	MOBI	Mollusca	Bivalvia	Nuculida	Nuculidae		Ennucula tenuis	1	17		5	1	1	2		4		1	1				2										
MOLL	MOBI	Mollusca	Bivalvia	Veneroida	Cardiidae	Clinocardiinae	Ciliatocardium ciliatum	1	1								1																	
MOLL	MOBI	Mollusca	Bivalvia	Veneroida	Cardiidae	Clinocardiinae	Clinocardiinae indet.		1																								1	
MOLL	MOBI	Mollusca	Bivalvia	Veneroida	Tellinidae	Macominae	Macoma calcarea	1	1						1																			
MOLL	MOGA	Mollusca	Gastropoda	Littorinimorpha	Littorinidae		Littorinidae indet.	1	8												1	1	1				5							
							Total Abundance		**1,400**		**57**	**42**	**15**	**59**	**54**	**45**	**46**	**38**	**52**	**66**	**46**	**60**	**67**	**120**	**105**	**51**	**32**	**26**	**85**	**67**	**57**	**63**	**104**	**43**
							Total Unique Taxa (species richness):	**52**			**14**	**15**	**11**	**14**	**16**	**14**	**13**	**13**	**13**	**14**	**14**	**14**	**18**	**15**	**16**	**13**	**10**	**8**	**16**	**10**	**11**	**16**	**19**	**15**
							Incidental Organisms																												
MEMO	MEMO						Amphipoda indet. (fragment)		1				1																						
MEMO	MEMO						Annelida indet. (fragment)		1							1																			
MEMO	MEMO						Bivalvia indet. (fragment)		1																										1
MEMO	MEMO						Brachyura indet. (zoea)		7					1	1										1						1	1		2
MEMO	MEMO						Nematoda indet.		3			1				1	1																	

Appendix H-1.
Benthic Infauna Data (Biologica)

Abbreviations & Definitions

Worksheets:
1. Abbrevi Glossary of terms and outline of report.
2. Data - M Total abundance data in matrix format, including total taxa count per sample and total abundance per sample.
3. Data - L Raw abundance data in long format.
4. QC-QA I Results of sorting efficiency.

Life Stages:

A	Adult
Int	Intermediate - has adult features but not of typical reproductive size
J	Juvenile
L	Larvae
N	Nymph
P	Pupa
Col	Colony
Deut	Deutonymph
MEMO	Incidental taxa/fragments not included in data, or whose abundance is not generally captured accurately by 1.0mm screen.
Total Num	Number of unique taxa (=species richness), not including higher-order taxa for which there exists a lower-order identification (e.g. not including *Lumbrineris* sp. if there exists *Lumbrineris cruzensis* in the data)
Total Num	Total Abundance, not including incidental taxa

Biologica Coding

Major Taxonomic Groups:

Miscellaneous

BRAC	Brachiopoda
BRYO	Bryozoa
CNAN	Cnidaria Anthozoa
CNHY	Cnidaria Hydrozoa
CNXX	Cnidaria
ENTO	Entoprocta
EURA	Echiura
HEMI	Hemichordata
KINO	Kinorhyncha
NTEA	Nemertea
PHOR	Phoronida
PIXX	Pisces
PLTY	Platyhelminthes
PORI	Porifera
PRIA	Priapulida
SIPN	Sipuncula
TARD	Tardigrada
URAS	Ascidiacea

Annelida

ANHI	Annelida Hirudinea
ANOL	Annelida Oligochaeta
POER	Polychaeta Errantia
POSE	Polychaeta Sedentaria
POLY	Polychaeta
POXX	Polychaeta indet.

Arthropoda

CHPY	Chelicerata Pycnogonida
CHAC	Chelicerata Arachnida
CRAM	Crustacea Amphipoda
CRCI	Crustacea Cirripedia
CRCO	Crustacea Copepoda
CRCU	Crustacea Cumacea
CRDE	Crustacea Decapoda
CRIS	Crustacea Isopoda
CRLE	Crustacea Leptostraca
CRMY	Crustacea Mysidacea
CROS	Crustacea Ostracoda
CRTA	Crustacea Tanaidacea
CRXX	Crustacea

Echinodermata

ECAS	Echinodermata Asteroidea
ECCR	Echinodermata Crinoidea
ECEC	Echinodermata Echinoidea
ECHO	Echinodermata Holothuroidea
ECOP	Echinodermata Ophiuroidea

Mollusca

MOAP	Mollusca Aplacophora
MOBI	Mollusca Bivalvia
MOCE	Mollusca Cephalopoda
MOGA	Mollusca Gastropoda
MOPO	Mollusca Polyplacophora
MOSC	Mollusca Scaphopoda

Taxonomic Family Codes:

Group	Family	Family code	Group	Family	Family code
ANHI	Piscicolidae	1138	KINO	Echinoderidae	1148
ANOL	Enchytraeidae	1133	KINO	Neocentrophyidae	1150
ANOL	Naididae	1134	KINO	Pycnophyidae	1152
ANOL	Tubificidae	1136	KINO	Semnoderidae	1154
BRAC	Frieleiidae	0951	MOAP	Chaetodermatidae	0338
BRAC	Cancellothyrididae	0952	MOAP	Limifossoridae	0340
BRAC	Craniidae	0953	MOBI	Anomiidae	0348
BRAC	Laqueidae	0954	MOBI	Aricidae	0350
BRAC	Platidiidae	0955	MOBI	Astartidae	0352
BRAC	Lingulidae	0956	MOBI	Cardiidae	0354
BRAC	Dallinidae	0957	MOBI	Carditidae	0356
BRAC	Terebrataliidae	0958	MOBI	Chamidae	0358
BRYO	Aeteidae	0961	MOBI	Corbiculidae	0360
BRYO	Alcyonidiidae	0962	MOBI	Corbulidae	0362
BRYO	Annectocymidae	0964	MOBI	Crassatellidae	0364
BRYO	Arachnidiidae	0966	MOBI	Cuspidariidae	0366
BRYO	Bugulidae	0968	MOBI	Dimyidae	0368
BRYO	Bitectiporidae	0969	MOBI	Donacidae	0370
BRYO	Calloporidae	0970	MOBI	Galeommatidae	0372
BRYO	Candidae	0972	MOBI	Gastrochaenidae	0374
BRYO	Cellariidae	0974	MOBI	Glycymerididae	0376
BRYO	Celleporidae	0976	MOBI	Hiatellidae	0378
BRYO	Chapperiidae	0980	MOBI	Isognomonidae	0380
BRYO	Cheiloporinidae	0981	MOBI	Kelliellidae	0382
BRYO	Clavoporidae	0982	MOBI	Lasaeidae	0384
BRYO	Cribrilinidae	0983	MOBI	Laternulidae	0386
BRYO	Crisiidae	0984	MOBI	Limidae	0388
BRYO	Diastoporidae	0985	MOBI	Limopsidae	0390
BRYO	Epistomiidae	0986	MOBI	Lucinidae	0392
BRYO	Escharellidae	0987	MOBI	Lyonsiidae	0394
BRYO	Entalophoridae	0988	MOBI	Mactridae	0396
BRYO	Diaperoeciidae	0989	MOBI	Malletiidae	0398
BRYO	Electridae	0990	MOBI	Manzanellidae	0400
BRYO	Eucrateidae	0993	MOBI	Modiolatus	0401
BRYO	Hincksinidae	0988	MOBI	Myidae	0402
BRYO	Hippoporinidae	0989	MOBI	Mytilidae	0404
BRYO	Hippothoidae	0990	MOBI	Neilonellidae	0406
BRYO	Lichenoporidae	0991	MOBI	Neoleptonidae	0408
BRYO	Lunulariidae	0992	MOBI	Noetilldae	0410
BRYO	Membraniporidae	0994	MOBI	Nuculanidae	0412
BRYO	Microporellidae	0996	MOBI	Nuculidae	0414
BRYO	Microporidae	0998	MOBI	Ostreidae	0416
BRYO	Mucronellidae	0999	MOBI	Pandoridae	0418
BRYO	Myriaporidae	1000	MOBI	Pectinidae	0420
BRYO	Oncousoeciidae	1001	MOBI	Periplomatidae	0422
BRYO	Phylactellidae	1002	MOBI	Petricolidae	0424
BRYO	Reteporidae	1001	MOBI	Pharidae	0426
BRYO	Rhamphostomellidae	1004	MOBI	Philobryidae	0428
BRYO	Schizoporellidae	1006	MOBI	Pholadidae	0430
BRYO	Smittinidae	1008	MOBI	Pinnidae	0432
BRYO	Stomachetosellidae	1009	MOBI	Poromyidae	0434
BRYO	Thalamoporellidae	1010	MOBI	Pristiglomidae	0436
BRYO	Triticellidae	1012	MOBI	Propeamussiidae	0438
BRYO	Tubuliporidae	1014	MOBI	Psammobiidae	0440
BRYO	Umbonulidae	1015	MOBI	Pteriidae	0442
BRYO	Vesiculariidae	1016	MOBI	Saccella	0443
BRYO	Victorellidae	1017	MOBI	Semelidae	0444
CHAC	Halacaridae	0673	MOBI	Siliculidae	0446
CHPY	Ammotheidae	0662	MOBI	Solecurtidae	0448
CHPY	Callipallenidae	0664	MOBI	Solemyidae	0450
CHPY	Nymphonidae	0666	MOBI	Solenidae	0452
CHPY	Phoxichilidiidae	0668	MOBI	Spheniopsidae	0454
CHPY	Pycnogonidae	0670	MOBI	Tellinidae	0456
CHPY	Tanystylidae	0672	MOBI	Teredinidae	0458
CNAN	Actiniidae	0040	MOBI	Thraciidae	0460
CNAN	Actinostolidae	0041	MOBI	Thyasiridae	0462
CNAN	Anthothelidae	0043	MOBI	Tindariidae	0464
CNAN	Caryophylliidae	0042	MOBI	Trapezidae	0466
CNAN	Cerianthidae	0044	MOBI	Turtoniidae	0468
CNAN	Clavulariidae	0046	MOBI	Ungulinidae	0470
CNAN	Corallimorphidae	0048	MOBI	Veneridae	0472
CNAN	Dendrophylliidae	0049	MOBI	Verticordiidae	0474
CNAN	Diadumenidae	0050	MOBI	Vesicomyidae	0476
CNAN	Edwardsiidae	0052	MOBI	Yoldiidae	0478
CNAN	Epizoanthidae	0054	MOCE	Histioteuthidae	0652
CNAN	Gorgoniidae	0056	MOCE	Loliginiidae	0654
CNAN	Halcampidae	0058	MOCE	Octopodidae	0656
CNAN	Halcampoididae	0060	MOCE	Opisthoteuthidae	0658
CNAN	Haloclavidae	0062	MOCE	Sepiolidae	0660
CNAN	Hormanthiidae	0064	MOGA	Acmaeidae	0480
CNAN	Isanthidae	0066	MOGA	Acteonidae	0482
CNAN	Limnactiniidae	0068	MOGA	Adeorbidae	0484
CNAN	Metridiidae	0070	MOGA	Aeolidiidae	0486
CNAN	Muriceidae	0072	MOGA	Aglajidae	0488

Appendix H-1.
Benthic Infauna Data (Biologica)

Taxonomic Family Codes:

Group	Family	Family code	Group	Family	Family code
CNAN	Pennatulidae	0074	MOGA	Aplysiidae	0490
CNAN	Plexauridae	0076	MOGA	Archidorididae	0492
CNAN	Protoptilidae	0077	MOGA	Arminidae	0494
CNAN	Renillidae	0078	MOGA	Barleeidae	0496
CNAN	Sagartiidae	0080	MOGA	Buccinidae	0498
CNAN	Virgulariidae	0082	MOGA	Bullidae	0500
CNHY	Aequoreidae	0083	MOGA	Bursidae	0502
CNHY	Aglaopheniidae	0084	MOGA	Cadlinidae	0504
CNHY	Cladonematidae	0085	MOGA	Caecidae	0506
CNHY	Alcycellidae	0086	MOGA	Calliostomatidae	0507
CNHY	Bonneviellidae	0087	MOGA	Calyptraeidae	0508
CNHY	Bougainvilliidae	0088	MOGA	Cancellariidae	0510
CNHY	Calycopsidae	0089	MOGA	Cerithiidae	0512
CNHY	Campanulariidae	0090	MOGA	Cerithiopsidae	0514
CNHY	Eirenidae	0091	MOGA	Colloniidae	0515
CNHY	Campanulinidae	0092	MOGA	Columbellidae	0516
CNHY	Clavidae	0093	MOGA	Mangeliidae	0518
CNHY	Corymorphidae	0094	MOGA	Conidae	0519
CNHY	Corynidae	0095	MOGA	Conualeviidae	0520
CNHY	Eudendriidae	0096	MOGA	Coralliophilidae	0522
CNHY	Haleciidae	0097	MOGA	Corambidae	0524
CNHY	Hebellidae	0098	MOGA	Cumanotidae	0526
CNHY	Halimedusidae	0099	MOGA	Cylichnidae	0528
CNHY	Hydractiniidae	0100	MOGA	Cymatiidae	0529
CNHY	Laodiceidae		MOGA	Dendrodorididae	0530
CNHY	Lafoeidae	0101	MOGA	Dendronotidae	0532
CNHY	Lovenellidae	0102	MOGA	Diaphanidae	0534
CNHY	Mitrocomidae	0103	MOGA	Dironidae	0536
CNHY	Olindiasidae	0104	MOGA	Discodorididae	0538
CNHY	Pandeidae	0105	MOGA	Doridiidae	0539
CNHY	Pennariidae	0106	MOGA	Dotoidae	0540
CNHY	Euphysidae	0107	MOGA	Epitoniidae	0542
CNHY	Plumulariidae	0108	MOGA	Eulimidae	0544
CNHY	Proboscidactylidae	0109	MOGA	Facelinidae	0546
CNHY	Protohydridae		MOGA	Fasciolariidae	0548
CNHY	Rathkeidae		MOGA	Fissurellidae	0550
CNHY	Rhodaliidae	0110	MOGA	Flabellinidae	0552
CNHY	Rhysiidae	0111	MOGA	Gastropteridae	0554
CNHY	Sertulariidae	0112	MOGA	Goniodorididae	0556
CNHY	Tiarannidae	0113	MOGA	Haminoeidae	0558
CNHY	Trichydridae		MOGA	Hermaeidae	0560
CNHY	Tubulariidae	0114	MOGA	Hipponicidae	0562
CNHY	Velellidae	0115	MOGA	Aplustridae	0564
CNHY	Cordylophoridae	0116	MOGA	Littorinidae	0566
CNHY	Calycellidae	0117	MOGA	Lamellariidae	0568
CRAM	Iphimediidae	0760	MOGA	Lepetidae	0570
CRAM	Ampeliscidae	0762	MOGA	Litiopidae	0572
CRAM	Amphilochidae	0764	MOGA	Lottiidae	0574
CRAM	Ampithoidae	0766	MOGA	Cysticidae	0576
CRAM	Anisogammaridae	0767	MOGA	Mitridae	0578
CRAM	Anamixidae	0768	MOGA	Muricidae	0580
CRAM	Aoridae	0770	MOGA	Nassariidae	0582
CRAM	Argissidae	0772	MOGA	Naticidae	0584
CRAM	Astyridae	0774	MOGA	Notodorididae	0586
CRAM	Bateidae	0776	MOGA	Nucellidae	0587
CRAM	Beaudettiidae	0778	MOGA	Oleidae	0588
CRAM	Calliopiidae	0780	MOGA	Olividae	0590
CRAM	Caprellidae	0782	MOGA	Onchidorididae	0592
CRAM	Cheluridae	0784	MOGA	Ovulidae	0594
CRAM	Colomastigidae	0786	MOGA	Philinidae	0596
CRAM	Corophiidae	0788	MOGA	Platydorididae	0598
CRAM	Cressidae	0790	MOGA	Pleurobranchidae	0600
CRAM	Dexaminidae	0792	MOGA	Polyceratidae	0602
CRAM	Dogielinotidae	0794	MOGA	Potamididae	0603
CRAM	Eophliantidae	0796	MOGA	Pseudomelatomidae	0604
CRAM	Eusiridae	0798	MOGA	Pyramidellidae	0606
CRAM	Gammaridae	0800	MOGA	Retusidae	0608
CRAM	Haustoriidae	0802	MOGA	Rissoidae	0610
CRAM	Hyalidae	0804	MOGA	Scaphandridae	0612
CRAM	Hyatellidae	0806	MOGA	Sciddurellidae	0614
CRAM	Hyperiopsidae	0808	MOGA	Stiligeridae	0615
CRAM	Isaeidae	0810	MOGA	Terebridae	0616
CRAM	Ischyroceridae	0812	MOGA	Tergipedidae	0618
CRAM	Kuriidae	0814	MOGA	Tethyidae	0620
CRAM	Lafystiidae	0816	MOGA	Trichotropididae	0621
CRAM	Laphystiopsidae	0818	MOGA	Tritoniidae	0622
CRAM	Lepechinellidae	0820	MOGA	Triviidae	0624
CRAM	Leucothoidae	0822	MOGA	Trochidae	0626
CRAM	Liljeborgiidae	0824	MOGA	Truncatellidae	0628
CRAM	Lysianassidae	0826	MOGA	Turbinidae	0630
CRAM	Megaluropidae	0827	MOGA	Turbinellidae	0632
CRAM	Melphidippidae	0828	MOGA	Turridae	0634
CRAM	Melitidae	0829	MOGA	Turritellidae	0636
CRAM	Ochlesidae	0830	MOGA	Vanikoridae	0638

Taxonomic Family Codes:

Group	Family	Family code	Group	Family	Family code
CRAM	Maeridae	0831	MOGA	Velutinidae	0471
CRAM	Oedicerotidae	0832	MOGA	Vermetidae	0640
CRAM	Opisidae	0833	MOGA	Vitrinellidae	0642
CRAM	Pagetinidae	0834	MOPO	Callistoplacidae	0341
CRAM	Odiidae	0835	MOPO	Ischnochitonidae	0342
CRAM	Parampithoidae	0836	MOPO	Protochitonidae	0343
CRAM	Pardaliscidae	0838	MOPO	Leptochitonidae	0344
CRAM	Pariambidae	0840	MOPO	Tonicellidae	0345
CRAM	Philiantidae	0842	MOPO	Mopaliidae	0346
CRAM	Phoxocephalidae	0844	MOPO	Schizoplacidae	0347
CRAM	Phtiscidae	0846	MOPO	Lepidochitonidae	0348
CRAM	Pleustidae	0848	MOSC	Dentaliidae	0644
CRAM	Podoceridae	0850	MOSC	Gadilidae	0646
CRAM	Pontogeneiidae	0851	MOSC	Pulsellidae	0647
CRAM	Prophliantidae	0852	MOSC	Rhabdidae	0648
CRAM	Pontoporeiidae	0853	MOSC	Siphonodentaliidae	0650
CRAM	Protellidae	0854	NTEA	Amphiporidae	0140
CRAM	Sebidae	0856	NTEA	Carinomidae	0142
CRAM	Stegocephalidae	0858	NTEA	Cephalothricidae	0144
CRAM	Stenothoidae	0859	NTEA	Emplectonematidae	0146
CRAM	Stilipedidae	0860	NTEA	Lineidae	0148
CRAM	Synopiidae	0862	NTEA	Cratenemertidae	0149
CRAM	Talitridae	0864	NTEA	Ototyphlonemertidae	0150
CRAM	Thaumatelsonidae	0866	NTEA	Prosorhochmidae	0152
CRAM	Urothoidae	0865	NTEA	Tetrastemmatidae	0154
CRAM	Vitjazianidae	0868	NTEA	Tubulanidae	0156
CRCO	Clytemnestridae	1300	NTEA	Valenciniidae	0158
CRCO	Harpacticidae	1301	PHOR	Phoronidae	0950
CRCO	Mytilicolidae	1302	PIXX	Anarhichadidae	1190
CRCO	Chondracanthidae	1303	PIXX	Ammodytidae	1195
CRCO	Caligidae	1304	PIXX	Cryptacanthodidae	1200
CRCO	Tisbidae	1305	PIXX	Stichaeidae	1210
CRCO	Ectinosomatidae	1306	PIXX	Bathylagidae	1220
CRCI	Archaeobalanidae	0688	PIXX	Batrachoididae	1230
CRCI	Balanidae	0690	PIXX	Gobiidae	1240
CRCI	Chthamalidae	0691	PIXX	Liparidae	1250
CRCI	Pollicipedidae	0693	PIXX	Agonidae	1255
CRCI	Scalpellidae	0692	PIXX	Zoarcidae	1260
CRCU	Bodotriidae	0698	PIXX	Scorpaenidae	1270
CRCU	Diastylidae	0700	PIXX	Pholidae	1271
CRCU	Lampropidae	0702	PLTY	Callioplanidae	0116
CRCU	Leuconidae	0704	PLTY	Cryptocelididae	0118
CRCU	Nannastacidae	0706	PLTY	Emprosthopharyngidae	0120
CRDE	Albuneidae	0870	PLTY	Eurylepidae	0122
CRDE	Alpheidae	0872	PLTY	Holoplanidae	0124
CRDE	Aristeidae	0874	PLTY	Latocestidae	0126
CRDE	Atelecyclidae	0875	PLTY	Leptoplanidae	0128
CRDE	Axiidae	0876	PLTY	Planoceridae	0130
CRDE	Calappidae	0878	PLTY	Pleioplanidae	0131
CRDE	Callianassidae	0880	PLTY	Plehniidae	0132
CRDE	Cancridae	0882	PLTY	Promesostomidae	0133
CRDE	Crangonidae	0884	PLTY	Prostiostomidae	0134
CRDE	Cyclodorippidae	0886	PLTY	Pseudocerotidae	0136
CRDE	Diogenidae	0888	PLTY	Stylochidae	0138
CRDE	Dromiidae	0890	POER	Aceotidae	0160
CRDE	Galatheidae	0892	POER	Alciopidae	0162
CRDE	Grapsidae	0894	POER	Amphinomidae	0164
CRDE	Hippidae	0896	POER	Aphroditidae	0166
CRDE	Hippolytidae	0898	POER	Chrysopetalidae	0168
CRDE	Homolidae	0900	POER	Diurodrilidae	0170
CRDE	Laomediidae	0902	POER	Dorvilleidae	0172
CRDE	Leucosiidae	0904	POER	Eulepethidae	0174
CRDE	Lithodidae	0906	POER	Eunicidae	0176
CRDE	Majidae	0908	POER	Euphrosinidae	0178
CRDE	Ogyrididae	0910	POER	Glyceridae	0180
CRDE	Oplophoridae	0912	POER	Goniadidae	0182
CRDE	Oregoniidae	0913	POER	Hartmaniellidae	0184
CRDE	Paguridae	0914	POER	Hesionidae	0186
CRDE	Palaemonidae	0916	POER	Histriobdellidae	0188
CRDE	Palicidae	0918	POER	Icthyotomidae	0190
CRDE	Palinuridae	0920	POER	Iospilidae	0192
CRDE	Pandalidae	0922	POER	Lacydoniidae	0194
CRDE	Parapaguridae	0924	POER	Lopadorhynchidae	0196
CRDE	Parthenopidae	0926	POER	Lumbrineridae	0198
CRDE	Pasiphaeidae	0928	POER	Nautiliniellidae	0200
CRDE	Penaeidae	0930	POER	Nephtyidae	0202
CRDE	Pinnotheridae	0932	POER	Nereididae	0204
CRDE	Porcellanidae	0934	POER	Oenonidae	0206
CRDE	Portunidae	0936	POER	Onuphidae	0208
CRDE	Processidae	0938	POER	Paralacydoniidae	0210
CRDE	Sergestidae	0940	POER	Pholoidae	0212
CRDE	Sicyoniidae	0942	POER	Phyllodocidae	0214
CRDE	Solenoceridae	0944	POER	Pilargidae	0216
CRDE	Upogebiidae	0946	POER	Pisionidae	0218

Taxonomic Family Codes:

Group	Family	Family code	Group	Family	Family code
CRDE	Xanthidae	0948	POER	Polynoidae	0220
CRIS	Aegidae	0720	POER	Pontodoridae	0222
CRIS	Ancinidae	0722	POER	Sigalionidae	0224
CRIS	Anthuridae	0724	POER	Sphaerodoridae	0226
CRIS	Arcturidae	0726	POER	Syllidae	0228
CRIS	Bopyridae	0728	POER	Tomopteridae	0230
CRIS	Cirolanidae	0730	POER	Typhloscolecidae	0232
CRIS	Corallanidae	0732	PORI	Amphoriscidae	0002
CRIS	Cymothoidae	0734	PORI	Aphrocallistidae	0004
CRIS	Desmosomatidae	0735	PORI	Aplysillidae	0005
CRIS	Gnathiidae	0736	PORI	Axinellidae	0006
CRIS	Idoteidae	0738	PORI	Coelosphaeridae	0007
CRIS	Janiridae	0740	PORI	Clathriidae	0008
CRIS	Joeropsididae	0742	PORI	Desmacellidae	0009
CRIS	Limnoriidae	0744	PORI	Clathrinidae	0010
CRIS	Munnidae	0746	PORI	"Clionidae"	0011
CRIS	Munnopsidae	0748	PORI	Cyamonidae	0012
CRIS	Paramunnidae	0750	PORI	Dysideidae	0013
CRIS	Paranthuridae	0752	PORI	Grantiidae	0014
CRIS	Scyphacidae	0753	PORI	Halichondriidae	0015
CRIS	Serolidae	0754	PORI	Haliclonidae	0016
CRIS	Sphaeromatidae	0756	PORI	Halisarcidae	0019
CRIS	Tridentellidae	0758	PORI	Hymedesmiidae	0021
CRLE	Nebaliidae	0694	PORI	Hymeniacidonidae	0017
CRMY	Mysidae	0696	PORI	Leucosoleniidae	0018
CROS	Cylindroleberididae	0674	PORI	Microcionidae	0019
CROS	Cyprididae	0676	PORI	Mycalidae	0020
CROS	Cypridinidae	0678	PORI	Myxillidae	0022
CROS	Cytheridae	0677	PORI	Pachastrellidae	0024
CROS	Cytheruridae	0675	PORI	Plakinidae	0023
CROS	Loxoconchidae	0679	PORI	Polymastiidae	0025
CROS	Macrocyprididae	0680	PORI	Raspailiidae	0026
CROS	Paradoxostomatidae	0681	PORI	Rossellidae	0028
CROS	Philomedidae	0682	PORI	Spirastrellidae	0030
CROS	Pontocyprididae	0683	PORI	Stellettidae	0032
CROS	Rutidermatidae	0684	PORI	Suberitidae	0034
CROS	Sarsiellidae	0686	PORI	Sycettidae	0035
CROS	Trachyleberididae	0687	PORI	Tethyidae	0036
CRTA	Anarthruridae	0708	PORI	Tedaniidae	0037
CRTA	Akanthophoreidae	0709	PORI	Tetillidae	0038
CRTA	Leptocheliidae	0710	POSE	Aberrantidae	0234
CRTA	Leptognathiidae	0711	POSE	Acrocirridae	0236
CRTA	Nototanaidae	0713	POSE	Aeolosomatidae	0238
CRTA	Paratanaidae	0712	POSE	Alvinellidae	0240
CRTA	Pseudotanaidae	0714	POSE	Ampharetidae	0242
CRTA	Tanaellidae	0715	POSE	Apistobranchidae	0244
CRTA	Tanaidae	0716	POSE	Arenicolidae	0246
CRTA	Typhlotanaidae	0718	POSE	Capitellidae	0248
ECAS	Asteriidae	1020	POSE	Chaetopteridae	0250
ECAS	Asterinidae	1022	POSE	Cirratulidae	0252
ECAS	Asteropseidae	1024	POSE	Cossuridae	0254
ECAS	Astropectinidae	1026	POSE	Ctenodrilidae	0256
ECAS	Benthopectinidae	1028	POSE	Fabriciidae	0257
ECAS	Brisingidae	1030	POSE	Fauveliopsidae	0258
ECAS	Ctenodiscidae	1032	POSE	Flabelligeridae	0260
ECAS	Echinasteridae	1034	POSE	Longosomatidae	0262
ECAS	Freyellidae	1036	POSE	Magelonidae	0264
ECAS	Goniasteridae	1038	POSE	Maldanidae	0266
ECAS	Korethrasteridae	1040	POSE	Nerillidae	0268
ECAS	Labidiasteridae	1042	POSE	Opheliidae	0270
ECAS	Luididae	1044	POSE	Orbiniidae	0272
ECAS	Pedicellasteridae	1046	POSE	Oweniidae	0274
ECAS	Poraniidae	1048	POSE	Paraonidae	0276
ECAS	Porcellanasteridae	1050	POSE	Parergodrilidae	0278
ECAS	Pterasteridae	1052	POSE	Pectinariidae	0280
ECAS	Solasteridae	1054	POSE	Poecilochaetidae	0282
ECAS	Zoroasteridae	1056	POSE	Poeobiidae	0284
ECCR	Antedonidae	1018	POSE	Polygordiidae	0286
ECEC	Brissidae	1076	POSE	Potamodrilidae	0288
ECEC	Dendrasteridae	1078	POSE	Protodrilidae	0290
ECEC	Loveniidae	1080	POSE	Protodriloididae	0292
ECEC	Schizasteridae	1082	POSE	Psammodrilidae	0294
ECEC	Spatangidae	1084	POSE	Questidae	0296
ECEC	Strongylocentrotidae	1086	POSE	Sabellariidae	0298
ECEC	Toxopneustidae	1088	POSE	Sabellidae	0300
ECHO	Caudinidae	1090	POSE	Saccocirridae	0302
ECHO	Chirodotidae	1092	POSE	Scalibregmatidae	0304
ECHO	Cucumariidae	1094	POSE	Serpulidae	0306
ECHO	Molpadiidae	1096	POSE	Spintheridae	0308
ECHO	Phyllophoridae	1098	POSE	Spionidae	0310
ECHO	Psolidae	1100	POSE	Spirorbidae	0311
ECHO	Sclerodactylidae	1102	POSE	Sternaspidae	0312
ECHO	Stichopodidae	1104	POSE	Terebellidae	0314
ECHO	Synallactidae	1106	POSE	Trichobranchidae	0316

Taxonomic Family Codes:

Group	Family	Family code	Group	Family	Family code
ECHO	Synaptidae	1108	POSE	Trochochaetidae	0318
ECOP	Amphiuridae	1058	POSE	Uncispionidae	0320
ECOP	Gorgonocephalidae	1060	PRIA	Maccabeidae	1156
ECOP	Ophiacanthidae	1062	PRIA	Priapulidae	1158
ECOP	Ophiactidae	1064	PRIA	Tubiluchidae	1160
ECOP	Ophiocomidae	1066	SIPN	Aspidosiphonidae	0328
ECOP	Ophiodermatidae	1068	SIPN	Golfingiidae	0330
ECOP	Ophionereidae	1070	SIPN	Phascolionidae	0332
ECOP	Ophiotricidae	1072	SIPN	Themistidae	0333
ECOP	Ophiuridae	1074	SIPN	Phascolosomatidae	0334
ENTO	Barentsiidae	0958	SIPN	Sipunculidae	0336
ENTO	Pedicellinidae	0959	TARD	Echiniscoididae	0661
ENTO	Loxosomatidae	0960	URAS	Agneziidae	1110
EURA	Bonelliidae	0322	URAS	Cionidae	1112
EURA	Echiuridae	0323	URAS	Clavelinidae	1113
EURA	Thalassematidae	0324	URAS	Corellidae	1114
EURA	Urechidae	0326	URAS	Didemnidae	1115
HEMI	Harrimaniidae	1126	URAS	Molgulidae	1116
HEMI	Ptychoderidae	1128	URAS	Polycitoridae	1118
HEMI	Spengeliidae	1130	URAS	Polyclinidae	1120
KINO	Campiloderidae	1140	URAS	Pyuridae	1122
KINO	Cateriidae	1142	URAS	Ritterellidae	1123
KINO	Centroderidae	1144	URAS	Styelidae	1124
KINO	Condyloderidae	1146	URAS	Ascidiidae	1132

Marine Benthic Enumeration and Identification Methods
Client: Golder
Project: Rankin Inlet 2018

Sample Inventory

Sample arrival: September 26, 2018
Number of samples: 24
Number of jars: 24
Screen size (lab): 500 µm
Biologica project number: 18-105

The chain of custody documents were checked and approved with the client. Samples were transferred from formalin into 70% ethanol, and stained with Rose Bengal to aid in sorting. Each sample was provided a unique identification number and placed in the queue for analysis.

Table 1. Summary of benthic samples processed for Golder Rankin Inlet 2018.

Client Sample ID	Replicate	Date Sampled	Biologica Sample ID	Split	Organisms Counted
MB E-1	1	15-Sep-18	18-105-001	Whole	57
MB E-1	2	15-Sep-18	18-105-002	Whole	42
MB E-1	3	15-Sep-18	18-105-003	Whole	15
MB E-2	1	16-Sep-18	18-105-004	Whole	59
MB E-2	2	16-Sep-18	18-105-005	Whole	54
MB E-2	3	16-Sep-18	18-105-006	Whole	45
MB E-3	1	14-Sep-18	18-105-007	Whole	46
MB E-3	2	14-Sep-18	18-105-008	Whole	38
MB E-3	3	14-Sep-18	18-105-009	Whole	52
MB E-4	1	14-Sep-18	18-105-010	Whole	66
MB E-4	2	14-Sep-18	18-105-011	Whole	46
MB E-4	3	14-Sep-18	18-105-012	Whole	60
MB E-5	1	14-Sep-18	18-105-013	Whole	67
MB E-5	2	14-Sep-18	18-105-014	Whole	120
MB E-5	3	14-Sep-18	18-105-015	Whole	105
MB REF A-1	1	16-Sep-18	18-105-016	Whole	51
MB REF A-1	2	16-Sep-18	18-105-017	Whole	32
MB REF A-1	3	16-Sep-18	18-105-018	Whole	26
MB REF A-2	1	16-Sep-18	18-105-019	Whole	85
MB REF A-2	2	16-Sep-18	18-105-020	Whole	67
MB REF A-2	3	16-Sep-18	18-105-021	Whole	57
MB REF A-3	1	19-Sep-18	18-105-022	Whole	63
MB REF A-3	2	19-Sep-18	18-105-023	Whole	104
MB REF A-3	3	19-Sep-18	18-105-024	Whole	43

Sample Processing

Sorting:

All samples were sorted using dissecting microscopes at 10–40x magnification by trained personnel. All debris in each sample was checked microscopically, including leaves, elutriated gravel, and other large debris. To minimize potential sorter bias, samples were distributed among technicians such that no one person sorted all the replicates of a given sample or station.

Sorting QA/QC:

To ensure sorting efficiency was >95%, whole and/or partial sub-samples were re-sorted. Sorting efficiency was calculated using the following equation (where total count = final total number of organisms in sample):

Sorting efficiency =
[total count – (organisms recovered in spot check and/or re-sort)] / total count × 100%

Due to low sample volumes all debris was sorted and rechecked during the identification process. All samples checked must meet or exceed 95% sorting efficiency. Any samples falling below 95% sorting efficiency were re-sorted in their entirety, and additional checks were undertaken as necessary. Refer to Table 2 for sorting efficiency results.

Table 2. Summary of sorting QA/QC results for Golder Rankin Inlet 2018.

Client Sample ID	Replicate	Biologica Sample ID	Sorting Efficiency QC
MB E-1	1	18-105-001	100.00%
MB E-1	2	18-105-002	100.00%
MB E-1	3	18-105-003	100.00%
MB E-2	1	18-105-004	100.00%
MB E-2	2	18-105-005	100.00%
MB E-2	3	18-105-006	100.00%
MB E-3	1	18-105-007	100.00%
MB E-3	2	18-105-008	100.00%
MB E-3	3	18-105-009	100.00%
MB E-4	1	18-105-010	100.00%
MB E-4	2	18-105-011	100.00%
MB E-4	3	18-105-012	100.00%
MB E-5	1	18-105-013	100.00%
MB E-5	2	18-105-014	100.00%
MB E-5	3	18-105-015	100.00%
MB REF A-1	1	18-105-016	100.00%
MB REF A-1	2	18-105-017	100.00%
MB REF A-1	3	18-105-018	100.00%
MB REF A-2	1	18-105-019	100.00%
MB REF A-2	2	18-105-020	100.00%
MB REF A-2	3	18-105-021	100.00%
MB REF A-3	1	18-105-022	100.00%

Client Sample ID	Replicate	Biologica Sample ID	Sorting Efficiency QC
MB REF A-3	2	18-105-023	100.00%
MB REF A-3	3	18-105-024	100.00%
		Average:	**100.00%**

Identification:

All organisms were identified using a combination of dissecting (10–40x) and compound microscopes (100–1000x) and standard taxonomic keys (see methodological and taxonomic references) to the lowest practicable level (species whenever possible). All specimens were archived in air-tight glass vials with glycerin and 70% ethanol for long-term storage. Taxonomic data were recorded in Biologica's custom database.

Data Management

All data were recorded in Biologica's custom database. Results were provided to the Golder project manager in Excel spreadsheets via email.

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APPENDIX C – MODELLING ASSESSMENT OF GROUNDWATER DISCHARGE INTO MELVIN BAY 2019

TECHNICAL MEMORANDUM

DATE February 1, 2019 **Project No.** Doc718_1773384 _Rev0

TO Manon Turmel
Agnico Eagle Mines Ltd.

CC Ryan Vanengen, Carolina Leseigneur Torres

FROM Shouhong Wu and Bruce Dean, Golder Associates Ltd. **EMAIL bruce_dean@golder.com**

MODELLING ASSESSMENT OF GROUNDWATER DISCHARGE INTO THE MELVIN BAY MARINE ENVIRONMENT, REV B

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by Agnico Eagle Mines Limited (Agnico Eagle) to undertake a modelling assessment of groundwater discharge into the marine environment near Rankin Inlet. This modelling assessment consisted of nearshore oceanographic modelling of the discharge. The study did not include geotechnical, structural or hydraulic engineering assessments of the outfall. This technical memorandum was updated to account for an additional modelling scenario and updated baseline data collected by Golder from Melvin Bay in September 2018 as well as to account for increased discharge velocity resulting from a change to the diffuser port size. This memorandum should be read in conjunction with "Important Information and Limitations of this Report".

1.1 Scope of Work

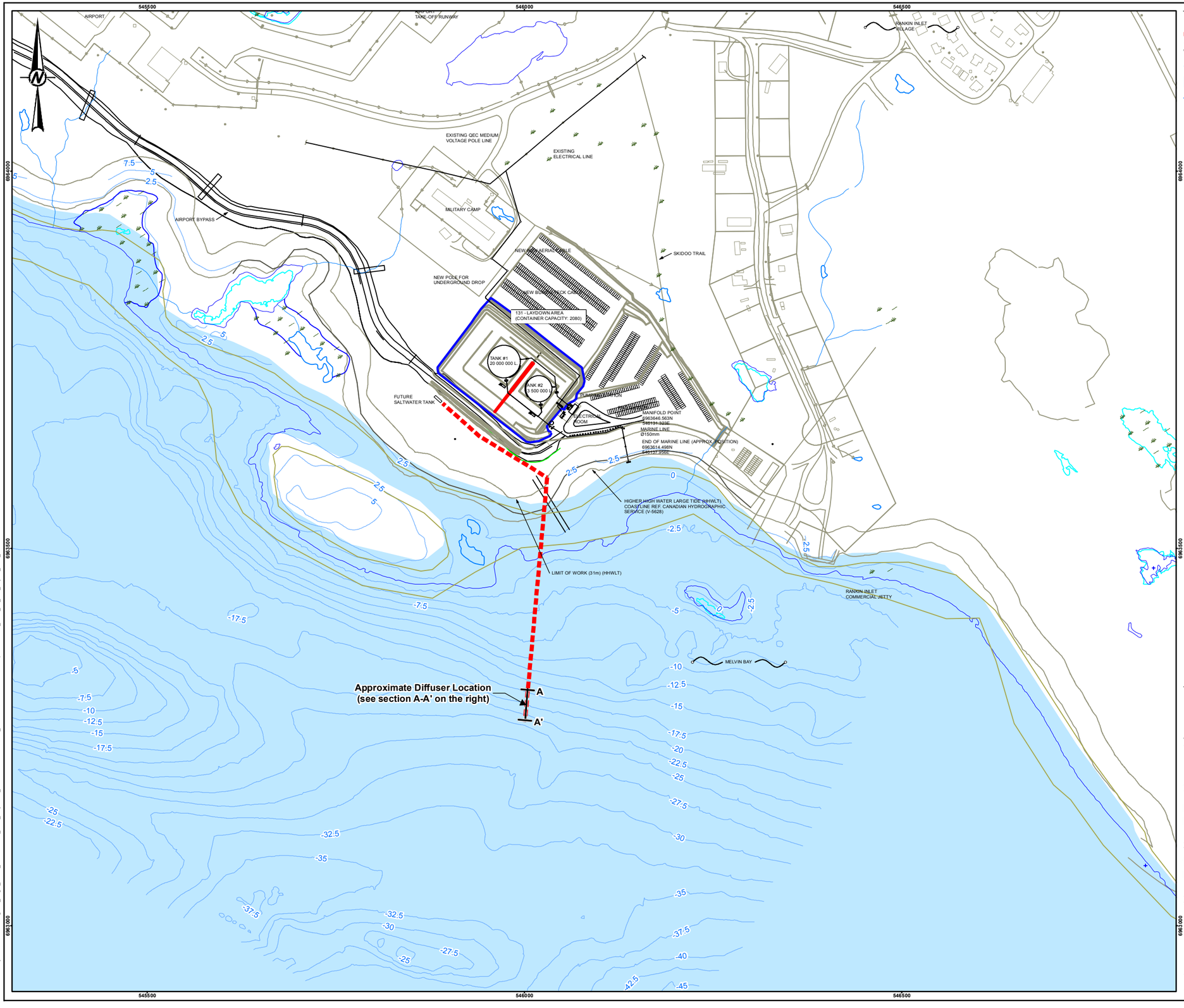
The objective of this work is to assess the near field mixing of the treated groundwater effluent disposal with respect to relevant environmental guidelines. The scope of the work includes:

- Near field modelling of dispersion of treated groundwater effluent plume using CORMIX (Doneker and Jirka 2007).
- Assess the plume dilution behavior.

For the purpose of this scope of this work, it is assumed that the discharges will consists of only pumped water at quantities and qualities per the estimated underground inflow volumes (Golder 2016) and estimated groundwater inputs to surface storage for management (Agnico Eagle 2017). Section 2.1 describes the modelling conditions.

1.2 Physical Setting

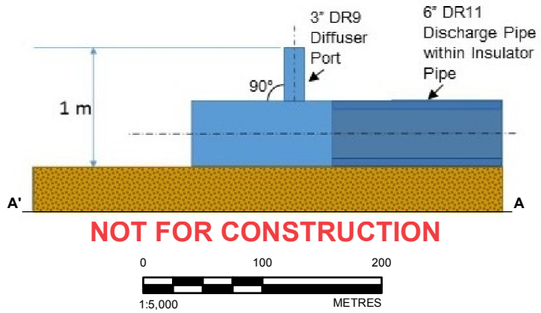
In September 2018, a field program was conducted by Golder in Melvin Bay. Field parameters measured included temperature, conductivity, pH, dissolved oxygen, salinity, and oxidation-reduction potential. The measurement depth ranged from 0.3 m to 26.7 m at three different locations in Melvin Bay (i.e., the exposure area and two new reference areas). The field measurement results are summarized in Appendix A. Nearshore bathymetry (Agnico Eagle 2017 data) and the approximate discharge location is shown in Figure 1, to the south of the Tank Farm at the Itivia Fuel Storage Facility. Based on the bathymetry of Melvin Bay at Itivia Harbour, the diffuser would be placed on the seabed at a depth of approximately 20 m, to ensure an unconstrained mixing zone and to avoid interference with use of Itivia Harbour by ships and boats at high and low tide.



LEGEND

- GENERAL AREA FOR THE DIFFUSER LOCATION
- CROSS SECTION LOCATION
- WATERCOURSE
- WATERBODY
- REEF

End of Discharge Pipe – Diffuser Port Design (HDPE Pipe)



NOT FOR CONSTRUCTION

0 100 200

1:5,000 METRES

REFERENCE(S)

BASE DATA OBTAINED FROM AGNICO EAGLE MINES LIMITED.
DATUM: NAD 83 PROJECTION: UTM ZONE 15

CLIENT

AGNICO EAGLE MINES LIMITED

AGNICO EAGLE

PROJECT

MELIADINE GOLD MINE
NUNAVUT

TITLE

SITE LAYOUT
ITIVIA HARBOUR SITE

CONSULTANT

GOLDER

YYYY-MM-DD	2019-02-14
DESIGNED	CLT
PREPARED	CDB/MH
REVIEWED	BD
APPROVED	MT

PROJECT NO.	CONTROL	REV.	FIGURE
1773384	9000	0	1

2.0 NEAR FIELD MODELLING

The Cornell Mixing Zone Expert System (CORMIX; Doneker and Jirka 2007) was applied to calculate numerical simulations of the near-field mixing and dilution behavior of treated groundwater effluent entering the nearshore coastal receiving environment in Melvin Bay. CORMIX is one of the most extensively applied models for predicting near-field discharge plume mixing and dilution of both conservative and non-conservative substances in surface water bodies. CORMIX calculates plume boundary interactions to estimate plume fate in terms of dilution and geometry relative to mixing zone regulations (Doneker and Jirka 2007). Nearshore ambient and treated groundwater effluent characteristics required to implement the mixing model are presented in the sections that follow.

2.1 Conditions for Modelling

2.1.1 Ambient Conditions

Assumptions made to characterize the ambient conditions of the receiving marine waters are as follows:

- Weak current: Ambient current velocity of 0.01 m/s and zero wind velocity were considered for this scenario which represented a slack tide condition during ice covered season.
- Mean current: Current speed of 0.2 m/s with no wind was used for this scenario.
- Open water condition: The water temperature and TDS (salinity) were considered to be 0°C (to account for the start and end of the open water season) and 33,300 mg/L, respectively.
- Water depth at discharge location is 20 m.

2.1.2 Discharge Conditions

Following discharge conditions based on estimated underground inflows were used for the near field mixing analysis:

- Flow rate of 800 m³/d discharged over a 12 hour period (for an equivalent flow rate of 1,600 m^3/day), with TDS of 39,600 mg/L.
- Treated groundwater effluent temperature: 0°C.
- Outfall length: 230 m from the shoreline as shown.
- A single nozzle for discharge which has inside diameter of 68.07 mm (standard 3.0 inch port, DR9 (PE 4710), 252 psi) was used.
- Nozzle elevation from seabed: 1 m.
- Direction of discharge is perpendicular to the bathymetry contour and 90° vertical angle (upward port).

2.1.3 Modelling Scenarios

Table 1 lists the combination of effluent flow rate and ambient current speed in two simulation scenarios. Table 2 lists the CORMIX model input parameters. The target dilution at the edge of the near-field mixing zone is 11 as per analysis presented in Appendix B.

Table 1: Modelling Scenarios

Parameter	Scenario	
	1	2
Treated Groundwater Effluent Rate (m^3/d)[1]	1,600	1,600
Ambient Current Speed (m/s)	0.01	0.20
Discharge Velocity (m/s)	5.1	5.1

Note: 1. Daily flow rate is 800 m^3/day but this volume will be discharged over 12 hours for an equivalent flow rate of 1,600 m^3/day.

Table 2: CORMIX Model Input Parameters

Parameter	Value	Source
Depth at Discharge	20 m	Based on 2017 bathymetry survey completed by Agnico Eagle
Coastal Current (Velocity)	Low = 0.01 m/s Mean = 0.2 m/s	Based on CCG (2008) and assumed
Roughness Value	0.020	Assumed (equivalent to minimum roughness value of similar seabed). This value does not affect vertical jet results.
Wind Speed	0 m/s	Assumed
Water Condition	Saline, non-stratified	Based on Agnico Eagle (2014) and confirmed through Sep. 2018 sampling
Ambient water temperature	Open water season (start and end condition): 0°C	Conservative estimate to capture the start and end of the open water season for discharge
Effluent Flow Rate	1,600 m^3/d[1]	Per underground inflow and storage estimates (Agnico Eagle 2014; Golder 2016)
Effluent Temperature	0°C	Based on Diamond Drill Hole groundwater data (Agnico Eagle 2017)
Effluent Concentration	100%	Assumed
Discharge Type	Single Port	Assumed
Distance from Nearest Bank	230 m	Assumed
Horizontal Angle of Discharge	Perpendicular to bathymetric contour	Assumed
Vertical Angle of Discharge	90°	Assumed
Port Height above Seabed	1.0 m	Assumed
Port Diameter	0.0681 m	Assumed (3.0” port, DR 9, 252 psi)

Note: 1. Daily flow rate is 800 m^3/day but this volume will be discharged over 12 hours for an equivalent flow rate of 1,600 m^3/day.

3.0 RESULTS

Figures 2 and 3 present the near-field treated groundwater effluent plume dilution for a discharge of 800 m^3/day (an effective effluent rate of 1,600 m^3/d) in weak and mean ambient current conditions respectively, via the diffuser. For weak ambient current conditions, the maximum plume (centreline) height is 11.1 m from the seabed. For mean current conditions, the maximum plume (centreline) height is 5.6 m above the seabed. After reaching the maximum height, the negatively buoyant plumes settle towards the bottom as gravity starts to dominate over the initial jet momentum, and this is illustrated by the plume centrelines of Figures 2 and 3. For both scenarios, the plume centreline dilution factor reaches 11 within 1 m horizontal distance and 6 m vertical distance above the port. At

100 m distance from the diffuser, the dilution factors are 70 and 470 for scenarios 1 and 2 respectively, which are much higher than the required dilution of 11.

Figure 4 shows the changes in chloride concentration along the centrelines of the plumes, illustrating that at less than 5 m distance from the diffuser, the chloride concentration meets the required criteria. Figure 5 shows the changes in TDS concentration along the centrelines of the plumes, illustrating that at less than 1 m distance from the diffuser, the TDS concentration meets the required criteria.

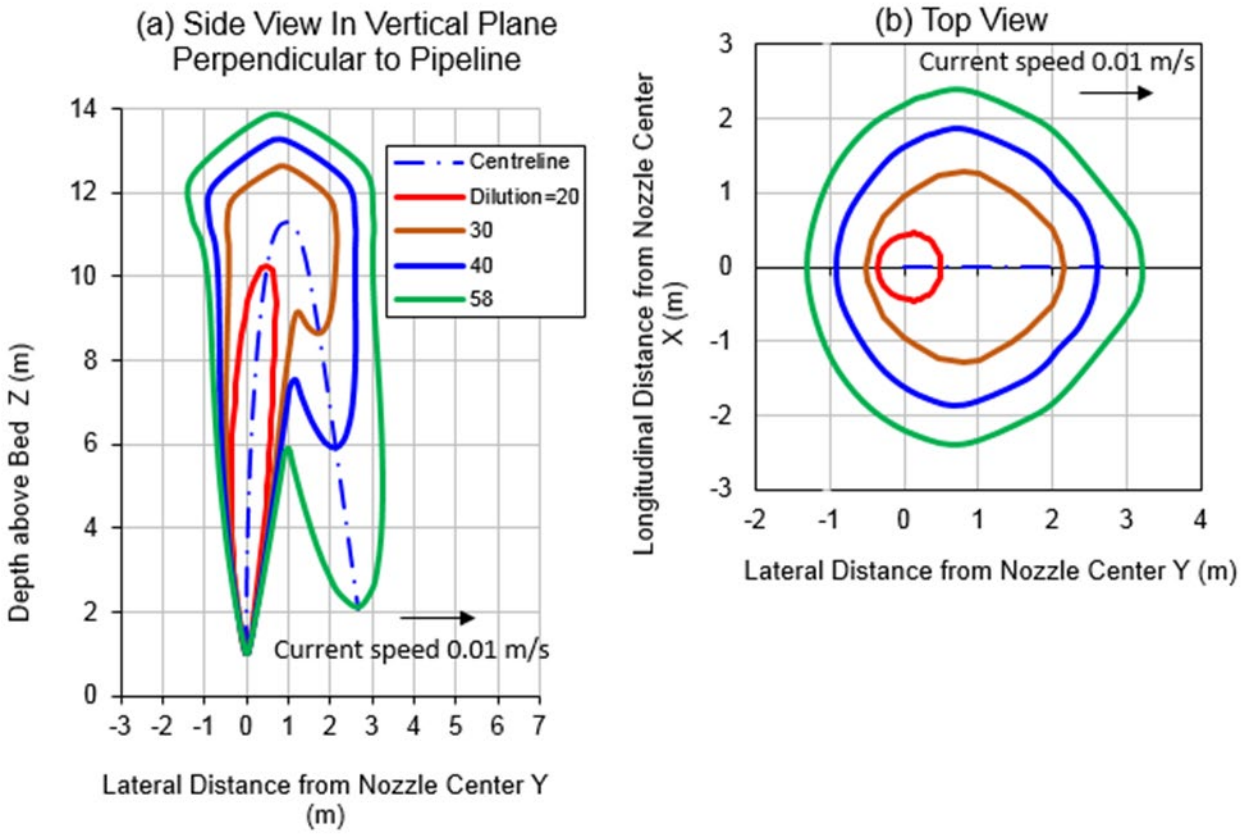


Figure 2: Dilution contours for a flow rate of 800 m^3/day (effective effluent flow rate of 1,600 m^3/d) in weak ambient current

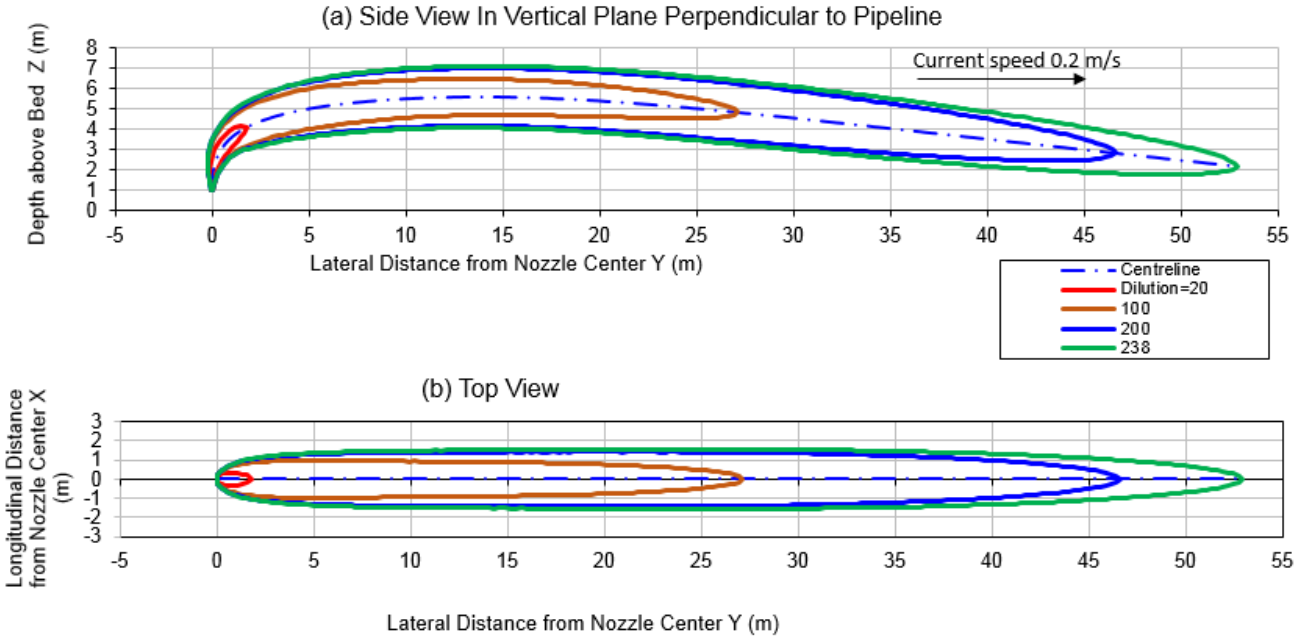


Figure 3: Dilution contours for a flow rate of 800 m^3/day (effective effluent flow rate of 1,600 m^3/d) in mean ambient current

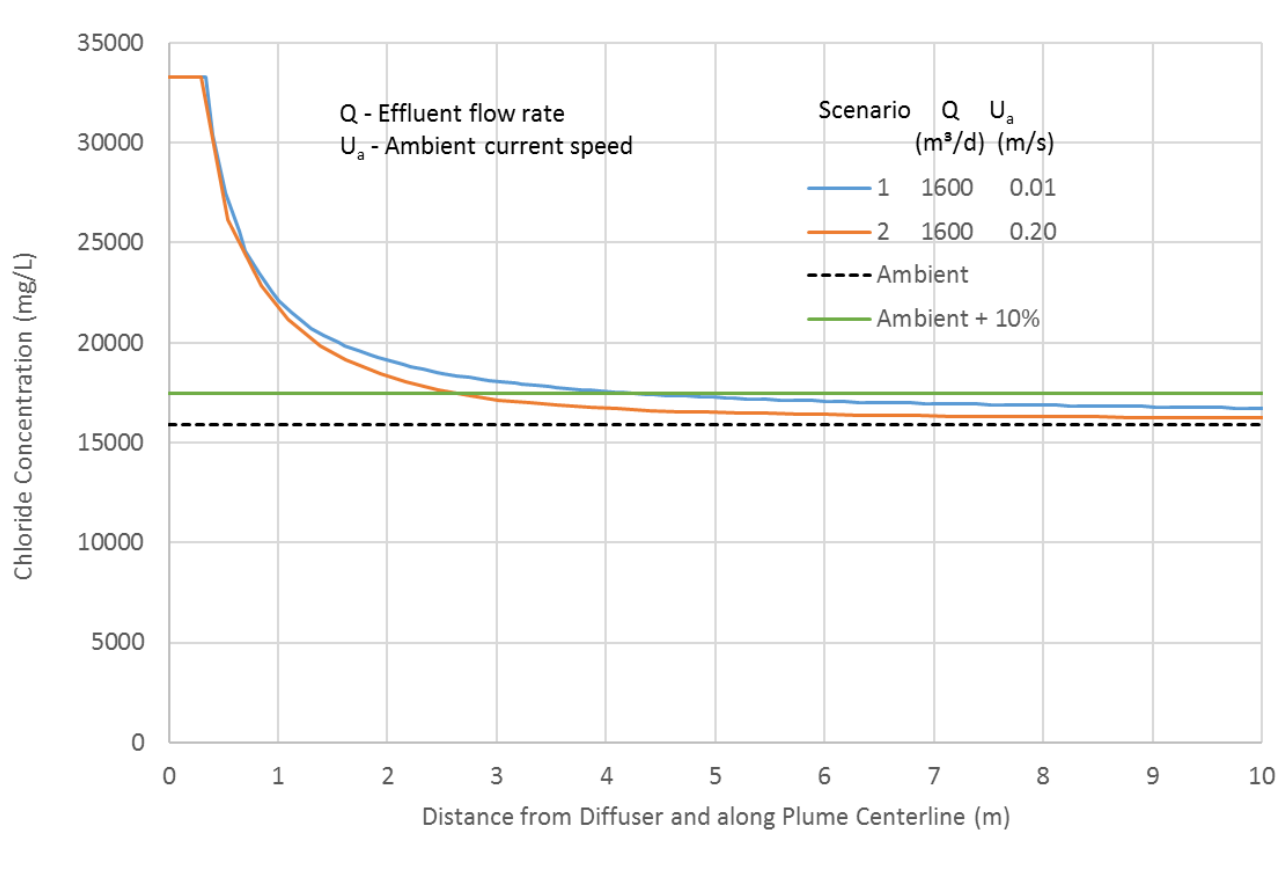


Figure 4: Chloride concentration along the plume centreline for both scenarios

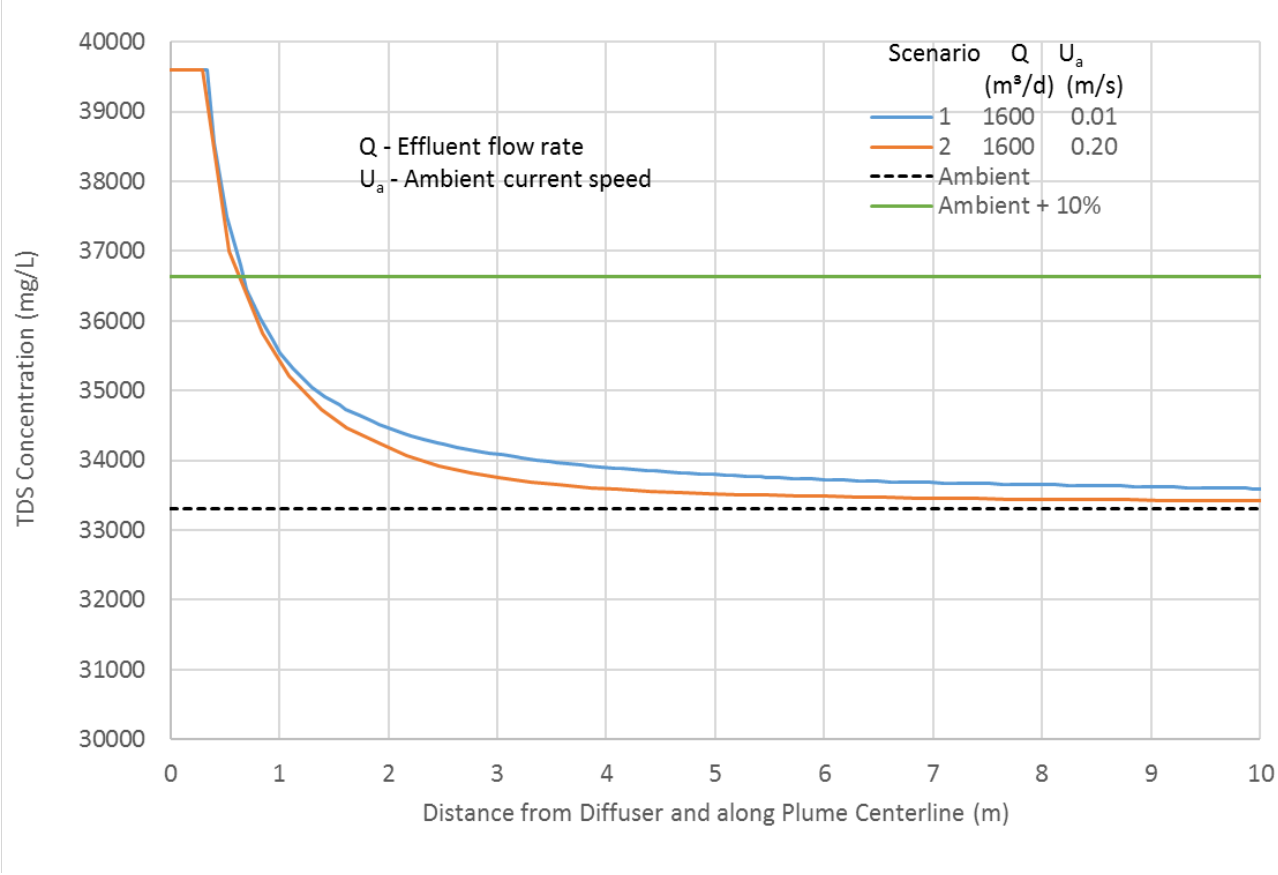


Figure 5: TDS concentration along the plume centreline for both scenarios

3.1 Temperature Sensitivity Analysis

For the simulated scenarios (800 m^3/day discharged over 12 hours for an effective flow rate of 1,600 m^3/day under weak and mean ambient current conditions), a sensitivity analysis simulation was conducted to review the effect of effluent and ambient temperature changes. The simulation conditions were otherwise identical to those for scenarios 1 and 2 except that the effluent temperature was increased to 20°C, and the ambient water temperature was increased to 8.5°C. The 20°C effluent temperature is understood to be the highest (though not expected) possible effluent temperature, as communicated by Agnico Eagle in November 2018. The 8.5°C was the water temperature measured in August 2011 at depth of 13 m below water surface (Stantec 2012).

The effluent temperature change results in effluent density change from 1031.85 kg/m³ to 1028.30 kg/m³, and the ambient water temperature change results in ambient water density change from 1026.76 kg/m³ to 1025.89 kg/m³. The temperature changes result in a slight change of the density difference between effluent and ambient water from 5.09 kg/m³ to 2.41 kg/m³. The plumes remain negatively buoyant with this temperature change, but not as strongly negative as under the original temperature assumptions for the ambient and effluent temperatures (both 0°C).

Table 3 summarizes the simulation results for sensitivity analysis on temperature change for the two scenarios. This table illustrates the following:

- The plumes rise to higher elevations than the plumes with the originally assumed temperature of 0°C due to reduced negative buoyancy.
- Similar to the original discharge plumes, the required dilution is met at less than 1 m distance from the diffuser.
- At an effective flow rate of 1,600 m³/day, the dilution factors at 100 m from the diffuser are increased due to accelerated plume mixing.

Table 3: Summary of simulation results for effluent temperatures of 20°C and ambient temperature of 8.5°C

Parameter	Scenario	
	1	2
Effluent flow rate (m³/d)[1]	1,600	1,600
Ambient current velocity (m/s)	0.01	0.2
Horizontal distance (m) from diffuser where required dilution of 11 is met	<1	<1
Maximum plume (centerline) height (m)	16.2	6.3
Dilution factor at 100 m from diffuser	163	563
Simulation results for originally assumed temperatures of 0°C		
Maximum plume (centerline) height (m)	11.1	5.6
Dilution factor at 100 m from diffuser	70	470

Note: 1. Daily flow rate is 800 m³/day but this volume will be discharged over 12 hours for an equivalent flow rate of 1,600 m³/day.

4.0 CONCLUSIONS

Mixing analysis was conducted for a diffuser designed for Melvin Bay, Rankin Inlet NWT. The simulation results show the following:

1) Dilution of the treated groundwater effluent plume is achieved within 5 m of the diffuser under the assumed conditions for the ambient and discharge conditions tested under assumed and increased temperatures.

2) After initial mixing, the plume migrates along the seabed under gravity and achieves further dilution and mixing with ambient water; concentrations within the 100 m regulatory mixing zone will thus meet discharge criteria per regulatory requirements and/or background concentrations for non-regulated parameters per the modelled conditions.

3) The results are valid for placement of the diffuser in Melvin Bay in water depths of at least 20 m.

4) Sensitivity analysis was performed for increased effluent and ambient temperatures. The required dilution of 11 is met within 1 m of the diffuser and dilution factors at 100 m from the diffuser were increased from the base case.

CLOSURE

Should you require any further information, please contact the undersigned.

Golder Associates Ltd.

APEGA PERMIT TO PRACTICE #05122

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K. Bruce Dean, M.Sc., P.Eng.
Principal, Senior Coastal Engineer

SW/BD/vm/tt

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IMPORTANT INFORMATION AND LIMITATIONS OF THIS REPORT

Standard of Care: Golder Associates Ltd. (Golder) has prepared this report in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering and science professions currently practising under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and physical constraints applicable to this report. No other warranty, expressed or implied is made.

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Unless otherwise stated, the suggestions, recommendations and opinions given in this report are intended only for the guidance of the Client in the design of the specific project. The extent and detail of investigations, including the number of test holes, necessary to determine all of the relevant conditions which may affect construction costs would normally be greater than has been carried out for design purposes. Contractors bidding on, or undertaking the work, should rely on their own investigations, as well as their own interpretations of the factual data presented in the report, as to how subsurface conditions may affect their work, including but not limited to proposed construction techniques, schedule, safety and equipment capabilities.

APPENDIX A

Field Measurements

Table A1: Results for September 2018 Measurements

Parameter	Minimum	Maximum	Average
pH (pH)	7.96	7.98	7.97
Salinity (psu)	29.7	30.5	30.0
TSS (mg/L)	<2	3.8	2.4
TDS (mg/L)	33,300	36,000	34,727
Hardness (as (CaCO3) (mg/L)	4,890	5,180	5,000
Conductivity (uS/cm)	45,400	46,500	45,782
Temperature (°C)	5.80	6.13	5.92
Chloride (mg/L)	15,900	17,400	16,655

Source: Golder (2018)

APPENDIX B

Environmental Guidelines

The intention of the treated groundwater effluent discharge objectives is to set the allowable effluent concentrations at the end-of-pipe and edge of a regulatory mixing zone. These allowable concentrations can then be used to design the diffuser to achieve the required dilution within the mixing zone. There is no specific definition for size of a mixing zone for discharges to Canadian coastal and estuarine waters. However, a radius of 100 m from the point of discharge is widely used for environmental compliance assessments. For example, the Guidelines for the Discharge of Treated Municipal Wastewater in the Northwest Territories (NWT 1992) provide guidance that the limits of initial mixing zone are 100 m from all points of discharge. For the current study, a 100 m regulatory mixing zone was applied.

Final effluent quality included in the model and assessment was based on measured groundwater quality from the borehole samples (see Section 3.4.2, Table 3 of the FEIS Addendum) and constrained by various regulations and guidelines to achieve non-acutely lethal effluent that will meet chronic guidelines or background concentrations at the edge of the regulatory mixing zone. The regulations and guidelines considered included:

- The proposed Metal and Diamond Mining Effluent Regulations (MDMER; GC 2017).
- Acute water quality guidelines for protection of marine aquatic life (CCME 2003; BC MOE 2017a, b).
- Fisheries and Oceans Canada Measures to Avoid Causing Harm to Fish and Fish Habitat (DFO 2013).

Table B1: Meliadine Mine – Assumed Treated Groundwater Effluent Discharge Criteria

Parameter	Units	Discharge Criteria	
		Standard Based [1]	95 UCLM [2]
pH (pH units)	pH units	-	7.634
Alkalinity (as $CaCO_3$)	mg/L	-	71.35
Total Hardness (as $CaCO_3$)	mg/L	-	14101
Turbidity	NTU	-	90.54
Total Dissolved Solids (TDS)	mg/L	-	58,165
Total Suspended Solids (TSS)	mg/L	15	159.4
Aluminium	mg/L	-	1.832
Ammonia (as N)	mg/L	5.91	35.47
Antimony	mg/L	-	0.0047
Arsenic	mg/L	0.0125	0.0193
Barium	mg/L	-	0.299
Beryllium	mg/L	-	0.00165
Bicarbonate (as $CaCO_3$)	mg/L	-	69.09
Boron	mg/L	-	2.389
Total Organic Carbon (TOC)	mg/L	-	6.448
Dissolved Organic Carbon (DOC)	mg/L	-	5.69
Cadmium	mg/L	-	5.83E-04
Calcium	mg/L	-	2164
Chloride (dissolved)	mg/L	-	33274
Chromium	mg/L	-	<0.1[3]
Copper	mg/L	0.003	0.113

Table B1: Meliadine Mine – Assumed Treated Groundwater Effluent Discharge Criteria

Parameter	Units	Discharge Criteria	
		Standard Based (1)	95 UCLM (2)
Cyanide (free)	mg/L	0.001	0.0494
Iron	mg/L	-	13.37
Lead	mg/L	0.14	0.00369
Lithium	mg/L	-	3.33
Magnesium	mg/L	-	2129
Manganese	mg/L	-	1.076
Mercury	mg/L	-	4.01E-05
Molybdenum	mg/L	-	0.0181
Nickel	mg/L	0.5	0.0208
Nitrate (as N)	mg/L	1500	35.65
Nitrite (as N)	mg/L	-	2.156
Total Kjeldahl Nitrogen (TKN)	mg/L	-	55.4
Phosphorus	mg/L	-	0.069
Potassium	mg/L	-	514.2
Radium-226 (Ra 226)	Bq/L	0.37	2.498
Selenium	mg/L	-	0.0457
Silica (reactive)	mg/L	-	19.77
Silver	mg/L	0.003	8.10E-04
Sodium	mg/L	-	14784
Strontium	mg/L	-	65.21
Sulfate	mg/L	-	3160
Thallium	mg/L	-	3.57E-04
Tin	mg/L	-	<0.5(3)
Titanium	mg/L	-	0.187
Uranium	mg/L	-	0.00168
Vanadium	mg/L	-	<0.5(3)
Zinc	mg/L	0.055	0.133

Notes:
"<" Concentration is below the reported detection limit (RDL).
(1) End of pipe discharge criteria is based on the minimum of the following (refer to Tables 8 and 9 of the FEIS Addendum):
Amended Metal and Diamond Mining Effluent Regulations (MDMER; GC 2017) Schedule 4 Authorized Limits of Deleterious Substances - Maximum Authorized Monthly Mean Concentration.
Canadian Council of Ministers of the Environment (CCME 2003) Short-term Water Quality Guidelines (WQG) for the Protection of Aquatic Life - Marine.
British Columbia Ministry of Environment (BC MOE 2017a) Approved Water Quality Guidelines for Marine Aquatic Life (Short-Term).
BC MOE Working Water Quality Guidelines for Marine Aquatic Life (BC MOE 2017b).
(2) 95% Upper Confidence Level of the Mean (UCLM) of the August 2016 to September 2017 diamond drillhole groundwater data provided by Agnico Eagle. 95% UCLM calculated using the US EPA ProUCL Version 5.1 software. Agnico Eagle will monitor groundwater quality and criteria will be updated as necessary based on observed changes.
(3) A 95% UCLM could not be calculated due to low detection rates within the dataset. The maximum concentration has been used for conservative purposes.

In addition to the above and since chloride ions mainly constitute the salt content in the marine water and ultimately the treated groundwater effluent plume, chloride guidelines are used to assess the near-field mixing zone. No local or federal guideline was available for chloride discharges in the marine environment, and therefore, the guideline published by the BC MOE (2017a) was used for the analysis. The guideline states:

> *"Human activities should not cause the chloride of marine and estuarine waters to fluctuate by more than 10% of the natural chloride expected at that time and depth".*

This indicates that the chloride concentration at the mixing zone boundary should not exceed the ambient chloride concentration of 15,900 mg/L by 1,590 mg/L (10%). The behavior of the discharge in the marine environment is influenced by density. For the purposes of this assessment, it is assumed that treatment of the groundwater will be such as to achieve a TDS concentration of the treated groundwater effluent that is +/- 10% (in line with the BC MOE 2017a guideline) of the maximum TDS concentration of 36,000 mg/L measured in September 2018 at Melvin Bay. Therefore, the assumed effluent TDS concentration will be up to approximately 39,600 mg/L. It is conservatively assumed that the chloride concentration of 33,300 mg/L remains unchanged in the treated groundwater effluent.

To reach a chloride concentration difference of no more than 10% at the edge of regulatory mixing zone, the required plume dilution factor via the diffuser is 11, per the equation below:

$$S = \frac{C_{eff} - C_a}{C_{edg} - C_a} = \frac{C_{eff} - C_a}{110\% C_a - C_a} = \frac{33{,}300 - 15{,}900}{110\% * 15{,}900 - 15{,}900} = 11$$

where S is required dilution factor, C_{eff} is effluent chloride concentration (33,300 mg/L), C_a is ambient chloride concentration (15,900 mg/L), and C_{edg} is chloride concentration at the edge of regulatory mixing zone. Per the BC MOE (2017a) guideline, the upper bound of C_{edg} is 10% greater than ambient chloride concentration.

There are also no federal or provincial specific criteria for mixing zone discharges regarding thermal changes to the marine environment. However, per the BC MOE (2017a) guideline:

> *"Temperature at the mixing zone boundary should not change by more or less than 1°C from natural ambient background temperatures, and the hourly rate of change should not exceed 0.5°C."*

This is taken into consideration for the model, which conservatively assumes treated groundwater effluent discharge and ambient ocean temperatures of 0°C, to account for start and end of temperatures for the open water season.