BACK RIVER PROJECT

2018 Annual Report for

Water Licence 2BC-BRP1819 (Development Works)

Prepared by
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Prepared for
Nunavut Water Board

March 2019

BACK RIVER PROJECT
2018 2BC-BRP1819 Annual Report

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Acronyms

CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
Inspector	CIRNAC Inspector
KIA	Kitikmeot Inuit Association
The Licence	Water Licence 2BC-BRP1819
MLA	Marine Laydown Area
NIRB	Nunavut Impact Review Board
NU	Nunavut
NWB	Nunavut Water Board
The Project	Back River Project
Sabina	Sabina Gold & Silver Corp.

Executive Summary - English

Sabina Gold & Silver Corp. (Sabina) has filed its Annual Report on its activities during 2018 under Water Licence No. 2BC-BRP1819 (the Licence) issued by the Nunavut Water Board. As set out in Part B Item 4 of the Licence, the report includes information with respect to the following topics:

- A summary report of Water use;
- A list of unauthorized discharges and a summary of follow-up actions taken;
- Any revisions to the following:
    - Road Management Plan,
    - Quarry Management Plan,
    - Fuel Management Plan,
    - Spill Contingency Plan,
    - Interim Closure and Reclamation Plan and Assessment of Current Restoration Liability,
    - Environmental Management and Protection Plan; and
    - Quality Assurance / Quality Control Plan.
- A description of all progressive and or final reclamation work undertaken, if any, including photographic records of site conditions before, during and after completion of operations;
- A summary of any information requested and results of the Monitoring Program;
- A summary of any relevant construction activities or Modifications and/or major maintenance work carried out on facilities under this Licence and an outline of any work anticipated for the next year;
- A discussion on the performance, installation, and evaluation of the primary and secondary containment functions used in fuel storage to safeguard impacts to freshwaters;
- An updated estimate of the current restoration liability as described in Part I, Item 1, based upon the results of restoration assessment, project development monitoring, and any changes or Modifications to the project;
- A summary of public consultation/participation, describing consultation with local organizations and residents of the nearby communities, if any were conducted;
- An executive summary in English and Inuktitut of all plans, reports, or studies conducted under this Licence; and
- Any other details on Water use requested by the Board by the 1st November of the year being reported.

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ᓴᐲᓇ ᔨᓗ ᐊᓯᒪᓗ ᓴᓇᓕᓐᓂᕕᒃᑯᑦ (ᓴᐲᓇ) ᐊᖏᕐᕕᒋᑦᑕᒪᖅ ᐅᓂᒃᑲᖓᓐᓂᒃ ᑐᓂᓯᔪᐅᑎᒃᑐᑦ ᖃᓄᐃᓇᓕᐅᕙᓂᓐᓚᖓᑕᑦ ᒥᐦᓴᓄᑦ 2018-ᒥᑦ ᒪᓕᒃᖢᑐᒍ ᐃᒪᖏᒧᑦ ᓕᐃᓴᖅᓱᓂ ᐅᓴᐅᑎᖓᓐᓄ 2BC-BRP1819 (ᓕᐃᓴᖅᓱᓂ) ᑐᓂᓴᐅᓯᖅ ᓄᓇᕗᓴᒥ ᐃᒪᓕᓐᓂᕕᒃᑯᓄᓇᑦ. ᐅᖏᖅᓯᓯᒪᓂᖓᑐᑦ ᐃᓕᓐᓄᓂᑦ B-ᒥᑦ ᑎᑎᖅᑲᖅ 4 ᓕᐃᓴᖅᓱᒥᑦ, ᐅᓂᒃᑲᒥᑦ ᐃᓕᐅᔨᑦ ᑐᑭᓯᐅᒪᔪᐊᕐᑎᑦ ᐱᔪᐊᖏᑲᖅᑐᑦ ᐅᑯᓂᖓᓕᑦ:

- ᓇᐃᓇᖅᓯᒪᔪᖅ ᐅᓂᒃᑲᖅ ᐃᒪᖏᑲ ᐊᑐᖏᓪᓗᑦ;
- ᑎᑎᕋᖅᓯᒪᔪᑦ ᐱᔪᖁᖅᑎᑕᐅᓯᒪᓕᖅᑭᑐᓴᑎᒃ ᑯᕐᓯᓂᑦ ᐊᓕᓗ ᓇᐃᓇᖅᓯᒪᔪᖅ ᖃᐅᔨᓴᐅᐊᕆᒃᓂᓕᕆᐅᔨᑦ;
- ᐊᓕᓗ ᐋᖅᑭᑎᐊᖅᓯᓂᐅᔨᑦ ᐅᑯᓂᖓᑦ:
    - o ᐊᑦᕋᑯᑎᑦ ᒥᐊᓂᓚᐅᓂᖓᓗᓂᑦ <ᕋᓇᐅᑦ,
    - o ᓄᓇᒥᑦ ᐃᓗᑐᖅᑎᓚᓂᖓᒧᑦ ᐊᐅᓪᓛᑎᓂᖓᒥᒃ <ᕋᓇᐅᑦ,
    - o ᐅᖅᓯᐊᓗᖓᒥᒃ ᒥᐊᓂᖅᓯᓂᖓᒧᑦ <ᕋᓇᐅᑦ,
    - o ᑯᕐᕕᖏᓂᖅᑦᑦ ᖃᐅᔨᓴᐅᓂᐊᕋᖅᓂᖅ <ᕋᓇᐅᑦ,
    - o ᐅᖅᑯᐊᖅᑦᓪᓕᐊᓂᖓᒧᑦ ᐊᓕᓗ ᐅᑎᖅᑎᑎᓚᐅᓪᓕᐊᓂᖓᒧᑦ <ᕋᓇᐅᑎ ᐊᓕᓗ ᖃᐅᔨᓴᓕᓂᖅ ᐃᓐᓇᓇᐅᔨᖅ ᐃᓕᓴᖅᑯᓯᐅᓇᓐᓂᖅᑐᓗᓂᖓᒧᑦ ᐱᔪᖁᖅᑎᑎᖃᖅᑐᒃ,
    - o ᐊᐋᑎᒥᒃ ᐊᐅᓪᓛᑎᓂᖓᒧᑦ ᐊᓕᓗ ᒥᐊᓂᖅᓯᓂᖓᒧᑦ <ᕋᓇᐅᑎ; ᐊᓕᓗ
    - o ᖃᐅᔨᓴᐅᓐᓂᖓᒧᑦ ᖃᐅᔨᓴᓕᓂᖅ/ᖃᐅᔨᓴᐅᓐᓂᖓᒧᑦ ᐊᐅᓪᓛᑎᓂᖓᒥᒃ <ᕋᓇᐅᑎ.
- ᖃᐅᔨᓴᑦᑐᓂᖓᓐᓄ ᑕᓗᓂᑲᒃᖢ ᐱᐋᓪᓚᐊᓂᐅᔨᑦ ᐊᓕᓗ ᐅᐋᖏᓚᐅᓴᐅᓂᒃᐸᒥᑦ ᐅᑎᖅᑎᑎᓚᓂᖓᒧᑦ ᐱᓚᓂᖏᓐᓄᓕᔪᑦ, ᐱᓚᕋᖅᖢᐸ, ᐃᓚᐅᔨᓗᑎᒃ ᐊᔭᓚᓪᓂᖅᑕᐅᓄᓕᔪᑦ ᐃᓂᐅᔨᑦ ᓄᐅᓂᐊᒍᑦ ᖃᐅᔨᓴᓐᓄᓚᐅᓂᖅᑕᖏᓐᓂᑦ, ᐊᐅᓵᖅᑎᑦᑎᓂᒥᑦ ᐊᓕᓗ ᐱᐊᓂᓄᓕᓚᖅᑎᓗᓂᑦ ᐊᐅᓵᖅᑎᑦᑎᓂᓐᓂᑦ;
- ᐃᓇᐃᓱᖅᓯᒪᔪᖅ ᓄᓇᕋᐃᓐᓇᓂᑦ ᑐᓂᓯᔪᖅᑕᐅᔨᑦ ᐊᓕᓗ ᖃᐅᔨᓴᓐᓂᐅᔨᑦ ᖃᐅᔨᓴᐅᐊᖃᖅᑕᕐᓂᕐᓗᑦ ᑐᑐᓐᓂᑦ;
- ᐃᓇᐃᓱᖅᓯᒪᔪᖅ ᓴᓇᕋᓕᐊᓂᖓᑦ ᖃᐅᔨᓴᓚᐅᓂᖓᓂᐅᔨᑦ ᐅᕙᓚᓐᓂᖅᓴᐅᓂᒃ/ᐅᕙᓚᓐᓂᐅᓂᒃ ᐊᖏᕐᓂᑦ ᐋᖅᑭᒃᑯᓯᐃᓂᐅᔨᑦ ᐃᓗᓐᓂᔨᐊᓂᒃ ᓄᓇᕗᑦᑐᓂᓗ ᒪᓕᒃᖢᑐᒍ ᐊᓕᓗ ᑎᑎᕋᖅᓯᒪᓗᑎᒃ ᐱᓚᓪᓕᐊᓂᖓᐊᖅᑐᑦ ᐅᑭᐅᑦ ᖃᐃᓕᑦ;
- ᐅᖅᑲᐅᓯᖅᑲᖅᑐᑦ ᖃᐃᓇᓐᓂᒃᓱᓕᓂ, ᐃᓚᐅᖅᑲᐃᓂᖅᓂᒃ, ᐊᓕᓗ ᖁᒥᖅᑭᕆᐅᓂᖓᒃ ᐊᑐᓗᐊᖅᑐᖅ ᐊᓕᓗ ᑐᓗᓂᕐᔪᐊᖅᓂᖅ ᐃᓗᐊᓂᑎᑎᓂᖓᒧᑦ ᐋᖅᑭᒃᑯᐊᒪᔪᑦ ᐅᖅᓯᐊᓂᓯᕕᒃᓴᓕᓂᑦ ᐅᓇᓗᐊᓐᖁᑎᒥᑦ ᐊᐅᖅᑯᓯᐅᓂᖓᒧᑦ ᐊᓕᓗ ᑎᑎᕋᖅᓯᒪᓗᑎᒃ ᐱᓚᓪᓕᐊᓂᖓᐊᖅᑐᑦ ᐅᑭᐅᑦ ᐅᑭᐅᖅᑕᕐᓂᖅ;
- ᐅᐸᓗᒍᓕᖅᑐᓂᖅᑕᕐᓂᖅ ᐅᓪᓗᐅᑦᑕᖅᑕᐅᔨᖅ ᐃᓐᓇᐅᔨᖅ ᐃᓕᖅᑯᓯᐅᓪᓗᐊᓂᖓᓂᒃᓴᓕᓂᖅᑐᑦ ᐱᔪᖁᖅᑎᑎᖃᖅᑐᒃ ᐅᖅᑯᓯᐅᓂᖓᒧᑦ ᐊᓕᓗ 1, ᑎᑎᕋᖅᓱᖅ 1-ᒥᑦ, ᒪᓕᒃᓴᓂᑦ ᖃᐅᔨᓴᓐᓂᐅᔨᑦ ᐃᓕᖅᑯᓯᐅᓪᓗᐊᓂᖓᓂᒃᓴᓕᓂᖅᑐᑦ ᖃᐅᔨᓴᐅᓂᖓᒥᒃ, ᐱᓕᓐᓄᐊᓕᐅᔨᓴᓂᖓᒧᑦ ᖃᐅᔨᓴᐅᓂᐊᕆᒃᓂᓕᓂᖓᒧᑦ, ᐊᓕᓗ ᓄᓇᕋᐃᓐᓇᐃᓐᓇᑦ ᐊᓯᐊᓂᖓᓂᒃ ᐋᖅᑭᒃᑯᐊᒪᔪᓕᒫᓂᓕᓂᑦ ᐱᓕᓐᓄᐊᓕᖅᑐᑦ;
- ᐃᓇᐃᓱᖅᓯᒪᔪᑦ ᐃᓄᓗᓵᓂᖅ ᐅᖅᑯᖃᑎᖃᓕᖅᑐᓂᖅ/ᐃᓕᐅᖅᑕᐅᑎᑎᓂᖅᓂᑦ, ᐅᖅᑲᐅᓯᖅᑕᓗᓂ ᐅᖅᑯᖃᑎᖃᓕᖅᑐᓂᖅᑕᐅᓪᓗᐊᓂᖓᓂᒃ ᓄᓇᕗᒻᒥᑦ ᑲᑎᕐᓯᖃᑎᒌᖅᖢᒃ ᐊᓕᓗ ᐃᓄᖅᑎᖅᑐᖅ ᖃᐅᔨᓴᐅᓂᖓᒥᒃ ᐅᖅᑯᖃᑎᖃᓕᖅᑐᓂᖅᑕᐅᓪᓗᐊᓂᖓᓂᒃᓴᓕᓂᖅᑐᑦ ᖃᐅᔨᓴᐅᓂᖓᒥᒃ, ᐱᓕᓐᓄᐊᓕᐅᔨᓴᓂᖓᒧᑦ ᖃᐅᔨᓴᐅᓂᐊᕆᒃᓂᓕᓂᖓᒧᑦ, ᐊᓕᓗ ᓄᓇᕋᐃᓐᓇᐃᓐᓇᑦ ᐊᓯᐊᓂᖓᓂᒃ ᐋᖅᑭᒃᑯᐊᒪᔪᓕᒫᓂᓕᓂᑦ ᐱᓕᓐᓄᐊᓕᖅᑐᑦ;
- ᐃᓇᐃᓱᖅᓯᒪᔪᑦ ᐃᓄᓗᓵᒋᓂᖅ ᐅᖅᑯᖃᑎᖃᓕᖅᑐᓂᖅᑕᐅᓪᓗᐊᓂᖓᓂᒃᓴᓕᓂᖅᑐᑦ

1. Introduction

This report to the Nunavut Water Board (NWB) summarizes initial development work activities and monitoring undertaken at the Sabina Gold and Silver Corp. (Sabina) Back River Project (the Project) Marine Laydown Area (MLA) and Goose Lake project areas in accordance with Part B, Item 4 of 2BC-BRP1819 (the Licence). This License was issued on March 13, 2018 and will expire on April 30, 2019. The NWB Annual Report Form can be found in Appendix A of this report.

Sabina's Back River Project is located within the West Kitikmeot region of southwestern Nunavut. It is situated approximately 400 km southwest of Cambridge Bay, 95 km southeast of the southern end of Bathurst Inlet (Kingaok), and 520 km northeast of Yellowknife, Northwest Territories. The Project is located predominantly within the Queen Maud Gulf Watershed.

The Project is comprised of two main areas; the MLA situated along the western shore of southern Bathurst Inlet and the Goose Lake Area south of the MLA where the gold deposits are located. These areas are connected seasonally by an approximately 160 km long winter ice road. The majority of annual resupply is brought in by water to the MLA and necessary materials are transferred via winter ice road to the Goose Lake property.

Project initial development works began in 2018. This included the development of pads, all-weather access roads and an airstrip at the MLA, as well as the erection of a tent camp and barge off-loading area for the receipt, storage and transfer of materials necessary to support construction activities. A 2018 construction summary is provided in Section 2.H of this report.

2. Annual Report per Part B, Item 4

This section of the report has been constructed to address the requirements Part B, Item 4 of the Licence. For ease of comparison, each subheading within this section corresponds directly with the identically alphabetized subheading of Part B, Item 4 of Water Licence 2BC-BRP1819.

A. SUMMARY OF WATER USE

Under this Licence, a total water use of 297 cubic meters of water per day is authorized for use in dust suppression, construction compaction and winter ice road construction. This water may be drawn from Goose Lake, MLA Pond S1, and MLA Pond S2 (Figure 2.A-1). No water was required for the purposes encompassed by this Licence in 2018. Water used for purposes authorized under water licences 2BE-GEO1520 and 2BE-GOO1520 (such as domestic water use) are outlined in their respective annual reports.

B. QUANTITY OF WATER USE FROM INUIT OWNED LANDS

MLA Pond S1, MLA Pond S2, and Goose Lake are all located on Inuit Owned Land. As indicated in Section 2.A, no water was used under this Licence in 2018.

C. QUANTITY OF WATER USE FROM CROWN LANDS

No water sources authorized by this Licence are located on Crown Land. As indicated in Section 2.A, no water was used under this Licence in 2018.

W:\BackRiver\04_Exploration\BackRiverRegion\GIS_Products\ESRI_MXD\2018 MLA\MLA_WaterLocations.mxd

February 25 2019

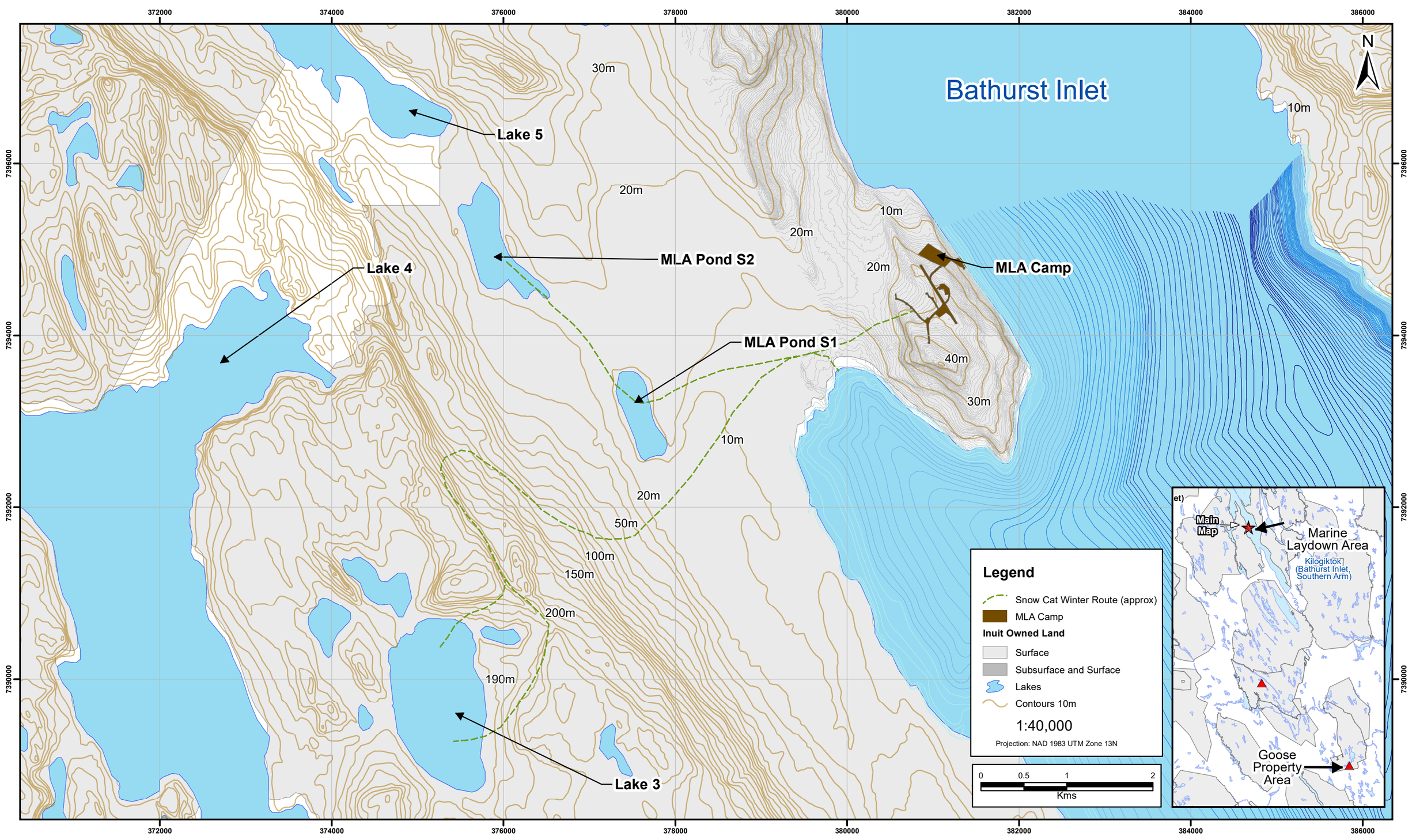


Figure 2A-1 MLA Water Locations

Sabina
GOLD & SILVER CORP.

D. UNAUTHORIZED DISCHARGES

No hydrocarbon spills to water or triggering the NWT/NU spill reporting thresholds occurred in 2018.

E. MANAGEMENT PLAN REVISIONS

Management plans applicable to this Licence are discussed individually below.

i. Road Management Plan

In fulfillment of the requirement of 2BC-BRP1819 Part E Item 2, a revised version of this plan was provided to the NWB in July of 2018. An executive summary of this plan in both English and Inuktitut has been included, with the plan, as Appendix D of this report.

ii. Quarry Management Plan

No changes were made to the approved plan in 2018.

iii. Fuel Management Plan

No changes were made to the approved plan in 2018.

iv. Spill Contingency Plan

In fulfillment of the requirement of 2BC-BRP1819 Part H Item 2, a revised version of this plan was provided to the NWB in July of 2018. An executive summary of this plan in both English and Inuktitut has been included, with the plan, as Appendix E of this report.

v. Closure and Reclamation Plan and Assessment of Current Restoration Liability

In fulfillment of the requirement of 2BC-BRP1819 Part I Item 2, a revised version of this plan was provided to the NWB in July of 2018. An executive summary of this plan in both English and Inuktitut has been included, with the plan, as Appendix F of this report.

vi. Environmental Management and Protection Plan

No changes were made to the approved plan in 2018.

vii. Quality Assurance/ Quality Control Plan

No changes were made to the approved plan in 2018.

F. PROGRESSIVE AND FINAL RECLAMATION

No reclamation activities related to this Licence were undertaken in 2018.

G. INFORMATION REQUESTS AND RESULTS OF MONITORING PROGRAM

Table 2.G-1 lists all monitoring stations applicable to this Licence and provides and overview of 2018 activity related to these stations.

Approximately 35 m^3 was discharged from the temporary MLA berms in 2018. Berm water quality results and discharge criteria are summarized in Table 2.G-2 and discharge locations and quantities are summarized in Table 2.G-3. Full laboratory results are provided in Appendix B. Although pH was initially found to be below discharge criteria in some berms, subsequent water treatment and re-testing indicated that all water met all discharge criteria outlined in the Licence prior to discharge. As discussed with the

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) Inspector (the Inspector), pH was measured in the field for berms 2 and 6 to ensure it met discharge criteria prior to discharge. Water was discharged in a manner so as to prevent erosion and direct connectivity with waterbodies.

Table 2.G-1. 2018 Monitoring Station Activity Summary

Station	Description	Purpose	Summary of Activity
BRP-G-01 to TBD	General Site Runoff during Construction	Applies anywhere on the site (Goose and MLA); monitoring for erosion and sedimentation	No runoff was observed from development works construction areas at the MLA or Goose Lake during construction activities in 2018.
BRP-S-01	Seeps or runoff (to be determined); Temporary storage areas (non-hazardous material) Quarry sites	Applies anywhere on the site (Goose and MLA); monitoring for potential seepage or runoff from excavated and/or stockpiled material Applies to any runoff from temporary storage areas Applies to any runoff from quarry sites	No runoff or seepage related to development works was identified at the MLA or Goose Lake in 2018.
BRP-18	Llama Watershed Outflow (PN04 from water and load balance)	Monitoring water quality during road construction and culvert installation	No development works construction has been initiated upstream of this site in 2018. However, baseline water quality samples were collected and are provided in Appendix B.
BRP-19	Echo Outflow (PN09 from water and load balance)	Monitoring water quality during road construction and culvert installation	No development works construction has been initiated upstream of this site in 2018. However, baseline water quality samples were collected and are provided in Appendix B.
BRP-23	Gander Pond Outflow (PN07 from water and load balance)	Monitoring water quality during road construction and culvert installation	Water samples were collected at Freshet and monthly during flow at this Station and results are provided in Appendix B and screened against Licence criteria in Table 2.G-4. Two bridges were installed at this site in favor of in-stream culverts. Daily construction monitoring confirmed no runoff occurred in 2018 and no additional water quality samples were collected.
BRP-24	Goose Lake Intake	Source intake water quality and volume for development works use	No water was withdrawn from this source for development works use in 2018.
BRP-43	MLA Fuel Tank Farm	Test quality of runoff water in the Fuel Tank Farm containment area	This facility was not yet constructed in 2018.
BRP-49	MLA Temporary Fuel Storage Facility	Test quality of runoff water in the Temporary Fuel Storage Facility secondary containment (e.g. insta-berms)	Water was discharged from this facility in 2018. Water quality results are reported in Table 2.G-2 and quantities in Table 2.G-3.

Table 2.G-2. 2018 Berm Discharge Final Water Quality Results

	Benzene (mg/L)	Ethylbenzene (mg/L)	Toluene (mg/L)	Lead (mg/L)	Oil and Grease (mg/L)	TSS (mg/L)	pH
Max Avg. Concentration*	**0.37**	**0.09**	**0.002**	**0.1**	**5 and no visible sheen**	**15**	**Between 6.0 and 9.5**
Concentration of Grab Sample*	**0.37**	**0.09**	**0.002**	**0.1**	**5 and no visible sheen**	**30**	**Between 6.0 and 9.5**
Bulk Berm 3	<0.00050	<0.00050	<0.00045	0.000144	<5.0	<3.0	6.19

Bulk Berm 4/West Bulk Berm	<0.00050	<0.00050	<0.00045	0.000362	<5.0	4.2	8.1
Bulk Berm 5	<0.00050	<0.00050	<0.00045	0.000199	<5.0	7.2	6.37
Bulk Berm 8	<0.00050	<0.00050	<0.00045	0.000094	<5.0	4	6.1
Bulk Berm 1	<0.00050	<0.00050	0.00089	0.000146	<5.0	<3.0	7.39
Bulk Berm 7	<0.00050	<0.00050	<0.00045	0.00045	<5.0	4	6.44
Bulk Berm 2	<0.00050	<0.00050	<0.00045	<0.000050	<5.0	<3.0	7.8**
Bulk Berm 6	<0.00050	<0.00050	<0.00045	0.000120	<5.0	<3.0	6.5**

*Water Licence criteria for the MLA Temporary Fuel Storage Facility and secondary containment at monitoring station BRP-49.
**Results of field measurement collected post collection of laboratory samples and prior to discharge

Table 2.G-3. 2018 Discharge Locations and Quantities

Berm	Discharge Location	Discharge Quantity (m3)
Bulk Berm 3	UTM NAD83 ZONE 13 N; N 7394413 E 381001	4.5
Bulk Berm 4/West Bulk Berm	UTM NAD83 ZONE 13 N; N 7394420 E 381015	7.0
Bulk Berm 5	UTM NAD83 ZONE 13 N; N 7394395 E 381003	4.0
Bulk Berm 8	UTM NAD83 ZONE 13 N; N 7394370 E 381016	3.5
Bulk Berm 1	UTM NAD83 ZONE 13 N; N 7394401 E 381004	4.0
Bulk Berm 7	UTM NAD83 ZONE 13 N; N 7394383 E 381007	4.0
Bulk Berm 2	UTM NAD83 ZONE 13 N; N 7394403 E 381006	4.0
Bulk Berm 6	UTM NAD83 ZONE 13 N; N 7394387 E 381008	4.0
Total		**35**

Water quality samples were collected monthly from freshet (June) through September from each of Llama, Echo and Gander outflows (BRP-18, -19 and -23 respectively). All laboratory results are provided in Appendix B. No construction took place upslope of Llama or Echo outflows in 2018. As a result, only the Gander Outflow (BRP-23) is screened against water licence criteria in Table 2.G-4; no exceedences were noted.

Table 2.G-4. BRP-23 Water Quality Results

	Max Avg. Concentration	Concentration of Grab Sample	BRP-23	BRP-23	BRP-23	BRP-23
			11-Jun-2018	14-Jul-2018	11-Aug-2018	9-Sep-2018
			11:15	16:00	14:20	14:00
			L2113424-6	L2131670-12	L2147304-2	L2162579-20
Total Suspended Solids (mg/L)	**50.0**	**100.0**	<3.0	<3.0	42.5	13.6
pH	**Between 6.0 and 9.5**	**Between 6.0 and 9.5**	6.25	6.82	6.62	6.60

Inspections that occurred during the 2018 program include:

- July 31st to Aug 2nd, Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) Water Resources inspector (the Inspector) completed an inspection of the Back River Project under Licence No. 2BE-GOO1520, 2BE-GEO1520, 2BC-BRP1819
- Aug 2 – Kitikmeot Inuit Association (KIA) complete a site visit of the Back River Project

- Aug 14 – Aug 16, NIRB Project Officer completed an inspection of the Back River Project under NIRB Project Certificate No. 007
- Oct 14 – Oct 15, CIRNAC Water Resources inspector completed an inspection of the Back River Project under Licence No. 2BE-GOO1520, 2BE-GEO1520, 2BC-BRP1819

The CIRNAC Inspector required that the temporary berms at the MLA storing lubricants and oils be restored to prevent water release, and that localized soil and water samples be collected. Sabina has subsequently repaired the necessary berms and has agreed to collect representative soil and water samples in 2019.

The Inspector also requested that all unauthorized discharges to the environment be reported and that snow build-up in instaberms be addressed prior to freshet. Sabina confirms that all unauthorized discharges to water or triggering the NWT/NU spill reporting thresholds are reported as required. No such unauthorized discharges occurred in 2018. Sabina also confirms that snow build-up in instaberms will be addressed prior to freshet to prevent possible overtopping.

H. 2018 CONSTRUCTION SUMMARY AND 2019 PLAN

i. Summary of 2018 construction activities at the MLA

MLA development works activities included:

- Tent camp erection;
- Quarrying;
- Development of:
  - Camp Pad
  - Shop Pad
  - Primary and secondary construction laydown pads
  - Freight storage pad
  - Shoreline Pad
  - Desalination Pad
  - Access roads and turnouts
  - Airstrip
  - Temporary Fuel Storage Pad
- Installation of desalination plant;
- Tertiary fuel containment instaberm erection; and
- Installation of 20 double-walled 30,000 L fuel tanks.

Infrastructure completed at the MLA in 2018 is illustrated in Figure 2.H-1.

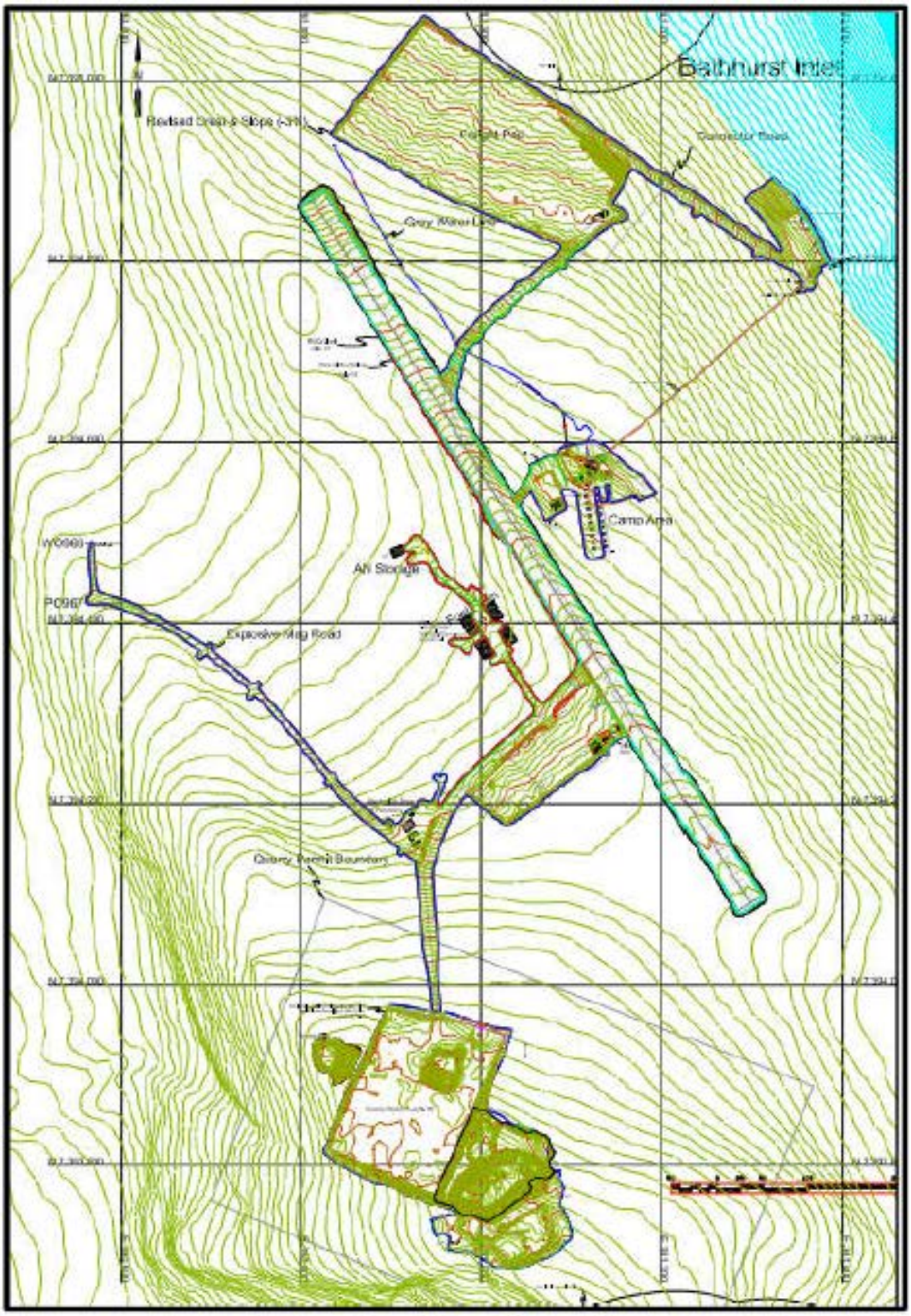


Figure 2.H-1. Marine Laydown Area Project Infrastructure Constructed in 2018

ii. Summary of 2018 construction activities at Goose Lake

Goose Lake development works activities included:

- Expansion of existing Airport Quarry;
- Construction of Quarry Access Road towards Echo Outflow including installation of two bridges for Gander Creek crossing; and
- Construction of Magazine Access Road.

Infrastructure completed at the MLA in 2018 is illustrated in Figure 2.H-2.

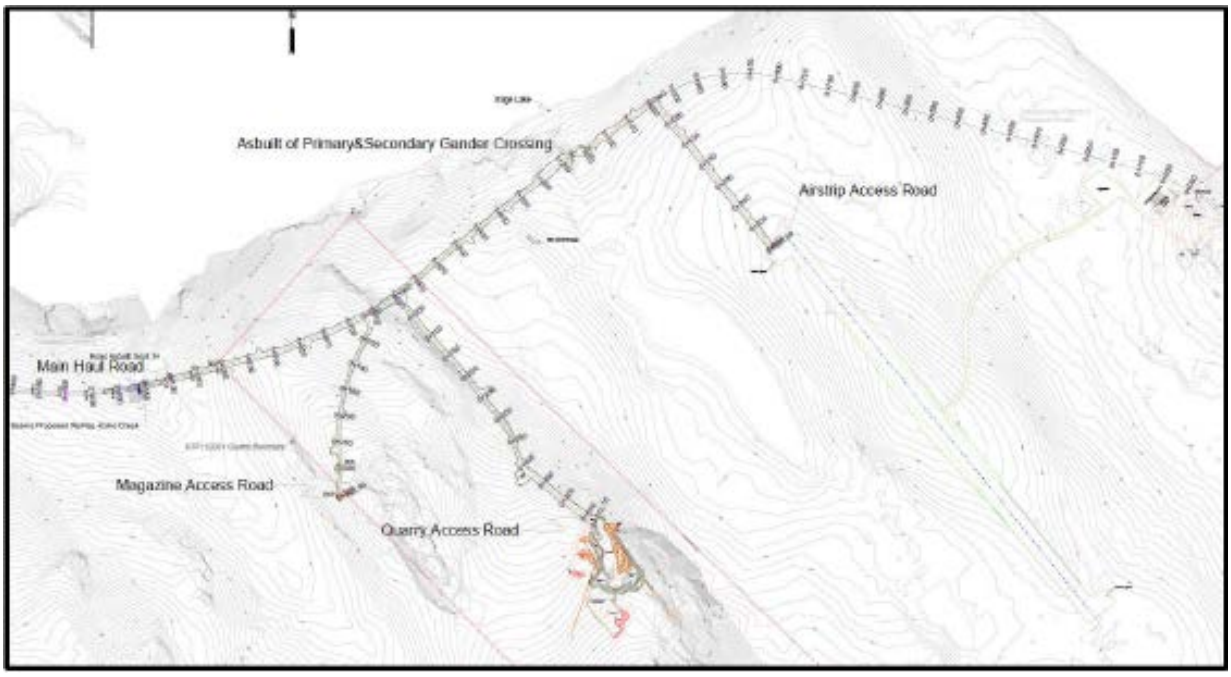


Figure 2.H-2. Goose Lake Project Infrastructure Constructed in 2018

iii. Activities planned at the MLA in 2019

Activities planned for 2019 are funding-dependant and may change. At present, 2019 activities at the MLA are expected to include:

- Open and operate the MLA in Q1;
- In winter, open operate MLA as a base to start the winter ice road construction;
  - Winter ice road construction and operation in Q1;
  - Haul equipment and supplies from MLA to Goose;
- Continue to operate MLA during summer to receive cargo via sealifts;
- Cargo storage at MLA freight storage area; and
- Temp closure of MLA in Q3 2019.

iv. Activities planned at the Goose Lake in 2019

Activities planned for 2019 are funding-dependant and may change. At present, 2019 activities at Goose Lake are expected to include:

- Receipt of equipment and supplies from MLA;
- Exploration activities;
- Commencement of earthworks including quarry expansion, initial road development and water crossing construction;
- Possible equipment upgrades;
- Initial earthworks at Goose Plant site; and
- Fuel Storage Area pad construction

I. CONTAINMENT STRUCTURE CONSTRUCTION AND PERFORMANCE

Temporary bulk fuel containment was erected at the MLA in 2018. It included twenty 30,000 L double-walled tanks brought in on the 2018 sealift which were placed in instaberms to provide tertiary containment. The MLA fuel storage facility can be seen in Figure 2.I-1. This facility successfully received a fuel offload in 2018. Water accumulating in the instaberms was discharged as outlined in Section 2.G of this report. As indicated in Section 2.G of this report, any snow accumulation in these berms will be removed prior to freshet.

There are no fuel containment structures relevant to this Licence at Goose Lake.



Figure 2.I-1. MLA Temporary Fuel Storage depot

J. RESTORATION LIABILITY UPDATE

An estimate of financial security for the pre-development works project was included with the Interim Closure and Reclamation Plan submitted to the NWB in July 2018. This estimate remained unchanged from that in the 2017 Interim Closure and Reclamation Plan. Full security required under the Licence and held by the Kitikmeot Inuit Association (including the additional contingency allowance specified by the

NWB) remains at $1,485,663. As noted in the Decision for Water Licence 2BC-BRP1819, the scope of this Licence will be incorporated into the Type "A" Licence once this Licence expires.

K. PUBLIC CONSULATATION/PARTICIPATION SUMMARY

The Back River Project Engagement Record is provided in Appendix C of this report.

L. EXECUTIVE SUMMARIES IN INUKTITUT AND ENGLISH

An executive summary of this report is provided in both English and Inuktitut at the start of this report. Executive summaries of the plans provided with this report are found within the individual plans attached as Appendices D through F.

M. BOARD REQUESTS ON WATER USE

No additional sampling or details on water use related to this Licence was requested by the Board or Inspector in 2018.

Appendix A NWB Annual Report Form

NWB Annual Report **Year being reported:** Select 2018

License No: 2BC-BRP1819 **Issued Date:** March 13, 2018
Expiry Date: April 30, 2019

Project Name: DEVELOPMENT WORKS, BACK RIVER PROJECT

Licensee: SABINA GOLD AND SILVER CORP

Mailing Address: #1800-555 Burrard St, Box 220, Vancouver, BC, V7X 1M9

Name of Company filing Annual Report (if different from Name of Licensee please clarify relationship between the two entities, if applicable):

SABINA GOLD AND SILVER CORP

General Background Information on the Project (*optional):

See Section 1 of attached report

Licence Requirements: the licensee must provide the following information in accodance with

Part B Select **4**

A summary report of water use and waste disposal activities, including, but not limited to: methods of obtaining water; sewage and greywater management; drill waste management; solid and hazardous waste management.

Water Source(s): Goose Lake, MLA Pond S1, MLA Pond S2

Water Quantity:

297	Quantity Allowable For All Uses (cu.m)
0	Actual Quantity Used (cu.m)
	water uses: dust suppression, compaction during construction and winter ice road construction

Waste Management and/or Disposal

- ☐ Solid Waste Disposal
- ☐ Sewage
- ☐ Drill Waste
- ☐ Greywater
- ☐ Hazardous
- ☐ Other:

Additional Details:

No wastes are deposisted under this Licence.

A list of unauthorized discharges and a summary of follow-up actions taken.

Spill No.: (as reported to the Spill Hot-line)
Date of Spill:
Date of Notification to an Inspector:
Additional Details: (impacts to water, mitigation measures, short/long term monitoring, etc)

Please see Section 2 D of Annual Report

Please see Section 2.D of Annual Report.

Revisions to the Spill Contingency Plan

Other: (see additional details)

Additional Details:

An updated SCP was provided to the NWB in July 2018 and is additionally appended to this Annual Report

Revisions to the Abandonment and Restoration Plan

Other: (see additional details)

Additional Details:

An updated Interim Closure and Reclamation Plan was provided to the NWB in July 2018 and is additionally appended to this Annual Report.

Progressive Reclamation Work Undertaken

Additional Details (i.e., work completed and future works proposed)

Please see Section 2.F of Annual Report.

Results of the Monitoring Program including:

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where sources of water are utilized;

Not Applicable (N/A)

Additional Details:

No water was used under this Licence in 2018.

The GPS Co-ordinates (in degrees, minutes and seconds of latitude and longitude) of each location where wastes associated with the licence are deposited;

Not Applicable (N/A)

Additional Details:

No waste was deposited under this Licence in 2018.

Results of any additional sampling and/or analysis that was requested by an Inspector

Additional sampling requested by an Inspector or the Board (See below)

Additional Details: (date of request, analysis of results, data attached, etc)

See Section 2.G of this report

Any other details on water use or waste disposal requested by the Board by November 1 of the year being reported.

No additional sampling requested by an Inspector or the Board

Additional Details: (Attached or provided below)

Any responses or follow-up actions on inspection/compliance reports

Inspection Report received by the Licensee (Date):

Additional Details: (Dates of Report, Follow-up by the Licensee)

Please see Section 2.G of Annual Report.

Any additional comments or information for the Board to consider

Date Submitted:	March 20 2018	
Submitted/Prepared by:	Katsky Venter	
Contact Information:	**Tel:**	
	Fax:	
	email:	mkeefe@sabinagoldsilver.com

Appendix B Water Quality Monitoring Results

SABINA GOLD & SILVER CORP.
ATTN: Merle Keefe / Mitchell Kearney
202 - 930 1st Street W
North Vancouver BC V7P 3N4

Date Received: 18-JUL-18
Report Date: 25-JUL-18 13:59 (MT)
Version: FINAL

Client Phone: 778-588-9782

Certificate of Analysis

Lab Work Order #: L2132090

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



Harman Bhullar
Account Manager

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2132090-1 EAST CAMP DRUMMED BERM							
Sampled By: MK on 17-JUL-18 @ 10:20							
Matrix: WATER							
BTX in water by headspace, GCMS							
BTEX, Styrene and F1 (C6-C10)							
Benzene	<0.00050		0.00050	mg/L	21-JUL-18	21-JUL-18	R4135934
Toluene	<0.00050		0.00050	mg/L	21-JUL-18	21-JUL-18	R4135934
EthylBenzene	<0.00050		0.00050	mg/L	21-JUL-18	21-JUL-18	R4135934
m+p-Xylene	<0.00050		0.00050	mg/L	21-JUL-18	21-JUL-18	R4135934
o-Xylene	<0.00050		0.00050	mg/L	21-JUL-18	21-JUL-18	R4135934
Xylenes	<0.00071		0.00071	mg/L	21-JUL-18	21-JUL-18	R4135934
Surrogate: 1,4-Difluorobenzene (SS)	101.8		70-130	%	21-JUL-18	21-JUL-18	R4135934
Surrogate: 4-Bromofluorobenzene (SS)	95.7		70-130	%	21-JUL-18	21-JUL-18	R4135934
Surrogate: 3,4-Dichlorotoluene (SS)	101.1		70-130	%	21-JUL-18	21-JUL-18	R4135934
Miscellaneous Parameters							
Oil and Grease	2.0		1.0	mg/L		25-JUL-18	R4139946
Phenols (4AAP)	0.0140		0.0010	mg/L		24-JUL-18	R4139130
pH	6.79		0.10	pH units		19-JUL-18	R4133660

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BTXS,F1-ED	Water	BTEX, Styrene and F1 (C6-C10)	EPA 5021/8015&8260 GC-MS & FID
OGG-LLE-GRAV-ED	Water	O&G by Hex/MTBE extraction, gravimetric	APHA 5520 B HEXANE MTBE EXT. GRAVIME
This technique employs a hexane/methyl-tert-butyl ether extraction of water, followed by filtration of the solvent into an evaporation container. The solvent is evaporated in a pre-weighed dish and the oil and grease content is calculated from the weight of material remaining.			
PH-MAN-YL	Water	pH by Manual Meter	APHA 4500-H B
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.			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.			

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

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

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
YL	ALS ENVIRONMENTAL -YELLOWKNIFE, NORTHWEST TERRITORIES CANADA

Chain of Custody Numbers:

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: SABINA GOLD & SILVER CORP.
202 - 930 1st Street W
North Vancouver BC V7P 3N4
Contact: Merle Keefe / Mitchell Kearney

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTXS,F1-ED	**Water**							
Batch R4135934								
WG2829122-4 DUP		**L2132090-1**						
Benzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	21-JUL-18
Toluene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	21-JUL-18
EthylBenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	21-JUL-18
m+p-Xylene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	21-JUL-18
o-Xylene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	21-JUL-18
WG2829122-2 LCS								
Benzene			86.2		%		70-130	21-JUL-18
Toluene			88.0		%		70-130	21-JUL-18
EthylBenzene			90.7		%		70-130	21-JUL-18
m+p-Xylene			90.0		%		70-130	21-JUL-18
o-Xylene			91.9		%		70-130	21-JUL-18
WG2829122-1 MB								
Benzene			<0.00050		mg/L		0.0005	21-JUL-18
Toluene			<0.00050		mg/L		0.0005	21-JUL-18
EthylBenzene			<0.00050		mg/L		0.0005	21-JUL-18
m+p-Xylene			<0.00050		mg/L		0.0005	21-JUL-18
o-Xylene			<0.00050		mg/L		0.0005	21-JUL-18
Surrogate: 1,4-Difluorobenzene (SS)			102.9		%		70-130	21-JUL-18
Surrogate: 4-Bromofluorobenzene (SS)			98.1		%		70-130	21-JUL-18
Surrogate: 3,4-Dichlorotoluene (SS)			98.9		%		70-130	21-JUL-18
OGG-LLE-GRAV-ED	**Water**							
Batch R4139946								
WG2831175-2 LCS								
Oil and Grease			88.0		%		70-130	25-JUL-18
WG2831175-1 MB								
Oil and Grease			<1.0		mg/L		1	25-JUL-18
PH-MAN-YL	**Water**							
Batch R4133660								
WG2827889-2 DUP		**L2132090-1**						
pH		6.79	6.79	J	pH units	0.00	0.3	19-JUL-18
WG2827889-1 LCS								
pH			5.99		pH units		5.8-6.2	19-JUL-18
PHENOLS-4AAP-WT	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PHENOLS-4AAP-WT	**Water**							
Batch R4139130								
WG2831059-3 DUP		**L2132090-1**						
Phenols (4AAP)		0.0140	0.0145		mg/L	3.7	20	24-JUL-18
WG2831059-2 LCS								
Phenols (4AAP)			104.3		%		85-115	24-JUL-18
WG2831059-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	24-JUL-18
WG2831059-4 MS		**L2132090-1**						
Phenols (4AAP)			101.3		%		75-125	24-JUL-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.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Quality Control Report

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH by Manual Meter							
	1	17-JUL-18 10:20	19-JUL-18 00:00	24	38	hours	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 L2132090 were received on 18-JUL-18 13:00.

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 Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # _____

Page 1 of 1

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Sabina Gold and Silver Corp.	☑ Standard ☐ Other	○ Regular (Standard Turnaround Times - Business Days)
Contact:	Merle Keefe / Mitchell Kearney	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1800-555 Burrard St., Box 220, Vancouver, BC, V7X 1M7	Email 1: mkearney@sabinagoldsilver.com	◉ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	mkeefe@sabinagoldsilver.com	Email 2: mkeefe@sabinagoldsilver.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	604-240-6619 Fax:	Email 3:	
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #:	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Sabina Gold and Silver Corp.	PO / AFE:	
Contact:	Accounts Payable	LSD:	
Address:	1800-555 Burrard St., Box 220, Vancouver, BC, V7X 1M7		
Phone:	604-998-4175 Fax:	Quote #:	
Lab Work Order # (lab use only)	L2132090	ALS Contact: Harman Bhullar	Sampler: Mitchell Kearney

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	pH	BTEX	Phenols	Oil & Grease								Number of Containers
	East Camp Drummed Berm	17-07-18	10:20	Water	X	X	X	X								6

L2132090-COFC

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC C… …s Details

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 provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Mitchell Kearney	17-07-2018	12:00	Tianli Liu	July 18th 2018	13:00	14.6 °C				

GENF 20.00 Front

SABINA GOLD & SILVER CORP.
ATTN: MERLE KEEFE/MITCHELL KEARNEY
1800-555 BURRARD ST.
BOX 220
Vancouver BC V7X 1M7

Date Received: 07-SEP-18
Report Date: 10-SEP-18 16:04 (MT)
Version: FINAL

Client Phone: 604-240-6619

Certificate of Analysis

Lab Work Order #: L2160213

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

Rick Zolkiewski
General Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Grouping	Analyte	L2160213-1 WATER 06-SEP-18 WEST BULK BERM	L2160213-2 WATER 06-SEP-18 BULK BERM 1	L2160213-3 WATER 06-SEP-18 BULK BERM 2	L2160213-4 WATER 06-SEP-18 BULK BERM 3	L2160213-5 WATER 06-SEP-18 BULK BERM 5
Sample ID		L2160213-1	L2160213-2	L2160213-3	L2160213-4	L2160213-5
Description		WATER	WATER	WATER	WATER	WATER
Sampled Date		06-SEP-18	06-SEP-18	06-SEP-18	06-SEP-18	06-SEP-18
Sampled Time						
Client ID		WEST BULK BERM	BULK BERM 1	BULK BERM 2	BULK BERM 3	BULK BERM 5
WATER						
Physical Tests	pH (pH units)	8.10	5.79	5.51	6.19	6.37
	Total Suspended Solids (mg/L)	4.2	<3.0	<3.0	<3.0	7.2
Total Metals	Lead (Pb)-Total (mg/L)	0.000362	0.000146	<0.000050	0.000144	0.000199

ALS ENVIRONMENTAL ANALYTICAL REPORT

	Sample ID	L2160213-6	L2160213-7	L2160213-8		
	Description	WATER	WATER	WATER		
	Sampled Date	06-SEP-18	06-SEP-18	06-SEP-18		
	Sampled Time					
	Client ID	BULK BERM 6	BULK BERM 7	BULK BERM 8		
Grouping	**Analyte**					
WATER						
Physical Tests	pH (pH units)	5.68	5.56	6.10		
	Total Suspended Solids (mg/L)	<3.0	4.0	4.0		
Total Metals	Lead (Pb)-Total (mg/L)	0.000120	0.000450	0.000094		

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
EC-SCREEN-VA	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
MET-T-CCMS-VA	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
PH-MAN-YL	Water	pH by Manual Meter	APHA 4500-H B
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.			
TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC
This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.			

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

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

Laboratory Definition Code	Laboratory Location
YL	ALS ENVIRONMENTAL -YELLOWKNIFE, NORTHWEST TERRITORIES CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

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

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

Quality Control Report

Workorder: L2160213 Report Date: 10-SEP-18

Client: SABINA GOLD & SILVER CORP.
1800-555 BURRARD ST. BOX 220
Vancouver BC V7X 1M7
Contact: MERLE KEEFE/MITCHELL KEARNEY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-VA	**Water**							
Batch R4206628								
WG2871766-3 DUP		**L2160213-2**						
Lead (Pb)-Total		0.000146	0.000143		mg/L	1.9	20	09-SEP-18
WG2871766-2 LCS								
Lead (Pb)-Total			97.0		%		80-120	09-SEP-18
WG2871766-1 MB								
Lead (Pb)-Total			<0.000050		mg/L		0.00005	09-SEP-18
WG2871766-4 MS		**L2160213-1**						
Lead (Pb)-Total			88.5		%		70-130	09-SEP-18
PH-MAN-YL	**Water**							
Batch R4204838								
WG2870596-2 DUP		**L2160213-7**						
pH		5.56	5.57	J	pH units	0.00	0.3	07-SEP-18
WG2870596-1 LCS								
pH			5.97		pH units		5.8-6.2	07-SEP-18
TSS-VA	**Water**							
Batch R4206787								
WG2871525-2 LCS								
Total Suspended Solids			108.0		%		85-115	08-SEP-18
WG2871525-1 MB								
Total Suspended Solids			<3.0		mg/L		3	08-SEP-18

Quality Control Report

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.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # _____

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Sabina Gold and Silver Corp.	☑ Standard ☐ Other	○ Regular (Standard Turnaround Times - Business Days)
Contact:	Merle Keefe / Mitchell Kearney	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1800-555 Burrard St., Box 220, Vancouver, BC, V7X 1M7	Email 1: mkearney@sabinagoldsilver.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	mkeefe@sabinagoldsilver.com	Email 2: mkeefe@sabinagoldsilver.com	◉ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	604-240-6619 Fax:	Email 3:	
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #:	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Sabina Gold and Silver Corp.	PO / AFE:	
Contact:	Accounts Payable	LSD:	
Address:	1800-555 Burrard St., Box 220, Vancouver, BC, V7X 1M7		
Phone:	604-998-4175 Fax:	Quote #: Q45187	
Lab Work Order # (lab use only)	L2160213	ALS Contact: Rick Zolkiewski	Sampler:

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	pH	Lead	TSS	Oil & Grease	Number of Containers
1	West Bulk Berm	06-Sep-18		Water	X	X	X		1
2	Bulk Berm 1	06-Sep-18		Water	X	X	X		1
3	Bulk Berm 2	06-Sep-18		Water	X	X	X		1
4	Bulk Berm 3	06-Sep-18		Water	X	X	X		1
5	Bulk Berm 5	06-Sep-18		Water	X	X	X		1
6	Bulk Berm 6	06-Sep-18		Water	X	X	X		1
7	Bulk Berm 7	06-Sep-18		Water	X	X	X		1
8	Bulk Berm 8	06-Sep-18		Water	X	X	X		1

L2160213-COFC

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

* NOT PRESERVED *

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 provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
				7/9	9:20	6.6 °C				

SABINA GOLD & SILVER CORP.
ATTN: Merle Keefe/Mitchell Kearney
1800-555 Burrard St
Box 220, Bentall 2
Vancouver BC V7X 1M7

Date Received: 29-AUG-18
Report Date: 05-SEP-18 11:43 (MT)
Version: FINAL

Client Phone: 604-998-4175

Certificate of Analysis

Lab Work Order #: L2154896

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

Comments:

31-AUG-2018 Prelim Rush Results

Rick Zolkiewski
General Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2154896-1 WEST BULK BERM							
Sampled By: MITCHELL KEARNEY on 28-AUG-18 @ 08:00							
Matrix: WATER							
BETX+MTBE in Water by Headspace GCMS							
BTEX/MTBE/Styrene by Headspace GCMS							
Benzene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Ethylbenzene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Methyl t-butyl ether (MTBE)	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Styrene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Toluene	<0.00045		0.00045	mg/L	30-AUG-18	30-AUG-18	R4175705
meta- & para-Xylene	0.00060		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
ortho-Xylene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Sum of Xylene Isomer Concentrations							
Xylenes	<0.00075		0.00075	mg/L		31-AUG-18	
VOC7 and/or VOC Surrogates for Waters							
Surrogate: 1,4-Difluorobenzene (SS)	100.5		70-130	%		30-AUG-18	R4175705
Surrogate: 4-Bromofluorobenzene (SS)	99.0		70-130	%		30-AUG-18	R4175705
Miscellaneous Parameters							
Oil and Grease	<5.0		5.0	mg/L		30-AUG-18	R4195826
Phenols (4AAP)	0.0116		0.0010	mg/L		04-SEP-18	R4201700
pH	5.34		0.10	pH units		29-AUG-18	R4191911
L2154896-2 BULK BERM 1							
Sampled By: MITCHELL KEARNEY on 28-AUG-18 @ 08:00							
Matrix: WATER							
BETX+MTBE in Water by Headspace GCMS							
BTEX/MTBE/Styrene by Headspace GCMS							
Benzene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Ethylbenzene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Methyl t-butyl ether (MTBE)	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Styrene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Toluene	<0.00045		0.00045	mg/L	30-AUG-18	30-AUG-18	R4175705
meta- & para-Xylene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
ortho-Xylene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Sum of Xylene Isomer Concentrations							
Xylenes	<0.00075		0.00075	mg/L		31-AUG-18	
VOC7 and/or VOC Surrogates for Waters							
Surrogate: 1,4-Difluorobenzene (SS)	99.5		70-130	%		30-AUG-18	R4175705
Surrogate: 4-Bromofluorobenzene (SS)	96.5		70-130	%		30-AUG-18	R4175705
Miscellaneous Parameters							
Oil and Grease	6.7		5.0	mg/L		30-AUG-18	R4195826
Phenols (4AAP)	0.0258		0.0010	mg/L		04-SEP-18	R4201700
pH	5.84		0.10	pH units		29-AUG-18	R4191911
L2154896-3 BULK BERM 2							
Sampled By: MITCHELL KEARNEY on 28-AUG-18 @ 08:00							
Matrix: WATER							
BETX+MTBE in Water by Headspace GCMS							
BTEX/MTBE/Styrene by Headspace GCMS							
Benzene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Ethylbenzene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Methyl t-butyl ether (MTBE)	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Styrene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Toluene	<0.00045		0.00045	mg/L	30-AUG-18	30-AUG-18	R4175705
meta- & para-Xylene	0.00106		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
ortho-Xylene	0.00131		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Sum of Xylene Isomer Concentrations							

* 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
L2154896-3 BULK BERM 2							
Sampled By: MITCHELL KEARNEY on 28-AUG-18 @ 08:00							
Matrix: WATER							
Sum of Xylene Isomer Concentrations							
Xylenes	0.00236		0.00075	mg/L		31-AUG-18	
VOC7 and/or VOC Surrogates for Waters							
Surrogate: 1,4-Difluorobenzene (SS)	100.2		70-130	%		30-AUG-18	R4175705
Surrogate: 4-Bromofluorobenzene (SS)	97.6		70-130	%		30-AUG-18	R4175705
Miscellaneous Parameters							
Oil and Grease	<5.0		5.0	mg/L		30-AUG-18	R4195826
Phenols (4AAP)	0.0268		0.0010	mg/L		04-SEP-18	R4201700
pH	5.40		0.10	pH units		29-AUG-18	R4191911
L2154896-4 BULK BERM 3							
Sampled By: MITCHELL KEARNEY on 28-AUG-18 @ 08:00							
Matrix: WATER							
BETX+MTBE in Water by Headspace GCMS							
BTEX/MTBE/Styrene by Headspace GCMS							
Benzene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Ethylbenzene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Methyl t-butyl ether (MTBE)	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Styrene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Toluene	<0.00045		0.00045	mg/L	30-AUG-18	30-AUG-18	R4175705
meta- & para-Xylene	0.00160		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
ortho-Xylene	0.00076		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Sum of Xylene Isomer Concentrations							
Xylenes	0.00236		0.00075	mg/L		31-AUG-18	
VOC7 and/or VOC Surrogates for Waters							
Surrogate: 1,4-Difluorobenzene (SS)	99.1		70-130	%		30-AUG-18	R4175705
Surrogate: 4-Bromofluorobenzene (SS)	95.0		70-130	%		30-AUG-18	R4175705
Miscellaneous Parameters							
Oil and Grease	<5.0		5.0	mg/L		30-AUG-18	R4195826
Phenols (4AAP)	0.0214		0.0010	mg/L		04-SEP-18	R4201700
pH	6.21		0.10	pH units		29-AUG-18	R4191911
L2154896-5 BULK BERM 5							
Sampled By: MITCHELL KEARNEY on 28-AUG-18 @ 08:00							
Matrix: WATER							
BETX+MTBE in Water by Headspace GCMS							
BTEX/MTBE/Styrene by Headspace GCMS							
Benzene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Ethylbenzene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Methyl t-butyl ether (MTBE)	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Styrene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Toluene	<0.00045		0.00045	mg/L	30-AUG-18	30-AUG-18	R4175705
meta- & para-Xylene	0.00068		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
ortho-Xylene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Sum of Xylene Isomer Concentrations							
Xylenes	<0.00075		0.00075	mg/L		31-AUG-18	
VOC7 and/or VOC Surrogates for Waters							
Surrogate: 1,4-Difluorobenzene (SS)	100.6		70-130	%		30-AUG-18	R4175705
Surrogate: 4-Bromofluorobenzene (SS)	94.8		70-130	%		30-AUG-18	R4175705
Miscellaneous Parameters							
Oil and Grease	<5.0		5.0	mg/L		30-AUG-18	R4195826
Phenols (4AAP)	6.9	DLHC	1.0	mg/L		04-SEP-18	R4201700
pH	5.61		0.10	pH units		29-AUG-18	R4191911

* 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
L2154896-5 BULK BERM 5							
Sampled By: MITCHELL KEARNEY on 28-AUG-18 @ 08:00							
Matrix: WATER							
L2154896-6 BULK BERM 6							
Sampled By: MITCHELL KEARNEY on 28-AUG-18 @ 08:00							
Matrix: WATER							
BETX+MTBE in Water by Headspace GCMS							
BTEX/MTBE/Styrene by Headspace GCMS							
Benzene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Ethylbenzene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Methyl t-butyl ether (MTBE)	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Styrene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Toluene	<0.00045		0.00045	mg/L	30-AUG-18	30-AUG-18	R4175705
meta- & para-Xylene	0.00111		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
ortho-Xylene	0.00051		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Sum of Xylene Isomer Concentrations							
Xylenes	0.00161		0.00075	mg/L		31-AUG-18	
VOC7 and/or VOC Surrogates for Waters							
Surrogate: 1,4-Difluorobenzene (SS)	96.1		70-130	%		30-AUG-18	R4175705
Surrogate: 4-Bromofluorobenzene (SS)	95.6		70-130	%		30-AUG-18	R4175705
Miscellaneous Parameters							
Oil and Grease	<5.0		5.0	mg/L		30-AUG-18	R4195826
Phenols (4AAP)	0.0138		0.0010	mg/L		04-SEP-18	R4201700
pH	5.72		0.10	pH units		29-AUG-18	R4191911
L2154896-7 BULK BERM 7							
Sampled By: MITCHELL KEARNEY on 28-AUG-18 @ 08:00							
Matrix: WATER							
BETX+MTBE in Water by Headspace GCMS							
BTEX/MTBE/Styrene by Headspace GCMS							
Benzene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Ethylbenzene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Methyl t-butyl ether (MTBE)	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Styrene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Toluene	<0.00045		0.00045	mg/L	30-AUG-18	30-AUG-18	R4175705
meta- & para-Xylene	0.00078		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
ortho-Xylene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Sum of Xylene Isomer Concentrations							
Xylenes	0.00078		0.00075	mg/L		31-AUG-18	
VOC7 and/or VOC Surrogates for Waters							
Surrogate: 1,4-Difluorobenzene (SS)	101.8		70-130	%		30-AUG-18	R4175705
Surrogate: 4-Bromofluorobenzene (SS)	93.9		70-130	%		30-AUG-18	R4175705
Miscellaneous Parameters							
Oil and Grease	6.4		5.0	mg/L		30-AUG-18	R4195826
Phenols (4AAP)	1.8	DLHC	1.0	mg/L		04-SEP-18	R4201700
pH	4.91		0.10	pH units		29-AUG-18	R4191911
L2154896-8 BULK BERM 8							
Sampled By: MITCHELL KEARNEY on 28-AUG-18 @ 08:00							
Matrix: WATER							
BETX+MTBE in Water by Headspace GCMS							
BTEX/MTBE/Styrene by Headspace GCMS							
Benzene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Ethylbenzene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Methyl t-butyl ether (MTBE)	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Styrene	<0.00050		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705

* 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
L2154896-8 BULK BERM 8							
Sampled By: MITCHELL KEARNEY on 28-AUG-18 @ 08:00							
Matrix: WATER							
BTEX/MTBE/Styrene by Headspace GCMS							
Toluene	<0.00045		0.00045	mg/L	30-AUG-18	30-AUG-18	R4175705
meta- & para-Xylene	0.00138		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
ortho-Xylene	0.00057		0.00050	mg/L	30-AUG-18	30-AUG-18	R4175705
Sum of Xylene Isomer Concentrations							
Xylenes	0.00195		0.00075	mg/L		31-AUG-18	
VOC7 and/or VOC Surrogates for Waters							
Surrogate: 1,4-Difluorobenzene (SS)	100.2		70-130	%		30-AUG-18	R4175705
Surrogate: 4-Bromofluorobenzene (SS)	97.2		70-130	%		30-AUG-18	R4175705
Miscellaneous Parameters							
Oil and Grease	<5.0		5.0	mg/L		30-AUG-18	R4195826
Phenols (4AAP)	0.0095		0.0010	mg/L		04-SEP-18	R4201700
pH	5.57		0.10	pH units		29-AUG-18	R4191911

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
OGG-SF-VA	Water	Oil & Grease by Gravimetric	BCMOE (2010), EPA1664A
The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease.			
PH-MAN-YL	Water	pH by Manual Meter	APHA 4500-H B
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.			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.			
VOC7-HSMS-VA	Water	BTEX/MTBE/Styrene by Headspace GCMS	EPA 5021A/8260C
The water sample, with added reagents, is heated in a sealed vial to equilibrium. The headspace from the vial is transfered into a gas chromatograph. Target compound concentrations are measured using mass spectrometry detection.			
VOC7/VOC-SURR-MS-VA	Water	VOC7 and/or VOC Surrogates for Waters	EPA 5035A/5021A/8260C
XYLENES-CALC-VA	Water	Sum of Xylene Isomer Concentrations	CALCULATION
Calculation of Total Xylenes			
Total Xylenes is the sum of the concentrations of the ortho, meta, and para Xylene isomers. Results below detection limit (DL) are treated as zero. The DL for Total Xylenes is set to a value no less than the square root of the sum of the squares of the DLs of the individual Xylenes.			

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

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

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

Chain of Custody Numbers:

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

Workorder: L2154896 Report Date: 05-SEP-18

Client: SABINA GOLD & SILVER CORP.
1800-555 Burrard St Box 220, Bentall 2
Vancouver BC V7X 1M7
Contact: Merle Keefe/Mitchell Kearney

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
OGG-SF-VA	**Water**							
Batch R4195826								
WG2864794-2 LCS								
Oil and Grease			98.6		%		70-130	30-AUG-18
WG2864794-1 MB								
Oil and Grease			<5.0		mg/L		5	30-AUG-18
PH-MAN-YL	**Water**							
Batch R4191911								
WG2863173-2 DUP		**L2154896-6**						
pH		5.72	5.69	J	pH units	0.03	0.3	29-AUG-18
WG2863173-1 LCS								
pH			5.99		pH units		5.8-6.2	29-AUG-18
PHENOLS-4AAP-WT	**Water**							
Batch R4201700								
WG2868142-3 DUP		**L2154896-1**						
Phenols (4AAP)		0.0116	0.0116		mg/L	0.1	20	04-SEP-18
WG2868142-2 LCS								
Phenols (4AAP)			113.5		%		85-115	04-SEP-18
WG2868142-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	04-SEP-18
WG2868142-4 MS		**L2154896-1**						
Phenols (4AAP)			87.4		%		75-125	04-SEP-18
VOC7-HSMS-VA	**Water**							
Batch R4175705								
WG2864675-3 DUP		**L2154896-8**						
Benzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	30-AUG-18
Ethylbenzene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	30-AUG-18
Methyl t-butyl ether (MTBE)		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	30-AUG-18
Styrene		<0.00050	<0.00050	RPD-NA	mg/L	N/A	30	30-AUG-18
Toluene		<0.00045	<0.00045	RPD-NA	mg/L	N/A	30	30-AUG-18
meta- & para-Xylene		0.00138	0.00139		mg/L	0.9	30	30-AUG-18
ortho-Xylene		0.00057	0.00053		mg/L	6.9	30	30-AUG-18
WG2864675-2 LCS								
Benzene			104.1		%		70-130	30-AUG-18
Ethylbenzene			98.0		%		70-130	30-AUG-18
Methyl t-butyl ether (MTBE)			102.7		%		70-130	30-AUG-18
Styrene			114.4		%		70-130	30-AUG-18
Toluene			93.6		%		70-130	30-AUG-18
meta- & para-Xylene			109.4		%		70-130	30-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC7-HSMS-VA	**Water**							
Batch R4175705								
WG2864675-2 LCS								
ortho-Xylene			110.6		%		70-130	30-AUG-18
WG2864675-1 MB								
Benzene			<0.00050		mg/L		0.0005	30-AUG-18
Ethylbenzene			<0.00050		mg/L		0.0005	30-AUG-18
Methyl t-butyl ether (MTBE)			<0.00050		mg/L		0.0005	30-AUG-18
Styrene			<0.00050		mg/L		0.0005	30-AUG-18
Toluene			<0.00045		mg/L		0.00045	30-AUG-18
meta- & para-Xylene			<0.00050		mg/L		0.0005	30-AUG-18
ortho-Xylene			<0.00050		mg/L		0.0005	30-AUG-18

Quality Control Report

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.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

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

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC # _____

Page 1 of 1

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Sabina Gold and Silver Corp.	☑ Standard ☐ Other	○ Regular (Standard Turnaround Times - Business Days)
Contact:	Merle Keefe / Mitchell Kearney	☑ PDF ☑ Excel ☐ Digital ☐ Fax	○ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1800-555 Burrard St., Box 220, Vancouver, BC, V7X 1M7	Email 1: mkearney@sabinagoldsilver.com	◉ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	mkeefe@sabinagoldsilver.com	Email 2: mkeefe@sabinagoldsilver.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	604-240-6619 Fax:	Email 3:	
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #:	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Sabina Gold and Silver Corp.	PO / AFE:	
Contact:	Accounts Payable	LSD:	
Address:	1800-555 Burrard St., Box 220, Vancouver, BC, V7X 1M7		
Phone:	604-998-4175 Fax:	Quote #:	
Lab Work Order # (lab use only)		ALS Contact: Rick Zolkiewski	Sampler: Mitchell Kearney

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	pH	BTEX	Phenols	Oil & Grease								Number of Containers
1	West Bulk Berm	28-08-18	8:00	Water	X	X	X	X								6
2	Bulk Berm 1	28-08-18	8:00	Water	X	X	X	X								6
3	Bulk Berm 2	28-08-18	8:00	Water	X	X	X	X								6
4	Bulk Berm 3	28-08-18	8:00	Water	X	X	X	X								6
5	Bulk Berm 5	28-08-18	8:00	Water	X	X	X	X								6
6	Bulk Berm 6	28-08-18	8:00	Water	X	X	X	X								6
7	Bulk Berm 7	28-08-18	8:00	Water	X	X	X	X								6
8	Bulk Berm 8	28-08-18	8:00	Water	X	X	X	X								6

L2154896-COFC

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

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 provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Mitchell Kearney	28-08-2018	12:00		Aug 29/18	0920	9.8 °C				

GENF 20.00 Front

A/C 19597

SABINA GOLD & SILVER CORP.
ATTN: MERLE KEEFE/MITCHELL KEARNEY
Suite 1800- 555 Burrard St.
Box 220
Vancouver BC V7X 1M7

Date Received: 19-SEP-18
Report Date: 25-SEP-18 15:13 (MT)
Version: FINAL

Client Phone: 604-240-6619

Certificate of Analysis

Lab Work Order #: L2166897

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

Rick Zolkiewski
General Manager

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

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2166897-1 BULK BERM 1							
Sampled By: MITCHELL KEARNEY on 18-SEP-18 @ 11:00							
Matrix: WATER							
BETX+MTBE in Water by Headspace GCMS							
BTEX/MTBE/Styrene by Headspace GCMS							
Benzene	<0.00050		0.00050	mg/L	22-SEP-18	22-SEP-18	R4234950
Ethylbenzene	<0.00050		0.00050	mg/L	22-SEP-18	22-SEP-18	R4234950
Methyl t-butyl ether (MTBE)	<0.00050		0.00050	mg/L	22-SEP-18	22-SEP-18	R4234950
Styrene	<0.00050		0.00050	mg/L	22-SEP-18	22-SEP-18	R4234950
Toluene	0.00089		0.00045	mg/L	22-SEP-18	22-SEP-18	R4234950
meta- & para-Xylene	0.00073		0.00050	mg/L	22-SEP-18	22-SEP-18	R4234950
ortho-Xylene	<0.00050		0.00050	mg/L	22-SEP-18	22-SEP-18	R4234950
Sum of Xylene Isomer Concentrations							
Xylenes	<0.00075		0.00075	mg/L		24-SEP-18	
VOC7 and/or VOC Surrogates for Waters							
Surrogate: 1,4-Difluorobenzene (SS)	104.9		70-130	%		22-SEP-18	R4234950
Surrogate: 4-Bromofluorobenzene (SS)	100.9		70-130	%		22-SEP-18	R4234950
Miscellaneous Parameters							
Oil and Grease	<5.0		5.0	mg/L		23-SEP-18	R4235873
Phenols (4AAP)	0.568	DLM	0.020	mg/L		24-SEP-18	R4239287
pH	6.39		0.10	pH		22-SEP-18	R4233652
L2166897-2 BULK BERM 7							
Sampled By: MITCHELL KEARNEY on 18-SEP-18 @ 11:00							
Matrix: WATER							
BETX+MTBE in Water by Headspace GCMS							
BTEX/MTBE/Styrene by Headspace GCMS							
Benzene	<0.00050		0.00050	mg/L	22-SEP-18	25-SEP-18	R4234950
Ethylbenzene	<0.00050		0.00050	mg/L	22-SEP-18	25-SEP-18	R4234950
Methyl t-butyl ether (MTBE)	<0.00050		0.00050	mg/L	22-SEP-18	25-SEP-18	R4234950
Styrene	<0.00050		0.00050	mg/L	22-SEP-18	25-SEP-18	R4234950
Toluene	<0.00045		0.00045	mg/L	22-SEP-18	25-SEP-18	R4234950
meta- & para-Xylene	<0.00050		0.00050	mg/L	22-SEP-18	25-SEP-18	R4234950
ortho-Xylene	<0.00050		0.00050	mg/L	22-SEP-18	25-SEP-18	R4234950
Sum of Xylene Isomer Concentrations							
Xylenes	<0.00075		0.00075	mg/L		25-SEP-18	
VOC7 and/or VOC Surrogates for Waters							
Surrogate: 1,4-Difluorobenzene (SS)	102.3		70-130	%		25-SEP-18	R4234950
Surrogate: 4-Bromofluorobenzene (SS)	98.0		70-130	%		25-SEP-18	R4234950
Miscellaneous Parameters							
Oil and Grease	<5.0		5.0	mg/L		23-SEP-18	R4235873
Phenols (4AAP)	0.653	DLM	0.020	mg/L		24-SEP-18	R4239287
pH	6.44		0.10	pH		22-SEP-18	R4233652

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
EC-SCREEN-VA	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
OGG-SF-VA	Water	Oil & Grease by Gravimetric	BCMOE (2010), EPA1664A
The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode It is recommended that this analysis be conducted in the field.			
PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.			
VOC7-HSMS-VA	Water	BTEX/MTBE/Styrene by Headspace GCMS	EPA 5021A/8260C
The water sample, with added reagents, is heated in a sealed vial to equilibrium. The headspace from the vial is transfered into a gas chromatograph. Target compound concentrations are measured using mass spectrometry detection.			
VOC7/VOC-SURR-MS-VA	Water	VOC7 and/or VOC Surrogates for Waters	EPA 5035A/5021A/8260C
XYLENES-CALC-VA	Water	Sum of Xylene Isomer Concentrations	CALCULATION
Calculation of Total Xylenes Total Xylenes is the sum of the concentrations of the ortho, meta, and para Xylene isomers. Results below detection limit (DL) are treated as zero. The DL for Total Xylenes is set to a value no less than the square root of the sum of the squares of the DLs of the individual Xylenes.			

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

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

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

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

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: SABINA GOLD & SILVER CORP.
Suite 1800- 555 Burrard St. Box 220
Vancouver BC V7X 1M7
Contact: MERLE KEEFE/MITCHELL KEARNEY

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
OGG-SF-VA	**Water**							
Batch R4235873								
WG2884344-2 LCS								
Oil and Grease			104.4		%		70-130	23-SEP-18
WG2884344-1 MB								
Oil and Grease			<5.0		mg/L		5	23-SEP-18
PH-PCT-VA	**Water**							
Batch R4233652								
WG2883931-2 CRM		**VA-PH7-BUF**						
pH			7.01		pH		6.9-7.1	22-SEP-18
WG2883931-5 DUP		**L2166897-1**						
pH		6.39	6.39	J	pH	0.00	0.3	22-SEP-18
PHENOLS-4AAP-WT	**Water**							
Batch R4239287								
WG2885358-2 LCS								
Phenols (4AAP)			106.3		%		85-115	24-SEP-18
WG2885358-1 MB								
Phenols (4AAP)			<0.0010		mg/L		0.001	24-SEP-18
VOC7-HSMS-VA	**Water**							
Batch R4234950								
WG2883982-2 LCS								
Benzene			107.8		%		70-130	22-SEP-18
Ethylbenzene			93.5		%		70-130	22-SEP-18
Methyl t-butyl ether (MTBE)			129.8		%		70-130	22-SEP-18
Styrene			99.9		%		70-130	22-SEP-18
Toluene			110.4		%		70-130	22-SEP-18
meta- & para-Xylene			104.8		%		70-130	22-SEP-18
ortho-Xylene			104.6		%		70-130	22-SEP-18
WG2883982-1 MB								
Benzene			<0.00050		mg/L		0.0005	22-SEP-18
Ethylbenzene			<0.00050		mg/L		0.0005	22-SEP-18
Methyl t-butyl ether (MTBE)			<0.00050		mg/L		0.0005	22-SEP-18
Styrene			<0.00050		mg/L		0.0005	22-SEP-18
Toluene			<0.00045		mg/L		0.00045	22-SEP-18
meta- & para-Xylene			<0.00050		mg/L		0.0005	22-SEP-18
ortho-Xylene			<0.00050		mg/L		0.0005	22-SEP-18

Quality Control Report

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.

Quality Control Report

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
pH by Meter (Automated)							
	1	18-SEP-18 11:00	22-SEP-18 13:22	0.25	98	hours	EHTR-FM
	2	18-SEP-18 11:00	22-SEP-18 13:22	0.25	98	hours	EHTR-FM

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 L2166897 were received on 19-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 Environmental

Chain of Custody / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

A/C 19597

COC # _____

Page 1 of 1

Report To		Report Format / Distribution	Service Requested (Rush for routine analysis subject to availability)
Company:	Sabina Gold and Silver Corp.	☑ Standard ☐ Other	○ Regular (Standard Turnaround Times - Business Days)
Contact:	Merle Keefe / Mitchell Kearney	☑ PDF ☑ Excel ☐ Digital ☐ Fax	◉ Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT
Address:	1800-555 Burrard St., Box 220, Vancouver, BC, V7X 1M7	Email 1: mkearney@sabinagoldsilver.com	○ Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT
	mkeefe@sabinagoldsilver.com	Email 2: mkeefe@sabinagoldsilver.com	○ Same Day or Weekend Emergency - Contact ALS to Confirm TAT
Phone:	604-240-6619 Fax:	Email 3:	
Invoice To	Same as Report ? ☐ Yes ☑ No	Client / Project Information	Analysis Request
Hardcopy of Invoice with Report?	☑ Yes ☐ No	Job #:	Please indicate below Filtered, Preserved or both (F, P, F/P)
Company:	Sabina Gold and Silver Corp.	PO / AFE:	
Contact:	Accounts Payable	LSD:	
Address:	1800-555 Burrard St., Box 220, Vancouver, BC, V7X 1M7		
Phone:	604-998-4175 Fax:	Quote #:	

Lab Work Order # (lab use only): L2166897

ALS Contact: Rick Zolkiewski

Sampler: Mitchell Kearney

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	pH	BTEX	Phenols	Oil & Grease	Number of Containers
	Bulk Berm 1	18-Sep-18	11:00	Water	X	X	X	X	6
	Bulk Berm 7	18-Sep-18	11:00	Water	X	X	X	X	6

L2166897-COFC

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Note that pH was measured in the field. BB1: pH=7.52, BB7: pH=7.30

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 provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Mitchell Kearney	18-09-18	13:00		19 Sep	9:00	3.9 °C				

[redacted]

GOLDER ASSOCIATES LTD
ATTN: Zenovia Craciunescu/Kerrie serben
16820 107 Ave NW
EDMONTON AB T5P 4C3

Date Received: 15-JUN-18
Report Date: 06-SEP-18 11:33 (MT)
Version: FINAL REV. 2

Client Phone: 780-930-6786

Certificate of Analysis

Lab Work Order #: L2113424

Project P.O. #: NOT SUBMITTED
Job Reference: 1787890/2200/2240
C of C Numbers:
Legal Site Desc:

Comments: ADDITIONAL REPORT: L2113424-11 TOTAL DISSOLVED PHOSPHORUS CONFIRMED BY RECHECK REANALYSIS. L2113424-11 TOTAL PHOSPHORUS CONFIRMED BY RECHECK DATA REVIEW.

[redacted]

PL

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

[redacted]

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2113424-1 BRP-39A							
Sampled By: TH/MK on 11-JUN-18 @ 08:45							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	LAB					08-AUG-18	R4161111
Aluminum (Al)-Dissolved	0.00892		0.00030	mg/L		08-AUG-18	R4163587
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		08-AUG-18	R4163587
Arsenic (As)-Dissolved	0.000152		0.000020	mg/L		08-AUG-18	R4163587
Barium (Ba)-Dissolved	0.00412		0.000050	mg/L		08-AUG-18	R4163587
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Boron (B)-Dissolved	0.0012		0.0010	mg/L		08-AUG-18	R4163587
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Calcium (Ca)-Dissolved	1.78		0.020	mg/L		08-AUG-18	R4163587
Chromium (Cr)-Dissolved	0.000061		0.000060	mg/L		08-AUG-18	R4163587
Cobalt (Co)-Dissolved	0.000281		0.000010	mg/L		08-AUG-18	R4163587
Copper (Cu)-Dissolved	0.00076	DTC	0.00010	mg/L		08-AUG-18	R4163587
Iron (Fe)-Dissolved	0.0205		0.0010	mg/L		08-AUG-18	R4163587
Lead (Pb)-Dissolved	0.000017		0.000010	mg/L		08-AUG-18	R4163587
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		08-AUG-18	R4163587
Magnesium (Mg)-Dissolved	1.42		0.0040	mg/L		08-AUG-18	R4163587
Manganese (Mn)-Dissolved	0.0177		0.000050	mg/L		08-AUG-18	R4163587
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Nickel (Ni)-Dissolved	0.00158		0.000060	mg/L		08-AUG-18	R4163587
Potassium (K)-Dissolved	0.362		0.020	mg/L		08-AUG-18	R4163587
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		08-AUG-18	R4163587
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Sodium (Na)-Dissolved	0.608		0.0050	mg/L		08-AUG-18	R4163587
Strontium (Sr)-Dissolved	0.00657		0.000050	mg/L		08-AUG-18	R4163587
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		08-AUG-18	R4163587
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Zinc (Zn)-Dissolved	0.00160		0.00080	mg/L		08-AUG-18	R4163587
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	LAB					30-JUN-18	R4107327
Silicon (Si)-Dissolved	0.330		0.050	mg/L		18-JUL-18	R4132021
Sulfur (S)-Dissolved	1.52		0.50	mg/L		18-JUL-18	R4132021
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		18-JUL-18	R4132021
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0123		0.00030	mg/L		08-AUG-18	R4163649
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		08-AUG-18	R4163649
Arsenic (As)-Total	0.000136		0.000020	mg/L		08-AUG-18	R4163649
Barium (Ba)-Total	0.00423		0.000050	mg/L		08-AUG-18	R4163649
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Boron (B)-Total	<0.0010		0.0010	mg/L		08-AUG-18	R4163649
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		08-AUG-18	R4163649
Cobalt (Co)-Total	0.000303		0.000010	mg/L		08-AUG-18	R4163649
Copper (Cu)-Total	0.00055		0.00010	mg/L		08-AUG-18	R4163649
Iron (Fe)-Total	0.0432		0.0010	mg/L		08-AUG-18	R4163649
Lead (Pb)-Total	0.000018		0.000010	mg/L		08-AUG-18	R4163649

* 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
L2113424-1 BRP-39A							
Sampled By: TH/MK on 11-JUN-18 @ 08:45							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Lithium (Li)-Total	<0.00050		0.00050	mg/L		08-AUG-18	R4163649
Manganese (Mn)-Total	0.0184		0.000050	mg/L		08-AUG-18	R4163649
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Nickel (Ni)-Total	0.00148		0.000060	mg/L		08-AUG-18	R4163649
Selenium (Se)-Total	<0.000040		0.000040	mg/L		08-AUG-18	R4163649
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Strontium (Sr)-Total	0.00608		0.000050	mg/L		08-AUG-18	R4163649
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Tin (Sn)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Titanium (Ti)-Total	0.00018		0.00010	mg/L		08-AUG-18	R4163649
Uranium (U)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Vanadium (V)-Total	<0.00010	DLB	0.00010	mg/L		08-AUG-18	R4163649
Zinc (Zn)-Total	0.00094		0.00080	mg/L		08-AUG-18	R4163649
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.44		0.10	mg/L		23-JUL-18	R4138407
Sulfur (S)-Total	1.77		0.50	mg/L		23-JUL-18	R4138407
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		23-JUL-18	R4138407
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0216		0.0050	mg/L		28-JUN-18	R4107167
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0028		0.0010	mg/L		14-JUL-18	R4125168
Total P in Water by Colour							
Phosphorus (P)-Total	0.0069	RRV	0.0010	mg/L		14-JUL-18	R4125168
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	0.61		0.50	mg/L		19-JUN-18	R4089694
Color, True							
Color, True	14.0		2.0	C.U.		19-JUN-18	R4090022
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		19-JUN-18	R4089694
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	10.3		0.053	mg/L		10-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	12.9			mg/L		10-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0232		0.0050	mg/L		19-JUN-18	R4089694
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		19-JUN-18	R4089694
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	4.54		0.050	mg/L		19-JUN-18	R4089694
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-JUN-18	R4086790
Total Dissolved Solids							
Total Dissolved Solids	42		10	mg/L		19-JUN-18	R4091588
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUN-18	R4094314
Turbidity							
Turbidity	0.43		0.10	NTU		19-JUN-18	R4090243
pH, Conductivity and Total Alkalinity							
pH	6.75		0.10	pH		09-JUL-18	R4117327
Conductivity (EC)	25.6	RRV	2.0	uS/cm		09-JUL-18	R4117327

* 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
L2113424-1 BRP-39A							
Sampled By: TH/MK on 11-JUN-18 @ 08:45							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Bicarbonate (HCO3)	7.1		5.0	mg/L		09-JUL-18	R4117327
Carbonate (CO3)	<5.0		5.0	mg/L		09-JUL-18	R4117327
Hydroxide (OH)	<5.0		5.0	mg/L		09-JUL-18	R4117327
Alkalinity, Total (as CaCO3)	5.8		2.0	mg/L		09-JUL-18	R4117327
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		19-JUN-18	R4090070
Dissolved Organic Carbon	4.32		0.50	mg/L		06-JUL-18	R4115135
Cyanide, Free	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Silicate (as SiO2)	0.899	DLHC	0.050	mg/L		22-JUN-18	R4095492
Cyanide, Total	<0.0050		0.0050	mg/L		21-JUN-18	R4094629
Total Kjeldahl Nitrogen	0.34		0.20	mg/L	10-JUL-18	11-JUL-18	R4122498
Mercury (Hg)-Total	0.00152		0.00050	ug/L		04-JUL-18	R4112757
Total Nitrogen	0.36		0.20	mg/L		11-JUL-18	
Total Organic Carbon	3.92		0.50	mg/L		06-JUL-18	R4115132
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					22-JUN-18	R4095078
Mercury (Hg)-Dissolved	0.00123		0.00050	ug/L	22-JUN-18	06-JUL-18	R4114497
L2113424-2 BRP-39B							
Sampled By: TH/MK on 11-JUN-18 @ 09:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	LAB					08-AUG-18	R4161111
Aluminum (Al)-Dissolved	0.00996		0.00030	mg/L		08-AUG-18	R4163587
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		08-AUG-18	R4163587
Arsenic (As)-Dissolved	0.000146		0.000020	mg/L		08-AUG-18	R4163587
Barium (Ba)-Dissolved	0.00420		0.000050	mg/L		08-AUG-18	R4163587
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Boron (B)-Dissolved	0.0011		0.0010	mg/L		08-AUG-18	R4163587
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Calcium (Ca)-Dissolved	1.74		0.020	mg/L		08-AUG-18	R4163587
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		08-AUG-18	R4163587
Cobalt (Co)-Dissolved	0.000293		0.000010	mg/L		08-AUG-18	R4163587
Copper (Cu)-Dissolved	0.00060		0.00010	mg/L		08-AUG-18	R4163587
Iron (Fe)-Dissolved	0.0204		0.0010	mg/L		08-AUG-18	R4163587
Lead (Pb)-Dissolved	0.000012		0.000010	mg/L		08-AUG-18	R4163587
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		08-AUG-18	R4163587
Magnesium (Mg)-Dissolved	1.41		0.0040	mg/L		08-AUG-18	R4163587
Manganese (Mn)-Dissolved	0.0181		0.000050	mg/L		08-AUG-18	R4163587
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Nickel (Ni)-Dissolved	0.00157		0.000060	mg/L		08-AUG-18	R4163587
Potassium (K)-Dissolved	0.359		0.020	mg/L		08-AUG-18	R4163587
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		08-AUG-18	R4163587
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Sodium (Na)-Dissolved	0.548		0.0050	mg/L		08-AUG-18	R4163587
Strontium (Sr)-Dissolved	0.00600		0.000050	mg/L		08-AUG-18	R4163587
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587

* 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
L2113424-2 BRP-39B							
Sampled By: TH/MK on 11-JUN-18 @ 09:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		08-AUG-18	R4163587
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Zinc (Zn)-Dissolved	0.00093		0.00080	mg/L		08-AUG-18	R4163587
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	LAB					30-JUN-18	R4107327
Silicon (Si)-Dissolved	0.328		0.050	mg/L		18-JUL-18	R4132021
Sulfur (S)-Dissolved	1.73		0.50	mg/L		18-JUL-18	R4132021
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		18-JUL-18	R4132021
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0126		0.00030	mg/L		08-AUG-18	R4163649
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		08-AUG-18	R4163649
Arsenic (As)-Total	0.000157		0.000020	mg/L		08-AUG-18	R4163649
Barium (Ba)-Total	0.00438		0.000050	mg/L		08-AUG-18	R4163649
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Boron (B)-Total	<0.0010		0.0010	mg/L		08-AUG-18	R4163649
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		08-AUG-18	R4163649
Cobalt (Co)-Total	0.000335		0.000010	mg/L		08-AUG-18	R4163649
Copper (Cu)-Total	0.00056		0.00010	mg/L		08-AUG-18	R4163649
Iron (Fe)-Total	0.0436		0.0010	mg/L		08-AUG-18	R4163649
Lead (Pb)-Total	0.000018		0.000010	mg/L		08-AUG-18	R4163649
Lithium (Li)-Total	<0.00050		0.00050	mg/L		08-AUG-18	R4163649
Manganese (Mn)-Total	0.0193		0.000050	mg/L		08-AUG-18	R4163649
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Nickel (Ni)-Total	0.00151		0.000060	mg/L		08-AUG-18	R4163649
Selenium (Se)-Total	<0.000040		0.000040	mg/L		08-AUG-18	R4163649
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Strontium (Sr)-Total	0.00588		0.000050	mg/L		08-AUG-18	R4163649
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Tin (Sn)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Titanium (Ti)-Total	0.00020		0.00010	mg/L		08-AUG-18	R4163649
Uranium (U)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Vanadium (V)-Total	<0.00010	DLB	0.00010	mg/L		08-AUG-18	R4163649
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		08-AUG-18	R4163649
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.42		0.10	mg/L		23-JUL-18	R4138407
Sulfur (S)-Total	1.67		0.50	mg/L		23-JUL-18	R4138407
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		23-JUL-18	R4138407
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0243		0.0050	mg/L		28-JUN-18	R4107167
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0025		0.0010	mg/L		12-JUL-18	R4123785
Total P in Water by Colour							
Phosphorus (P)-Total	0.0061		0.0010	mg/L		12-JUL-18	R4123785
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	0.59		0.50	mg/L		19-JUN-18	R4089694
Color, True							

* 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
L2113424-2 BRP-39B							
Sampled By: TH/MK on 11-JUN-18 @ 09:00							
Matrix: WATER							
Color, True							
Color, True	15.9		2.0	C.U.		19-JUN-18	R4090022
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		19-JUN-18	R4089694
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	10.2		0.053	mg/L		10-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	12.6			mg/L		10-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0219		0.0050	mg/L		19-JUN-18	R4089694
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		19-JUN-18	R4089694
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	4.35		0.050	mg/L		19-JUN-18	R4089694
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-JUN-18	R4086790
Total Dissolved Solids							
Total Dissolved Solids	23		10	mg/L		19-JUN-18	R4091588
Total Suspended Solids							
Total Suspended Solids	3.4		3.0	mg/L		21-JUN-18	R4094314
Turbidity							
Turbidity	0.37		0.10	NTU		19-JUN-18	R4090243
pH, Conductivity and Total Alkalinity							
pH	6.67		0.10	pH		09-JUL-18	R4117327
Conductivity (EC)	24.8	RRV	2.0	uS/cm		09-JUL-18	R4117327
Bicarbonate (HCO3)	7.1		5.0	mg/L		09-JUL-18	R4117327
Carbonate (CO3)	<5.0		5.0	mg/L		09-JUL-18	R4117327
Hydroxide (OH)	<5.0		5.0	mg/L		09-JUL-18	R4117327
Alkalinity, Total (as CaCO3)	5.8		2.0	mg/L		09-JUL-18	R4117327
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		19-JUN-18	R4090070
Dissolved Organic Carbon	4.06		0.50	mg/L		06-JUL-18	R4115135
Cyanide, Free	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Silicate (as SiO2)	0.789	DLHC	0.050	mg/L		22-JUN-18	R4095492
Cyanide, Total	<0.0050		0.0050	mg/L		21-JUN-18	R4094629
Total Kjeldahl Nitrogen	0.25		0.20	mg/L	10-JUL-18	11-JUL-18	R4122498
Mercury (Hg)-Total	0.00161		0.00050	ug/L		04-JUL-18	R4112757
Total Nitrogen	0.27		0.20	mg/L		11-JUL-18	
Total Organic Carbon	3.88		0.50	mg/L		06-JUL-18	R4115132
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					22-JUN-18	R4095078
Mercury (Hg)-Dissolved	0.00139		0.00050	ug/L	22-JUN-18	06-JUL-18	R4114497
L2113424-3 BRP-100							
Sampled By: TH/MK on 11-JUN-18 @ 09:10							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	LAB					08-AUG-18	R4161111
Aluminum (Al)-Dissolved	0.00736		0.00030	mg/L		08-AUG-18	R4163587
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		08-AUG-18	R4163587
Arsenic (As)-Dissolved	0.000126		0.000020	mg/L		08-AUG-18	R4163587

* 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
L2113424-3 BRP-100							
Sampled By: TH/MK on 11-JUN-18 @ 09:10							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Barium (Ba)-Dissolved	0.00373		0.000050	mg/L		08-AUG-18	R4163587
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Boron (B)-Dissolved	0.0011		0.0010	mg/L		08-AUG-18	R4163587
Cadmium (Cd)-Dissolved	0.0000166	DTC	0.0000050	mg/L		13-AUG-18	R4168968
Calcium (Ca)-Dissolved	1.69		0.020	mg/L		08-AUG-18	R4163587
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		13-AUG-18	R4168968
Cobalt (Co)-Dissolved	0.000099		0.000010	mg/L		08-AUG-18	R4163587
Copper (Cu)-Dissolved	0.00054		0.00010	mg/L		08-AUG-18	R4163587
Iron (Fe)-Dissolved	0.0083		0.0010	mg/L		08-AUG-18	R4163587
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		08-AUG-18	R4163587
Magnesium (Mg)-Dissolved	1.28		0.0040	mg/L		08-AUG-18	R4163587
Manganese (Mn)-Dissolved	0.0122		0.000050	mg/L		08-AUG-18	R4163587
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Nickel (Ni)-Dissolved	0.00154		0.000060	mg/L		08-AUG-18	R4163587
Potassium (K)-Dissolved	0.349		0.020	mg/L		08-AUG-18	R4163587
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		08-AUG-18	R4163587
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Sodium (Na)-Dissolved	0.518		0.0050	mg/L		08-AUG-18	R4163587
Strontium (Sr)-Dissolved	0.00579		0.000050	mg/L		08-AUG-18	R4163587
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		13-AUG-18	R4168968
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		08-AUG-18	R4163587
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Zinc (Zn)-Dissolved	0.00176		0.00080	mg/L		08-AUG-18	R4163587
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	LAB					30-JUN-18	R4107327
Silicon (Si)-Dissolved	0.310		0.050	mg/L		18-JUL-18	R4132021
Sulfur (S)-Dissolved	1.42		0.50	mg/L		18-JUL-18	R4132021
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		18-JUL-18	R4132021
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0125		0.00030	mg/L		08-AUG-18	R4163649
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		08-AUG-18	R4163649
Arsenic (As)-Total	0.000130		0.000020	mg/L		08-AUG-18	R4163649
Barium (Ba)-Total	0.00374		0.000050	mg/L		08-AUG-18	R4163649
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Boron (B)-Total	<0.0010		0.0010	mg/L		08-AUG-18	R4163649
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		08-AUG-18	R4163649
Cobalt (Co)-Total	0.000334		0.000010	mg/L		08-AUG-18	R4163649
Copper (Cu)-Total	0.00054		0.00010	mg/L		08-AUG-18	R4163649
Iron (Fe)-Total	0.0441		0.0010	mg/L		08-AUG-18	R4163649
Lead (Pb)-Total	0.000020		0.000010	mg/L		08-AUG-18	R4163649
Lithium (Li)-Total	<0.00050		0.00050	mg/L		08-AUG-18	R4163649
Manganese (Mn)-Total	0.0188		0.000050	mg/L		08-AUG-18	R4163649
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Nickel (Ni)-Total	0.00138		0.000060	mg/L		08-AUG-18	R4163649

* 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
L2113424-3 BRP-100							
Sampled By: TH/MK on 11-JUN-18 @ 09:10							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Selenium (Se)-Total	<0.000040		0.000040	mg/L		08-AUG-18	R4163649
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Strontium (Sr)-Total	0.00582		0.000050	mg/L		08-AUG-18	R4163649
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Tin (Sn)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Titanium (Ti)-Total	0.00027		0.00010	mg/L		08-AUG-18	R4163649
Uranium (U)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Vanadium (V)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		08-AUG-18	R4163649
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.40		0.10	mg/L		23-JUL-18	R4138407
Sulfur (S)-Total	1.61		0.50	mg/L		23-JUL-18	R4138407
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		23-JUL-18	R4138407
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0237		0.0050	mg/L		28-JUN-18	R4107167
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0019		0.0010	mg/L		12-JUL-18	R4123785
Total P in Water by Colour							
Phosphorus (P)-Total	0.0065		0.0010	mg/L		12-JUL-18	R4123785
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	0.57		0.50	mg/L		19-JUN-18	R4089694
Color, True							
Color, True	14.3		2.0	C.U.		19-JUN-18	R4090022
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		19-JUN-18	R4089694
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	9.47		0.053	mg/L		14-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	10.0			mg/L		14-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0184		0.0050	mg/L		19-JUN-18	R4089694
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		19-JUN-18	R4089694
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	4.21		0.050	mg/L		19-JUN-18	R4089694
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-JUN-18	R4086790
Total Dissolved Solids							
Total Dissolved Solids	26		10	mg/L		21-JUN-18	R4095129
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUN-18	R4094314
Turbidity							
Turbidity	0.39		0.10	NTU		19-JUN-18	R4090243
pH, Conductivity and Total Alkalinity							
pH	5.77		0.10	pH		04-JUL-18	R4112556
Conductivity (EC)	24.2		2.0	uS/cm		04-JUL-18	R4112556
Bicarbonate (HCO3)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Carbonate (CO3)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Hydroxide (OH)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Alkalinity, Total (as CaCO3)	2.2		2.0	mg/L		04-JUL-18	R4112556

* 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
L2113424-3 BRP-100							
Sampled By: TH/MK on 11-JUN-18 @ 09:10							
Matrix: WATER							
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		19-JUN-18	R4090070
Dissolved Organic Carbon	4.05		0.50	mg/L		06-JUL-18	R4115135
Cyanide, Free	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Silicate (as SiO2)	0.850	DLHC	0.050	mg/L		22-JUN-18	R4095492
Cyanide, Total	<0.0050		0.0050	mg/L		21-JUN-18	R4094629
Total Kjeldahl Nitrogen	0.23		0.20	mg/L	10-JUL-18	11-JUL-18	R4122498
Mercury (Hg)-Total	0.00162		0.00050	ug/L		04-JUL-18	R4112757
Total Nitrogen	0.25		0.20	mg/L		11-JUL-18	
Total Organic Carbon	3.59		0.50	mg/L		06-JUL-18	R4115132
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					22-JUN-18	R4095078
Mercury (Hg)-Dissolved	0.00134		0.00050	ug/L	22-JUN-18	06-JUL-18	R4114497
L2113424-4 BRP-18							
Sampled By: TH/MK on 11-JUN-18 @ 09:20							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	LAB					08-AUG-18	R4161111
Aluminum (Al)-Dissolved	0.0469		0.00030	mg/L		08-AUG-18	R4163587
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		08-AUG-18	R4163587
Arsenic (As)-Dissolved	0.000303		0.000020	mg/L		08-AUG-18	R4163587
Barium (Ba)-Dissolved	0.00904		0.000050	mg/L		08-AUG-18	R4163587
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Boron (B)-Dissolved	0.0017		0.0010	mg/L		08-AUG-18	R4163587
Cadmium (Cd)-Dissolved	0.0000304		0.0000050	mg/L		08-AUG-18	R4163587
Calcium (Ca)-Dissolved	3.54		0.020	mg/L		08-AUG-18	R4163587
Chromium (Cr)-Dissolved	0.000145		0.000060	mg/L		08-AUG-18	R4163587
Cobalt (Co)-Dissolved	0.000075		0.000010	mg/L		08-AUG-18	R4163587
Copper (Cu)-Dissolved	0.00220		0.00010	mg/L		08-AUG-18	R4163587
Iron (Fe)-Dissolved	0.0136		0.0010	mg/L		08-AUG-18	R4163587
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Lithium (Li)-Dissolved	0.00067		0.00050	mg/L		08-AUG-18	R4163587
Magnesium (Mg)-Dissolved	1.59		0.0040	mg/L		08-AUG-18	R4163587
Manganese (Mn)-Dissolved	0.000847		0.000050	mg/L		08-AUG-18	R4163587
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Nickel (Ni)-Dissolved	0.00532		0.000060	mg/L		08-AUG-18	R4163587
Potassium (K)-Dissolved	0.644		0.020	mg/L		08-AUG-18	R4163587
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		08-AUG-18	R4163587
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Sodium (Na)-Dissolved	0.737		0.0050	mg/L		08-AUG-18	R4163587
Strontium (Sr)-Dissolved	0.0205		0.000050	mg/L		08-AUG-18	R4163587
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Titanium (Ti)-Dissolved	0.00016		0.00010	mg/L		08-AUG-18	R4163587
Uranium (U)-Dissolved	0.000012		0.000010	mg/L		08-AUG-18	R4163587
Vanadium (V)-Dissolved	0.000050		0.000050	mg/L		08-AUG-18	R4163587
Zinc (Zn)-Dissolved	0.00427		0.00080	mg/L		08-AUG-18	R4163587
Dissolved Metals in Water by CRC ICPMS							

* 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
L2113424-4 BRP-18							
Sampled By: TH/MK on 11-JUN-18 @ 09:20							
Matrix: WATER							
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	LAB					30-JUN-18	R4107327
Silicon (Si)-Dissolved	0.417		0.050	mg/L		18-JUL-18	R4132021
Sulfur (S)-Dissolved	1.92		0.50	mg/L		18-JUL-18	R4132021
Zirconium (Zr)-Dissolved	0.000065		0.000060	mg/L		18-JUL-18	R4132021
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0578		0.00030	mg/L		08-AUG-18	R4163649
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		08-AUG-18	R4163649
Arsenic (As)-Total	0.000290		0.000020	mg/L		08-AUG-18	R4163649
Barium (Ba)-Total	0.00821		0.000050	mg/L		08-AUG-18	R4163649
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Boron (B)-Total	0.0014		0.0010	mg/L		08-AUG-18	R4163649
Cadmium (Cd)-Total	0.0000259		0.0000050	mg/L		08-AUG-18	R4163649
Chromium (Cr)-Total	0.000120		0.000060	mg/L		08-AUG-18	R4163649
Cobalt (Co)-Total	0.00110		0.000010	mg/L		08-AUG-18	R4163649
Copper (Cu)-Total	0.00209		0.00010	mg/L		08-AUG-18	R4163649
Iron (Fe)-Total	0.0530		0.0010	mg/L		08-AUG-18	R4163649
Lead (Pb)-Total	0.000013		0.000010	mg/L		08-AUG-18	R4163649
Lithium (Li)-Total	0.00088		0.00050	mg/L		08-AUG-18	R4163649
Manganese (Mn)-Total	0.0249		0.000050	mg/L		08-AUG-18	R4163649
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Nickel (Ni)-Total	0.00488		0.000060	mg/L		08-AUG-18	R4163649
Selenium (Se)-Total	<0.000040		0.000040	mg/L		08-AUG-18	R4163649
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Strontium (Sr)-Total	0.0207		0.000050	mg/L		08-AUG-18	R4163649
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Tin (Sn)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Titanium (Ti)-Total	0.00030		0.00010	mg/L		08-AUG-18	R4163649
Uranium (U)-Total	0.000015		0.000010	mg/L		08-AUG-18	R4163649
Vanadium (V)-Total	<0.00010	DLB	0.00010	mg/L		08-AUG-18	R4163649
Zinc (Zn)-Total	0.00321		0.00080	mg/L		08-AUG-18	R4163649
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.52		0.10	mg/L		23-JUL-18	R4138407
Sulfur (S)-Total	2.32		0.50	mg/L		23-JUL-18	R4138407
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		23-JUL-18	R4138407
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0118		0.0050	mg/L		28-JUN-18	R4107167
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0058		0.0010	mg/L		12-JUL-18	R4123785
Total P in Water by Colour							
Phosphorus (P)-Total	0.0129		0.0010	mg/L		12-JUL-18	R4123785
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	5.24		0.50	mg/L		19-JUN-18	R4089694
Color, True							
Color, True	32.3		2.0	C.U.		19-JUN-18	R4090022
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		19-JUN-18	R4089694
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	15.4		0.053	mg/L		10-AUG-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
L2113424-4 BRP-18							
Sampled By: TH/MK on 11-JUN-18 @ 09:20							
Matrix: WATER							
Ion Balance Calculation							
TDS (Calculated)	17.6			mg/L		10-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0223		0.0050	mg/L		19-JUN-18	R4089694
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	0.0017		0.0010	mg/L		19-JUN-18	R4089694
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	5.72		0.050	mg/L		19-JUN-18	R4089694
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-JUN-18	R4086790
Total Dissolved Solids							
Total Dissolved Solids	46		10	mg/L		21-JUN-18	R4095129
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUN-18	R4094314
Turbidity							
Turbidity	0.40		0.10	NTU		19-JUN-18	R4090243
pH, Conductivity and Total Alkalinity							
pH	5.45		0.10	pH		04-JUL-18	R4112556
Conductivity (EC)	40.0		2.0	uS/cm		04-JUL-18	R4112556
Bicarbonate (HCO3)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Carbonate (CO3)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Hydroxide (OH)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		04-JUL-18	R4112556
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		19-JUN-18	R4090070
Dissolved Organic Carbon	6.49		0.50	mg/L		06-JUL-18	R4115135
Cyanide, Free	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Silicate (as SiO2)	1.03	DLHC	0.050	mg/L		22-JUN-18	R4095492
Cyanide, Total	<0.0050		0.0050	mg/L		21-JUN-18	R4094629
Total Kjeldahl Nitrogen	0.64		0.40	mg/L	10-JUL-18	11-JUL-18	R4122498
Mercury (Hg)-Total	0.00380		0.00050	ug/L		04-JUL-18	R4112757
Total Nitrogen	0.66		0.40	mg/L		11-JUL-18	
Total Organic Carbon	6.07		0.50	mg/L		06-JUL-18	R4115132
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					22-JUN-18	R4095078
Mercury (Hg)-Dissolved	0.00319		0.00050	ug/L	22-JUN-18	06-JUL-18	R4114497
L2113424-5 BRP-19							
Sampled By: TH/MK on 11-JUN-18 @ 10:45							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	LAB					08-AUG-18	R4161111
Aluminum (Al)-Dissolved	0.110		0.00030	mg/L		08-AUG-18	R4163587
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		08-AUG-18	R4163587
Arsenic (As)-Dissolved	0.000314		0.000020	mg/L		08-AUG-18	R4163587
Barium (Ba)-Dissolved	0.0116		0.000050	mg/L		08-AUG-18	R4163587
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Boron (B)-Dissolved	0.0021		0.0010	mg/L		08-AUG-18	R4163587
Cadmium (Cd)-Dissolved	0.0000186		0.0000050	mg/L		08-AUG-18	R4163587
Calcium (Ca)-Dissolved	2.74		0.020	mg/L		08-AUG-18	R4163587

* 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
L2113424-5 BRP-19							
Sampled By: TH/MK on 11-JUN-18 @ 10:45							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Chromium (Cr)-Dissolved	0.000260		0.000060	mg/L		08-AUG-18	R4163587
Cobalt (Co)-Dissolved	0.00232		0.000010	mg/L		08-AUG-18	R4163587
Copper (Cu)-Dissolved	0.00211		0.00010	mg/L		08-AUG-18	R4163587
Iron (Fe)-Dissolved	0.106		0.0010	mg/L		08-AUG-18	R4163587
Lead (Pb)-Dissolved	0.000013		0.000010	mg/L		08-AUG-18	R4163587
Lithium (Li)-Dissolved	0.00053		0.00050	mg/L		08-AUG-18	R4163587
Magnesium (Mg)-Dissolved	1.78		0.0040	mg/L		08-AUG-18	R4163587
Manganese (Mn)-Dissolved	0.0202		0.000050	mg/L		08-AUG-18	R4163587
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Nickel (Ni)-Dissolved	0.00443		0.000060	mg/L		08-AUG-18	R4163587
Potassium (K)-Dissolved	0.593		0.020	mg/L		08-AUG-18	R4163587
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		08-AUG-18	R4163587
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Sodium (Na)-Dissolved	0.687		0.0050	mg/L		08-AUG-18	R4163587
Strontium (Sr)-Dissolved	0.0163		0.000050	mg/L		08-AUG-18	R4163587
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Tin (Sn)-Dissolved	0.000069		0.000050	mg/L		08-AUG-18	R4163587
Titanium (Ti)-Dissolved	0.00035		0.00010	mg/L		08-AUG-18	R4163587
Uranium (U)-Dissolved	0.000014		0.000010	mg/L		08-AUG-18	R4163587
Vanadium (V)-Dissolved	0.000155		0.000050	mg/L		08-AUG-18	R4163587
Zinc (Zn)-Dissolved	0.00299		0.00080	mg/L		08-AUG-18	R4163587
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	LAB					30-JUN-18	R4107327
Silicon (Si)-Dissolved	0.699		0.050	mg/L		18-JUL-18	R4132021
Sulfur (S)-Dissolved	2.94		0.50	mg/L		18-JUL-18	R4132021
Zirconium (Zr)-Dissolved	0.000162		0.000060	mg/L		18-JUL-18	R4132021
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.112		0.00030	mg/L		08-AUG-18	R4163649
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		08-AUG-18	R4163649
Arsenic (As)-Total	0.000305		0.000020	mg/L		08-AUG-18	R4163649
Barium (Ba)-Total	0.0119		0.000050	mg/L		08-AUG-18	R4163649
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Boron (B)-Total	0.0019		0.0010	mg/L		08-AUG-18	R4163649
Cadmium (Cd)-Total	0.0000226		0.0000050	mg/L		08-AUG-18	R4163649
Chromium (Cr)-Total	0.000260		0.000060	mg/L		08-AUG-18	R4163649
Cobalt (Co)-Total	0.00260		0.000010	mg/L		08-AUG-18	R4163649
Copper (Cu)-Total	0.00211		0.00010	mg/L		08-AUG-18	R4163649
Iron (Fe)-Total	0.158		0.0010	mg/L		08-AUG-18	R4163649
Lead (Pb)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Lithium (Li)-Total	0.00068		0.00050	mg/L		08-AUG-18	R4163649
Manganese (Mn)-Total	0.0226		0.000050	mg/L		08-AUG-18	R4163649
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Nickel (Ni)-Total	0.00434		0.000060	mg/L		08-AUG-18	R4163649
Selenium (Se)-Total	<0.000040		0.000040	mg/L		08-AUG-18	R4163649
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Strontium (Sr)-Total	0.0165		0.000050	mg/L		08-AUG-18	R4163649
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Tin (Sn)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Titanium (Ti)-Total	0.00044		0.00010	mg/L		08-AUG-18	R4163649

* 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
L2113424-5 BRP-19							
Sampled By: TH/MK on 11-JUN-18 @ 10:45							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Uranium (U)-Total	0.000016		0.000010	mg/L		08-AUG-18	R4163649
Vanadium (V)-Total	<0.00015	DLB	0.00015	mg/L		08-AUG-18	R4163649
Zinc (Zn)-Total	0.00301		0.00080	mg/L		08-AUG-18	R4163649
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.89		0.10	mg/L		23-JUL-18	R4138407
Sulfur (S)-Total	3.57		0.50	mg/L		23-JUL-18	R4138407
Zirconium (Zr)-Total	0.000132		0.000060	mg/L		23-JUL-18	R4138407
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0179		0.0050	mg/L		28-JUN-18	R4107167
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0053		0.0010	mg/L		12-JUL-18	R4123785
Total P in Water by Colour							
Phosphorus (P)-Total	0.0130		0.0010	mg/L		12-JUL-18	R4123785
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	2.64		0.50	mg/L		19-JUN-18	R4089694
Color, True							
Color, True	55.3		2.0	C.U.		19-JUN-18	R4090022
Fluoride in Water by IC							
Fluoride (F)	0.020		0.020	mg/L		19-JUN-18	R4089694
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	14.2		0.053	mg/L		10-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	17.5			mg/L		10-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		19-JUN-18	R4089694
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		19-JUN-18	R4089694
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	9.03		0.050	mg/L		19-JUN-18	R4089694
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-JUN-18	R4086790
Total Dissolved Solids							
Total Dissolved Solids	49		10	mg/L		21-JUN-18	R4095129
Total Suspended Solids							
Total Suspended Solids	4.7		3.0	mg/L		21-JUN-18	R4094314
Turbidity							
Turbidity	0.36		0.10	NTU		19-JUN-18	R4090243
pH, Conductivity and Total Alkalinity							
pH	4.25		0.10	pH		04-JUL-18	R4112556
Conductivity (EC)	37.0		2.0	uS/cm		04-JUL-18	R4112556
Bicarbonate (HCO3)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Carbonate (CO3)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Hydroxide (OH)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		04-JUL-18	R4112556
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		19-JUN-18	R4090070
Dissolved Organic Carbon	8.85		0.50	mg/L		06-JUL-18	R4115135
Cyanide, Free	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Silicate (as SiO2)	1.59	DLHC	0.050	mg/L		22-JUN-18	R4095492
Cyanide, Total	<0.0050		0.0050	mg/L		21-JUN-18	R4094629

* 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
L2113424-5 BRP-19							
Sampled By: TH/MK on 11-JUN-18 @ 10:45							
Matrix: WATER							
Total Kjeldahl Nitrogen	0.94		0.40	mg/L	10-JUL-18	11-JUL-18	R4122498
Mercury (Hg)-Total	0.00445		0.00050	ug/L		04-JUL-18	R4112757
Total Nitrogen	0.94		0.40	mg/L		11-JUL-18	
Total Organic Carbon	8.71		0.50	mg/L		06-JUL-18	R4115132
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					22-JUN-18	R4095078
Mercury (Hg)-Dissolved	0.00412		0.00050	ug/L	22-JUN-18	06-JUL-18	R4114497
L2113424-6 BRP-23							
Sampled By: TH/MK on 11-JUN-18 @ 11:15							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	LAB					08-AUG-18	R4161111
Aluminum (Al)-Dissolved	0.0252		0.00030	mg/L		08-AUG-18	R4163587
Antimony (Sb)-Dissolved	0.000036		0.000020	mg/L		08-AUG-18	R4163587
Arsenic (As)-Dissolved	0.000185		0.000020	mg/L		08-AUG-18	R4163587
Barium (Ba)-Dissolved	0.00625		0.000050	mg/L		08-AUG-18	R4163587
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Boron (B)-Dissolved	0.0018		0.0010	mg/L		08-AUG-18	R4163587
Cadmium (Cd)-Dissolved	0.0000080		0.0000050	mg/L		08-AUG-18	R4163587
Calcium (Ca)-Dissolved	2.21		0.020	mg/L		08-AUG-18	R4163587
Chromium (Cr)-Dissolved	0.000118		0.000060	mg/L		08-AUG-18	R4163587
Cobalt (Co)-Dissolved	0.000040		0.000010	mg/L		08-AUG-18	R4163587
Copper (Cu)-Dissolved	0.00107		0.00010	mg/L		08-AUG-18	R4163587
Iron (Fe)-Dissolved	0.0049		0.0010	mg/L		08-AUG-18	R4163587
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		08-AUG-18	R4163587
Magnesium (Mg)-Dissolved	1.26		0.0040	mg/L		08-AUG-18	R4163587
Manganese (Mn)-Dissolved	0.000573		0.000050	mg/L		08-AUG-18	R4163587
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Nickel (Ni)-Dissolved	0.00327		0.000060	mg/L		08-AUG-18	R4163587
Potassium (K)-Dissolved	0.575		0.020	mg/L		08-AUG-18	R4163587
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		08-AUG-18	R4163587
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Sodium (Na)-Dissolved	0.608		0.0050	mg/L		08-AUG-18	R4163587
Strontium (Sr)-Dissolved	0.0101		0.000050	mg/L		08-AUG-18	R4163587
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		08-AUG-18	R4163587
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Vanadium (V)-Dissolved	0.000062		0.000050	mg/L		08-AUG-18	R4163587
Zinc (Zn)-Dissolved	0.00320		0.00080	mg/L		08-AUG-18	R4163587
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	LAB					30-JUN-18	R4107327
Silicon (Si)-Dissolved	0.339		0.050	mg/L		18-JUL-18	R4132021
Sulfur (S)-Dissolved	1.52		0.50	mg/L		18-JUL-18	R4132021
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		18-JUL-18	R4132021
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0511		0.00030	mg/L		08-AUG-18	R4163649

* 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
L2113424-6 BRP-23							
Sampled By: TH/MK on 11-JUN-18 @ 11:15							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		08-AUG-18	R4163649
Arsenic (As)-Total	0.000236		0.000020	mg/L		08-AUG-18	R4163649
Barium (Ba)-Total	0.00673		0.000050	mg/L		08-AUG-18	R4163649
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Boron (B)-Total	0.0014		0.0010	mg/L		08-AUG-18	R4163649
Cadmium (Cd)-Total	0.0000145		0.0000050	mg/L		08-AUG-18	R4163649
Chromium (Cr)-Total	0.000138		0.000060	mg/L		08-AUG-18	R4163649
Cobalt (Co)-Total	0.00210		0.000010	mg/L		08-AUG-18	R4163649
Copper (Cu)-Total	0.00118		0.00010	mg/L		08-AUG-18	R4163649
Iron (Fe)-Total	0.157		0.0010	mg/L		08-AUG-18	R4163649
Lead (Pb)-Total	0.000018		0.000010	mg/L		08-AUG-18	R4163649
Lithium (Li)-Total	0.00065		0.00050	mg/L		08-AUG-18	R4163649
Manganese (Mn)-Total	0.0695		0.000050	mg/L		08-AUG-18	R4163649
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Nickel (Ni)-Total	0.00407		0.000060	mg/L		08-AUG-18	R4163649
Selenium (Se)-Total	<0.000040		0.000040	mg/L		08-AUG-18	R4163649
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Strontium (Sr)-Total	0.0112		0.000050	mg/L		08-AUG-18	R4163649
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Tin (Sn)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Titanium (Ti)-Total	0.00074		0.00010	mg/L		08-AUG-18	R4163649
Uranium (U)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Vanadium (V)-Total	<0.00015	DLB	0.00015	mg/L		08-AUG-18	R4163649
Zinc (Zn)-Total	0.00198		0.00080	mg/L		08-AUG-18	R4163649
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.42		0.10	mg/L		23-JUL-18	R4138407
Sulfur (S)-Total	1.97		0.50	mg/L		23-JUL-18	R4138407
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		23-JUL-18	R4138407
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0162		0.0050	mg/L		28-JUN-18	R4107167
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0094		0.0010	mg/L		12-JUL-18	R4123785
Total P in Water by Colour							
Phosphorus (P)-Total	0.0183		0.0010	mg/L		12-JUL-18	R4123785
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	2.84		0.50	mg/L		19-JUN-18	R4089694
Color, True							
Color, True	37.3		2.0	C.U.		19-JUN-18	R4090022
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		19-JUN-18	R4089694
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	10.7		0.053	mg/L		10-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	14.0			mg/L		10-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0102		0.0050	mg/L		19-JUN-18	R4089694
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		19-JUN-18	R4089694
Sulfate in Water by IC (Low Level)							

* 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
L2113424-6 BRP-23							
Sampled By: TH/MK on 11-JUN-18 @ 11:15							
Matrix: WATER							
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	4.82		0.050	mg/L		19-JUN-18	R4089694
Sulphide							
Sulphide (as S)	0.0018		0.0015	mg/L		18-JUN-18	R4086790
Total Dissolved Solids							
Total Dissolved Solids	43		10	mg/L		21-JUN-18	R4095129
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUN-18	R4094314
Turbidity							
Turbidity	0.54		0.10	NTU		19-JUN-18	R4090243
pH, Conductivity and Total Alkalinity							
pH	6.25		0.10	pH		09-JUL-18	R4117327
Conductivity (EC)	29.5	RRV	2.0	uS/cm		09-JUL-18	R4117327
Bicarbonate (HCO3)	<5.0	RRV	5.0	mg/L		09-JUL-18	R4117327
Carbonate (CO3)	<5.0		5.0	mg/L		09-JUL-18	R4117327
Hydroxide (OH)	<5.0		5.0	mg/L		09-JUL-18	R4117327
Alkalinity, Total (as CaCO3)	2.8	RRV	2.0	mg/L		09-JUL-18	R4117327
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		19-JUN-18	R4090070
Dissolved Organic Carbon	7.37		0.50	mg/L		06-JUL-18	R4115135
Cyanide, Free	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Silicate (as SiO2)	0.730	DLHC	0.050	mg/L		22-JUN-18	R4095492
Cyanide, Total	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Total Kjeldahl Nitrogen	0.34		0.20	mg/L	10-JUL-18	11-JUL-18	R4122498
Mercury (Hg)-Total	0.00377		0.00050	ug/L		04-JUL-18	R4112757
Total Nitrogen	0.35		0.20	mg/L		11-JUL-18	
Total Organic Carbon	6.62		0.50	mg/L		06-JUL-18	R4115132
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					22-JUN-18	R4095078
Mercury (Hg)-Dissolved	0.00275		0.00050	ug/L	22-JUN-18	06-JUL-18	R4114497
L2113424-7 BRP-34A							
Sampled By: TH/MK on 11-JUN-18 @ 12:45							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	LAB					08-AUG-18	R4161111
Aluminum (Al)-Dissolved	0.00905		0.00030	mg/L		08-AUG-18	R4163587
Antimony (Sb)-Dissolved	0.000030		0.000020	mg/L		08-AUG-18	R4163587
Arsenic (As)-Dissolved	0.000200		0.000020	mg/L		08-AUG-18	R4163587
Barium (Ba)-Dissolved	0.00761		0.000050	mg/L		08-AUG-18	R4163587
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Boron (B)-Dissolved	0.0018		0.0010	mg/L		08-AUG-18	R4163587
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Calcium (Ca)-Dissolved	3.87		0.020	mg/L		08-AUG-18	R4163587
Chromium (Cr)-Dissolved	0.000093		0.000060	mg/L		08-AUG-18	R4163587
Cobalt (Co)-Dissolved	0.000032		0.000010	mg/L		08-AUG-18	R4163587
Copper (Cu)-Dissolved	0.00128		0.00010	mg/L		08-AUG-18	R4163587
Iron (Fe)-Dissolved	0.0041		0.0010	mg/L		08-AUG-18	R4163587
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587

* 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
L2113424-7 BRP-34A							
Sampled By: TH/MK on 11-JUN-18 @ 12:45							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Lithium (Li)-Dissolved	0.00062		0.00050	mg/L		08-AUG-18	R4163587
Magnesium (Mg)-Dissolved	2.20		0.0040	mg/L		08-AUG-18	R4163587
Manganese (Mn)-Dissolved	0.00122		0.000050	mg/L		08-AUG-18	R4163587
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Nickel (Ni)-Dissolved	0.00413		0.000060	mg/L		08-AUG-18	R4163587
Potassium (K)-Dissolved	0.523		0.020	mg/L		08-AUG-18	R4163587
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		08-AUG-18	R4163587
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Sodium (Na)-Dissolved	0.882		0.0050	mg/L		08-AUG-18	R4163587
Strontium (Sr)-Dissolved	0.0194		0.000050	mg/L		08-AUG-18	R4163587
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Tin (Sn)-Dissolved	0.000064		0.000050	mg/L		08-AUG-18	R4163587
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		08-AUG-18	R4163587
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Zinc (Zn)-Dissolved	0.00126		0.00080	mg/L		08-AUG-18	R4163587
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	LAB					30-JUN-18	R4107327
Silicon (Si)-Dissolved	0.464		0.050	mg/L		18-JUL-18	R4132021
Sulfur (S)-Dissolved	2.94		0.50	mg/L		18-JUL-18	R4132021
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		18-JUL-18	R4132021
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0150		0.00030	mg/L		08-AUG-18	R4163649
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		08-AUG-18	R4163649
Arsenic (As)-Total	0.000226		0.000020	mg/L		08-AUG-18	R4163649
Barium (Ba)-Total	0.00826		0.000050	mg/L		08-AUG-18	R4163649
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Boron (B)-Total	0.0017		0.0010	mg/L		08-AUG-18	R4163649
Cadmium (Cd)-Total	0.0000086		0.0000050	mg/L		08-AUG-18	R4163649
Chromium (Cr)-Total	0.000102		0.000060	mg/L		08-AUG-18	R4163649
Cobalt (Co)-Total	0.000698		0.000010	mg/L		08-AUG-18	R4163649
Copper (Cu)-Total	0.00145		0.00010	mg/L		08-AUG-18	R4163649
Iron (Fe)-Total	0.0575		0.0010	mg/L		08-AUG-18	R4163649
Lead (Pb)-Total	0.000013		0.000010	mg/L		08-AUG-18	R4163649
Lithium (Li)-Total	0.00082		0.00050	mg/L		08-AUG-18	R4163649
Manganese (Mn)-Total	0.0303		0.000050	mg/L		08-AUG-18	R4163649
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Nickel (Ni)-Total	0.00521		0.000060	mg/L		08-AUG-18	R4163649
Selenium (Se)-Total	<0.000040		0.000040	mg/L		08-AUG-18	R4163649
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Strontium (Sr)-Total	0.0198		0.000050	mg/L		08-AUG-18	R4163649
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Tin (Sn)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Titanium (Ti)-Total	0.00021		0.00010	mg/L		08-AUG-18	R4163649
Uranium (U)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Vanadium (V)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Zinc (Zn)-Total	0.00141		0.00080	mg/L		08-AUG-18	R4163649
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.70		0.10	mg/L		23-JUL-18	R4138407
Sulfur (S)-Total	4.24		0.50	mg/L		23-JUL-18	R4138407

* 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
L2113424-7 BRP-34A							
Sampled By: TH/MK on 11-JUN-18 @ 12:45							
Matrix: WATER							
Total Metals in Water by CRC ICPMS							
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		23-JUL-18	R4138407
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0249		0.0050	mg/L		28-JUN-18	R4107167
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0020		0.0010	mg/L		12-JUL-18	R4123785
Total P in Water by Colour							
Phosphorus (P)-Total	0.0053		0.0010	mg/L		12-JUL-18	R4123785
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	3.68		0.50	mg/L		19-JUN-18	R4089694
Color, True							
Color, True	25.3		2.0	C.U.		19-JUN-18	R4090022
Fluoride in Water by IC							
Fluoride (F)	0.020		0.020	mg/L		19-JUN-18	R4089694
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	18.7		0.053	mg/L		10-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	27.7			mg/L		10-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0266		0.0050	mg/L		19-JUN-18	R4089694
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		19-JUN-18	R4089694
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	8.94		0.050	mg/L		19-JUN-18	R4089694
Sulphide							
Sulphide (as S)	0.0015		0.0015	mg/L		18-JUN-18	R4086790
Total Dissolved Solids							
Total Dissolved Solids	44		10	mg/L		21-JUN-18	R4095129
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUN-18	R4094314
Turbidity							
Turbidity	0.46		0.10	NTU		19-JUN-18	R4090243
pH, Conductivity and Total Alkalinity							
pH	6.54		0.10	pH		04-JUL-18	R4112556
Conductivity (EC)	46.7		2.0	uS/cm		04-JUL-18	R4112556
Bicarbonate (HCO3)	15.3		5.0	mg/L		04-JUL-18	R4112556
Carbonate (CO3)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Hydroxide (OH)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Alkalinity, Total (as CaCO3)	12.5		2.0	mg/L		04-JUL-18	R4112556
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		19-JUN-18	R4090070
Dissolved Organic Carbon	5.19		0.50	mg/L		06-JUL-18	R4115135
Cyanide, Free	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Silicate (as SiO2)	1.07	DLHC	0.050	mg/L		22-JUN-18	R4095492
Cyanide, Total	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Total Kjeldahl Nitrogen	0.28		0.20	mg/L	10-JUL-18	11-JUL-18	R4122498
Mercury (Hg)-Total	0.00141		0.00050	ug/L		04-JUL-18	R4112757
Total Nitrogen	0.31		0.20	mg/L		11-JUL-18	
Total Organic Carbon	4.92		0.50	mg/L		06-JUL-18	R4115132
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		22-JUN-18	R4095766

* 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
L2113424-7 BRP-34A							
Sampled By: TH/MK on 11-JUN-18 @ 12:45							
Matrix: WATER							
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					22-JUN-18	R4095078
Mercury (Hg)-Dissolved	0.00120		0.00050	ug/L	22-JUN-18	06-JUL-18	R4114497
L2113424-8 BRP-34B							
Sampled By: TH/MK on 11-JUN-18 @ 13:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	LAB					08-AUG-18	R4161111
Aluminum (Al)-Dissolved	0.0114		0.00030	mg/L		08-AUG-18	R4163587
Antimony (Sb)-Dissolved	0.000024		0.000020	mg/L		08-AUG-18	R4163587
Arsenic (As)-Dissolved	0.000181		0.000020	mg/L		08-AUG-18	R4163587
Barium (Ba)-Dissolved	0.00673		0.000050	mg/L		08-AUG-18	R4163587
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Boron (B)-Dissolved	0.0028		0.0010	mg/L		08-AUG-18	R4163587
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Calcium (Ca)-Dissolved	3.80		0.020	mg/L		08-AUG-18	R4163587
Chromium (Cr)-Dissolved	0.000905	DTC	0.000060	mg/L		13-AUG-18	R4168968
Cobalt (Co)-Dissolved	0.000040		0.000010	mg/L		08-AUG-18	R4163587
Copper (Cu)-Dissolved	0.00121		0.00010	mg/L		08-AUG-18	R4163587
Iron (Fe)-Dissolved	0.0038		0.0010	mg/L		08-AUG-18	R4163587
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Lithium (Li)-Dissolved	0.00080		0.00050	mg/L		08-AUG-18	R4163587
Magnesium (Mg)-Dissolved	2.20		0.0040	mg/L		08-AUG-18	R4163587
Manganese (Mn)-Dissolved	0.00485		0.000050	mg/L		08-AUG-18	R4163587
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Nickel (Ni)-Dissolved	0.00460		0.000060	mg/L		08-AUG-18	R4163587
Potassium (K)-Dissolved	0.575		0.020	mg/L		08-AUG-18	R4163587
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		08-AUG-18	R4163587
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Sodium (Na)-Dissolved	1.20		0.0050	mg/L		08-AUG-18	R4163587
Strontium (Sr)-Dissolved	0.0242		0.000050	mg/L		08-AUG-18	R4163587
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Tin (Sn)-Dissolved	0.000074		0.000050	mg/L		08-AUG-18	R4163587
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		08-AUG-18	R4163587
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Zinc (Zn)-Dissolved	0.00131		0.00080	mg/L		08-AUG-18	R4163587
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	LAB					30-JUN-18	R4107327
Silicon (Si)-Dissolved	0.464		0.050	mg/L		18-JUL-18	R4132021
Sulfur (S)-Dissolved	2.92		0.50	mg/L		18-JUL-18	R4132021
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		18-JUL-18	R4132021
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0202		0.00030	mg/L		08-AUG-18	R4163649
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		08-AUG-18	R4163649
Arsenic (As)-Total	0.000238		0.000020	mg/L		08-AUG-18	R4163649
Barium (Ba)-Total	0.00826		0.000050	mg/L		08-AUG-18	R4163649
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649

* 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
L2113424-8 BRP-34B							
Sampled By: TH/MK on 11-JUN-18 @ 13:00							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Boron (B)-Total	0.0017		0.0010	mg/L		08-AUG-18	R4163649
Cadmium (Cd)-Total	0.0000092		0.0000050	mg/L		08-AUG-18	R4163649
Chromium (Cr)-Total	0.000086		0.000060	mg/L		08-AUG-18	R4163649
Cobalt (Co)-Total	0.000863		0.000010	mg/L		08-AUG-18	R4163649
Copper (Cu)-Total	0.00138		0.00010	mg/L		08-AUG-18	R4163649
Iron (Fe)-Total	0.0621		0.0010	mg/L		08-AUG-18	R4163649
Lead (Pb)-Total	0.000011		0.000010	mg/L		08-AUG-18	R4163649
Lithium (Li)-Total	0.00081		0.00050	mg/L		08-AUG-18	R4163649
Manganese (Mn)-Total	0.0364		0.000050	mg/L		08-AUG-18	R4163649
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Nickel (Ni)-Total	0.00524		0.000060	mg/L		08-AUG-18	R4163649
Selenium (Se)-Total	<0.000040		0.000040	mg/L		08-AUG-18	R4163649
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Strontium (Sr)-Total	0.0198		0.000050	mg/L		08-AUG-18	R4163649
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Tin (Sn)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Titanium (Ti)-Total	0.00017		0.00010	mg/L		08-AUG-18	R4163649
Uranium (U)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Vanadium (V)-Total	<0.00010	DLB	0.00010	mg/L		08-AUG-18	R4163649
Zinc (Zn)-Total	0.00171		0.00080	mg/L		08-AUG-18	R4163649
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.58		0.10	mg/L		23-JUL-18	R4138407
Sulfur (S)-Total	3.38		0.50	mg/L		23-JUL-18	R4138407
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		23-JUL-18	R4138407
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0240		0.0050	mg/L		28-JUN-18	R4107167
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0054		0.0010	mg/L		12-JUL-18	R4123785
Total P in Water by Colour							
Phosphorus (P)-Total	0.0064		0.0010	mg/L		12-JUL-18	R4123785
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	3.76		0.50	mg/L		19-JUN-18	R4089694
Color, True							
Color, True	19.5		2.0	C.U.		19-JUN-18	R4090022
Fluoride in Water by IC							
Fluoride (F)	0.020		0.020	mg/L		19-JUN-18	R4089694
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	18.5		0.053	mg/L		14-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	20.4			mg/L		14-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0279		0.0050	mg/L		19-JUN-18	R4089694
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		19-JUN-18	R4089694
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	8.76		0.050	mg/L		19-JUN-18	R4089694
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-JUN-18	R4086790
Total Dissolved Solids							
Total Dissolved Solids	49		10	mg/L		21-JUN-18	R4095129

* 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
L2113424-8 BRP-34B							
Sampled By: TH/MK on 11-JUN-18 @ 13:00							
Matrix: WATER							
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUN-18	R4094314
Turbidity							
Turbidity	0.35		0.10	NTU		19-JUN-18	R4090243
pH, Conductivity and Total Alkalinity							
pH	4.47		0.10	pH		04-JUL-18	R4112556
Conductivity (EC)	46.2		2.0	uS/cm		04-JUL-18	R4112556
Bicarbonate (HCO3)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Carbonate (CO3)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Hydroxide (OH)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		04-JUL-18	R4112556
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		19-JUN-18	R4090070
Dissolved Organic Carbon	5.22		0.50	mg/L		11-JUL-18	R4123090
Cyanide, Free	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Silicate (as SiO2)	1.12	DLHC	0.050	mg/L		22-JUN-18	R4095492
Cyanide, Total	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Total Kjeldahl Nitrogen	0.28		0.20	mg/L	10-JUL-18	11-JUL-18	R4122498
Mercury (Hg)-Total	0.00169		0.00050	ug/L		04-JUL-18	R4112757
Total Nitrogen	0.31		0.20	mg/L		11-JUL-18	
Total Organic Carbon	5.25		0.50	mg/L		06-JUL-18	R4115132
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					22-JUN-18	R4095078
Mercury (Hg)-Dissolved	0.00133		0.00050	ug/L	22-JUN-18	06-JUL-18	R4114497
L2113424-9 BRP-37A							
Sampled By: TH/MK on 11-JUN-18 @ 13:30							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	LAB					08-AUG-18	R4161111
Aluminum (Al)-Dissolved	0.00526		0.00030	mg/L		08-AUG-18	R4163587
Antimony (Sb)-Dissolved	0.000043		0.000020	mg/L		08-AUG-18	R4163587
Arsenic (As)-Dissolved	0.000172		0.000020	mg/L		08-AUG-18	R4163587
Barium (Ba)-Dissolved	0.00528		0.000050	mg/L		08-AUG-18	R4163587
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Boron (B)-Dissolved	0.0014		0.0010	mg/L		08-AUG-18	R4163587
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Calcium (Ca)-Dissolved	2.66		0.020	mg/L		08-AUG-18	R4163587
Chromium (Cr)-Dissolved	0.000068		0.000060	mg/L		08-AUG-18	R4163587
Cobalt (Co)-Dissolved	0.000055		0.000010	mg/L		08-AUG-18	R4163587
Copper (Cu)-Dissolved	0.00085		0.00010	mg/L		08-AUG-18	R4163587
Iron (Fe)-Dissolved	0.0027		0.0010	mg/L		08-AUG-18	R4163587
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		08-AUG-18	R4163587
Magnesium (Mg)-Dissolved	1.58		0.0040	mg/L		08-AUG-18	R4163587
Manganese (Mn)-Dissolved	0.0104		0.000050	mg/L		08-AUG-18	R4163587
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Nickel (Ni)-Dissolved	0.00321		0.000060	mg/L		08-AUG-18	R4163587
Potassium (K)-Dissolved	0.398		0.020	mg/L		08-AUG-18	R4163587

* 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
L2113424-9 BRP-37A							
Sampled By: TH/MK on 11-JUN-18 @ 13:30							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		08-AUG-18	R4163587
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Sodium (Na)-Dissolved	0.673		0.0050	mg/L		08-AUG-18	R4163587
Strontium (Sr)-Dissolved	0.0120		0.000050	mg/L		08-AUG-18	R4163587
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Tin (Sn)-Dissolved	0.000089		0.000050	mg/L		08-AUG-18	R4163587
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		08-AUG-18	R4163587
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Zinc (Zn)-Dissolved	0.00103		0.00080	mg/L		08-AUG-18	R4163587
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	LAB					30-JUN-18	R4107327
Silicon (Si)-Dissolved	0.268		0.050	mg/L		18-JUL-18	R4132021
Sulfur (S)-Dissolved	1.97		0.50	mg/L		18-JUL-18	R4132021
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		18-JUL-18	R4132021
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00719		0.00030	mg/L		08-AUG-18	R4163649
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		08-AUG-18	R4163649
Arsenic (As)-Total	0.000156		0.000020	mg/L		08-AUG-18	R4163649
Barium (Ba)-Total	0.00543		0.000050	mg/L		08-AUG-18	R4163649
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Boron (B)-Total	0.0013		0.0010	mg/L		08-AUG-18	R4163649
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		08-AUG-18	R4163649
Cobalt (Co)-Total	0.000273		0.000010	mg/L		08-AUG-18	R4163649
Copper (Cu)-Total	0.00104		0.00010	mg/L		08-AUG-18	R4163649
Iron (Fe)-Total	0.0312		0.0010	mg/L		08-AUG-18	R4163649
Lead (Pb)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Lithium (Li)-Total	0.00063		0.00050	mg/L		08-AUG-18	R4163649
Manganese (Mn)-Total	0.0211		0.000050	mg/L		08-AUG-18	R4163649
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Nickel (Ni)-Total	0.00333		0.000060	mg/L		08-AUG-18	R4163649
Selenium (Se)-Total	<0.000040		0.000040	mg/L		08-AUG-18	R4163649
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Strontium (Sr)-Total	0.0123		0.000050	mg/L		08-AUG-18	R4163649
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Tin (Sn)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		08-AUG-18	R4163649
Uranium (U)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Vanadium (V)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		08-AUG-18	R4163649
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.34		0.10	mg/L		23-JUL-18	R4138407
Sulfur (S)-Total	2.24		0.50	mg/L		23-JUL-18	R4138407
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		23-JUL-18	R4138407
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0166		0.0050	mg/L		28-JUN-18	R4107167
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0016		0.0010	mg/L		12-JUL-18	R4123785

* 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
L2113424-9 BRP-37A							
Sampled By: TH/MK on 11-JUN-18 @ 13:30							
Matrix: WATER							
Total P in Water by Colour							
Phosphorus (P)-Total	0.0027		0.0010	mg/L		12-JUL-18	R4123785
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	1.94		0.50	mg/L		19-JUN-18	R4089694
Color, True							
Color, True	8.3		2.0	C.U.		19-JUN-18	R4090022
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		19-JUN-18	R4089694
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	13.2		0.053	mg/L		10-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	18.3			mg/L		10-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0331		0.0050	mg/L		19-JUN-18	R4089694
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		19-JUN-18	R4089694
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	6.08		0.050	mg/L		19-JUN-18	R4089694
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-JUN-18	R4086790
Total Dissolved Solids							
Total Dissolved Solids	33		10	mg/L		21-JUN-18	R4095129
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUN-18	R4094314
Turbidity							
Turbidity	0.33		0.10	NTU		19-JUN-18	R4090243
pH, Conductivity and Total Alkalinity							
pH	5.95		0.10	pH		04-JUL-18	R4112556
Conductivity (EC)	33.7		2.0	uS/cm		04-JUL-18	R4112556
Bicarbonate (HCO3)	9.9		5.0	mg/L		04-JUL-18	R4112556
Carbonate (CO3)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Hydroxide (OH)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Alkalinity, Total (as CaCO3)	8.1		2.0	mg/L		04-JUL-18	R4112556
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		19-JUN-18	R4090070
Dissolved Organic Carbon	3.91		0.50	mg/L		06-JUL-18	R4115135
Cyanide, Free	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Silicate (as SiO2)	0.674	DLHC	0.050	mg/L		22-JUN-18	R4095492
Cyanide, Total	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Total Kjeldahl Nitrogen	0.21		0.20	mg/L	10-JUL-18	11-JUL-18	R4122498
Mercury (Hg)-Total	0.00056		0.00050	ug/L		04-JUL-18	R4112757
Total Nitrogen	0.25		0.20	mg/L		11-JUL-18	
Total Organic Carbon	3.85		0.50	mg/L		06-JUL-18	R4115132
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					22-JUN-18	R4095078
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	22-JUN-18	06-JUL-18	R4114497
L2113424-10 BRP-37B							
Sampled By: TH/MK on 11-JUN-18 @ 14:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							

* 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
L2113424-10 BRP-37B							
Sampled By: TH/MK on 11-JUN-18 @ 14:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	LAB					08-AUG-18	R4161111
Aluminum (Al)-Dissolved	0.00505		0.00030	mg/L		08-AUG-18	R4163587
Antimony (Sb)-Dissolved	0.000165		0.000020	mg/L		18-AUG-18	R4176070
Arsenic (As)-Dissolved	0.000186		0.000020	mg/L		08-AUG-18	R4163587
Barium (Ba)-Dissolved	0.00562		0.000050	mg/L		08-AUG-18	R4163587
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Boron (B)-Dissolved	0.0014		0.0010	mg/L		08-AUG-18	R4163587
Cadmium (Cd)-Dissolved	0.0000051		0.0000050	mg/L		08-AUG-18	R4163587
Calcium (Ca)-Dissolved	2.64		0.020	mg/L		08-AUG-18	R4163587
Chromium (Cr)-Dissolved	0.000070		0.000060	mg/L		08-AUG-18	R4163587
Cobalt (Co)-Dissolved	0.000177		0.000010	mg/L		08-AUG-18	R4163587
Copper (Cu)-Dissolved	0.00093		0.00010	mg/L		08-AUG-18	R4163587
Iron (Fe)-Dissolved	0.0027		0.0010	mg/L		08-AUG-18	R4163587
Lead (Pb)-Dissolved	0.000012		0.000010	mg/L		08-AUG-18	R4163587
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		08-AUG-18	R4163587
Magnesium (Mg)-Dissolved	1.63		0.0040	mg/L		08-AUG-18	R4163587
Manganese (Mn)-Dissolved	0.0166		0.000050	mg/L		08-AUG-18	R4163587
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Nickel (Ni)-Dissolved	0.00335		0.000060	mg/L		08-AUG-18	R4163587
Potassium (K)-Dissolved	0.417		0.020	mg/L		08-AUG-18	R4163587
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		08-AUG-18	R4163587
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Sodium (Na)-Dissolved	0.695		0.0050	mg/L		08-AUG-18	R4163587
Strontium (Sr)-Dissolved	0.0122		0.000050	mg/L		08-AUG-18	R4163587
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Tin (Sn)-Dissolved	0.000129		0.000050	mg/L		18-AUG-18	R4176070
Tin (Sn)-Dissolved	0.000085		0.000050	mg/L		08-AUG-18	R4163649
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		08-AUG-18	R4163587
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Zinc (Zn)-Dissolved	0.00119		0.00080	mg/L		08-AUG-18	R4163587
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	LAB					30-JUN-18	R4107327
Silicon (Si)-Dissolved	0.276		0.050	mg/L		18-JUL-18	R4132021
Sulfur (S)-Dissolved	2.06		0.50	mg/L		18-JUL-18	R4132021
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		18-JUL-18	R4132021
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00665		0.00030	mg/L		08-AUG-18	R4163649
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		08-AUG-18	R4163649
Arsenic (As)-Total	0.000158		0.000020	mg/L		08-AUG-18	R4163649
Barium (Ba)-Total	0.00560		0.000050	mg/L		08-AUG-18	R4163649
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Boron (B)-Total	0.0013		0.0010	mg/L		08-AUG-18	R4163649
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Chromium (Cr)-Total	0.000062		0.000060	mg/L		08-AUG-18	R4163649
Cobalt (Co)-Total	0.000275		0.000010	mg/L		08-AUG-18	R4163649
Copper (Cu)-Total	0.00107		0.00010	mg/L		08-AUG-18	R4163649
Iron (Fe)-Total	0.0266		0.0010	mg/L		08-AUG-18	R4163649

* 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
L2113424-10 BRP-37B							
Sampled By: TH/MK on 11-JUN-18 @ 14:00							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Lead (Pb)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Lithium (Li)-Total	0.00064		0.00050	mg/L		08-AUG-18	R4163649
Manganese (Mn)-Total	0.0222		0.000050	mg/L		08-AUG-18	R4163649
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Nickel (Ni)-Total	0.00342		0.000060	mg/L		08-AUG-18	R4163649
Selenium (Se)-Total	<0.000040		0.000040	mg/L		08-AUG-18	R4163649
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Strontium (Sr)-Total	0.0124		0.000050	mg/L		08-AUG-18	R4163649
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Tin (Sn)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		08-AUG-18	R4163649
Uranium (U)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Vanadium (V)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Zinc (Zn)-Total	0.00083		0.00080	mg/L		08-AUG-18	R4163649
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.32		0.10	mg/L		23-JUL-18	R4138407
Sulfur (S)-Total	2.22		0.50	mg/L		23-JUL-18	R4138407
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		23-JUL-18	R4138407
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0163		0.0050	mg/L		28-JUN-18	R4107167
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0013		0.0010	mg/L		12-JUL-18	R4123785
Total P in Water by Colour							
Phosphorus (P)-Total	0.0037		0.0010	mg/L		12-JUL-18	R4123785
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	2.02		0.50	mg/L		19-JUN-18	R4089694
Color, True							
Color, True	7.0		2.0	C.U.		19-JUN-18	R4090022
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		19-JUN-18	R4089694
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	13.3		0.053	mg/L		18-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	13.6			mg/L		10-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0329		0.0050	mg/L		19-JUN-18	R4089694
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		19-JUN-18	R4089694
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	6.04		0.050	mg/L		19-JUN-18	R4089694
Sulphide							
Sulphide (as S)	0.0016		0.0015	mg/L		18-JUN-18	R4086790
Total Dissolved Solids							
Total Dissolved Solids	40		10	mg/L		21-JUN-18	R4095129
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUN-18	R4094314
Turbidity							
Turbidity	0.28		0.10	NTU		19-JUN-18	R4090243
pH, Conductivity and Total Alkalinity							
pH	4.79		0.10	pH		04-JUL-18	R4112556

* 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
L2113424-10 BRP-37B							
Sampled By: TH/MK on 11-JUN-18 @ 14:00							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Conductivity (EC)	34.0		2.0	uS/cm		04-JUL-18	R4112556
Bicarbonate (HCO3)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Carbonate (CO3)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Hydroxide (OH)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		04-JUL-18	R4112556
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		19-JUN-18	R4090070
Dissolved Organic Carbon	3.94		0.50	mg/L		06-JUL-18	R4115135
Cyanide, Free	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Silicate (as SiO2)	0.668	DLHC	0.050	mg/L		22-JUN-18	R4095492
Cyanide, Total	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Total Kjeldahl Nitrogen	0.22		0.20	mg/L	10-JUL-18	11-JUL-18	R4122498
Mercury (Hg)-Total	0.00054		0.00050	ug/L		04-JUL-18	R4112757
Total Nitrogen	0.26		0.20	mg/L		11-JUL-18	
Total Organic Carbon	3.76		0.50	mg/L		06-JUL-18	R4115132
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					22-JUN-18	R4095078
Mercury (Hg)-Dissolved	0.00054		0.00050	ug/L	22-JUN-18	06-JUL-18	R4114497
L2113424-11 BRP-101							
Sampled By: TH/MK on 11-JUN-18 @ 15:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	LAB					08-AUG-18	R4161111
Aluminum (Al)-Dissolved	<0.00030		0.00030	mg/L		08-AUG-18	R4163587
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		13-AUG-18	R4168968
Arsenic (As)-Dissolved	<0.000020		0.000020	mg/L		08-AUG-18	R4163587
Barium (Ba)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		08-AUG-18	R4163587
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Calcium (Ca)-Dissolved	<0.020		0.020	mg/L		08-AUG-18	R4163587
Cobalt (Co)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Copper (Cu)-Dissolved	<0.00010		0.00010	mg/L		08-AUG-18	R4163587
Iron (Fe)-Dissolved	<0.0010		0.0010	mg/L		08-AUG-18	R4163587
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		08-AUG-18	R4163587
Magnesium (Mg)-Dissolved	<0.0040		0.0040	mg/L		08-AUG-18	R4163587
Manganese (Mn)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Nickel (Ni)-Dissolved	<0.000060		0.000060	mg/L		08-AUG-18	R4163587
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		08-AUG-18	R4163587
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Sodium (Na)-Dissolved	0.0303	RRV	0.0050	mg/L		13-AUG-18	R4168968
Strontium (Sr)-Dissolved	<0.000050		0.000050	mg/L		13-AUG-18	R4168968
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		13-AUG-18	R4168968
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		08-AUG-18	R4163587

* 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
L2113424-11 BRP-101							
Sampled By: TH/MK on 11-JUN-18 @ 15:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		08-AUG-18	R4163587
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	LAB					30-JUN-18	R4107327
Silicon (Si)-Dissolved	<0.050		0.050	mg/L		18-JUL-18	R4132021
Sulfur (S)-Dissolved	<0.50		0.50	mg/L		18-JUL-18	R4132021
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		18-JUL-18	R4132021
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	<0.00030		0.00030	mg/L		18-AUG-18	R4176070
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		08-AUG-18	R4163649
Arsenic (As)-Total	<0.000020		0.000020	mg/L		08-AUG-18	R4163649
Barium (Ba)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Boron (B)-Total	<0.0010		0.0010	mg/L		08-AUG-18	R4163649
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		08-AUG-18	R4163649
Cobalt (Co)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Copper (Cu)-Total	<0.00010		0.00010	mg/L		08-AUG-18	R4163649
Iron (Fe)-Total	<0.0010		0.0010	mg/L		08-AUG-18	R4163649
Lead (Pb)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Lithium (Li)-Total	<0.00050		0.00050	mg/L		08-AUG-18	R4163649
Manganese (Mn)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Nickel (Ni)-Total	<0.000060		0.000060	mg/L		13-AUG-18	R4168968
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Strontium (Sr)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Tin (Sn)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		08-AUG-18	R4163649
Uranium (U)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Vanadium (V)-Total	<0.000050		0.000050	mg/L		13-AUG-18	R4168968
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		08-AUG-18	R4163649
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	<0.10		0.10	mg/L		23-JUL-18	R4138407
Sulfur (S)-Total	<0.50		0.50	mg/L		23-JUL-18	R4138407
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		23-JUL-18	R4138407
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		28-JUN-18	R4107167
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0013		0.0010	mg/L		12-JUL-18	R4123785
Total P in Water by Colour							
Phosphorus (P)-Total	0.0027		0.0010	mg/L		12-JUL-18	R4123785
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		19-JUN-18	R4089694
Color, True							
Color, True	<2.0		2.0	C.U.		19-JUN-18	R4090022
Fluoride in Water by IC							

* 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
L2113424-11 BRP-101							
Sampled By: TH/MK on 11-JUN-18 @ 15:00							
Matrix: WATER							
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		19-JUN-18	R4089694
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	<0.053		0.053	mg/L		14-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	<1.0			mg/L		14-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		19-JUN-18	R4089694
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		19-JUN-18	R4089694
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	<0.050		0.050	mg/L		19-JUN-18	R4089694
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-JUN-18	R4086790
Total Dissolved Solids							
Total Dissolved Solids	<10		10	mg/L		21-JUN-18	R4095129
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUN-18	R4094314
Turbidity							
Turbidity	<0.10		0.10	NTU		19-JUN-18	R4090243
pH, Conductivity and Total Alkalinity							
pH	4.14		0.10	pH		04-JUL-18	R4112556
Conductivity (EC)	<2.0		2.0	uS/cm		04-JUL-18	R4112556
Bicarbonate (HCO3)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Carbonate (CO3)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Hydroxide (OH)	<5.0		5.0	mg/L		04-JUL-18	R4112556
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		04-JUL-18	R4112556
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		19-JUN-18	R4090070
Dissolved Organic Carbon	<0.50		0.50	mg/L		06-JUL-18	R4115135
Cyanide, Free	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Silicate (as SiO2)	<0.010		0.010	mg/L		22-JUN-18	R4095492
Cyanide, Total	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	10-JUL-18	11-JUL-18	R4122498
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		04-JUL-18	R4112757
Total Nitrogen	<0.20		0.20	mg/L		11-JUL-18	
Total Organic Carbon	<0.50		0.50	mg/L		06-JUL-18	R4115132
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		22-JUN-18	R4095766
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					22-JUN-18	R4095078
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	22-JUN-18	06-JUL-18	R4114497
L2113424-12 BRP-103							
Sampled By: TH/MK on 11-JUN-18 @ 16:00							
Matrix: WATER							
Miscellaneous Parameters							
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		04-JUL-18	R4112757
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					22-JUN-18	R4095078
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	22-JUN-18	06-JUL-18	R4114497

* 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
L2113424-13 BRP-102							
Sampled By: TH/MK on 12-JUN-18 @ 08:30							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	LAB					08-AUG-18	R4161111
Aluminum (Al)-Dissolved	<0.00030		0.00030	mg/L		08-AUG-18	R4163587
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		13-AUG-18	R4168968
Arsenic (As)-Dissolved	<0.000020		0.000020	mg/L		08-AUG-18	R4163587
Barium (Ba)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		13-AUG-18	R4168968
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		08-AUG-18	R4163587
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Calcium (Ca)-Dissolved	<0.020		0.020	mg/L		08-AUG-18	R4163587
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		08-AUG-18	R4163587
Cobalt (Co)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Copper (Cu)-Dissolved	<0.00010		0.00010	mg/L		08-AUG-18	R4163587
Iron (Fe)-Dissolved	<0.0010		0.0010	mg/L		08-AUG-18	R4163587
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		08-AUG-18	R4163587
Magnesium (Mg)-Dissolved	<0.0040		0.0040	mg/L		08-AUG-18	R4163587
Manganese (Mn)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Nickel (Ni)-Dissolved	<0.000060		0.000060	mg/L		13-AUG-18	R4168968
Potassium (K)-Dissolved	<0.020		0.020	mg/L		08-AUG-18	R4163587
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		08-AUG-18	R4163587
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Sodium (Na)-Dissolved	0.0240	RRV	0.0050	mg/L		13-AUG-18	R4168968
Strontium (Sr)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163587
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		08-AUG-18	R4163587
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		08-AUG-18	R4163587
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		08-AUG-18	R4163587
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		13-AUG-18	R4168968
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		08-AUG-18	R4163587
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	LAB					30-JUN-18	R4107327
Silicon (Si)-Dissolved	<0.050		0.050	mg/L		18-JUL-18	R4132021
Sulfur (S)-Dissolved	<0.50		0.50	mg/L		18-JUL-18	R4132021
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		18-JUL-18	R4132021
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	<0.0012	DLAI	0.0012	mg/L		08-AUG-18	R4163649
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		08-AUG-18	R4163649
Arsenic (As)-Total	<0.000020		0.000020	mg/L		08-AUG-18	R4163649
Barium (Ba)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Boron (B)-Total	<0.0010		0.0010	mg/L		08-AUG-18	R4163649
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		08-AUG-18	R4163649
Cobalt (Co)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Copper (Cu)-Total	<0.00010		0.00010	mg/L		08-AUG-18	R4163649
Iron (Fe)-Total	<0.0010		0.0010	mg/L		08-AUG-18	R4163649
Lead (Pb)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649

* 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
L2113424-13 BRP-102							
Sampled By: TH/MK on 12-JUN-18 @ 08:30							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Lithium (Li)-Total	<0.00050		0.00050	mg/L		08-AUG-18	R4163649
Manganese (Mn)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Nickel (Ni)-Total	0.000102		0.000060	mg/L		08-AUG-18	R4163649
Selenium (Se)-Total	<0.000040		0.000040	mg/L		08-AUG-18	R4163649
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Strontium (Sr)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		08-AUG-18	R4163649
Tin (Sn)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		08-AUG-18	R4163649
Uranium (U)-Total	<0.000010		0.000010	mg/L		08-AUG-18	R4163649
Vanadium (V)-Total	<0.000050		0.000050	mg/L		08-AUG-18	R4163649
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		08-AUG-18	R4163649
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	<0.10		0.10	mg/L		23-JUL-18	R4138407
Sulfur (S)-Total	<0.50		0.50	mg/L		23-JUL-18	R4138407
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		23-JUL-18	R4138407
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		28-JUN-18	R4107167
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	<0.0010		0.0010	mg/L		12-JUL-18	R4123785
Total P in Water by Colour							
Phosphorus (P)-Total	<0.0010		0.0010	mg/L		12-JUL-18	R4123785
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		19-JUN-18	R4089694
Color, True							
Color, True	<2.0		2.0	C.U.		19-JUN-18	R4090022
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		19-JUN-18	R4089694
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	<0.053		0.053	mg/L		14-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	<1.0			mg/L		14-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		22-JUN-18	R4097518
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		19-JUN-18	R4089694
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	<0.050		0.050	mg/L		19-JUN-18	R4089694
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-JUN-18	R4086790
Total Dissolved Solids							
Total Dissolved Solids	<10		10	mg/L		21-JUN-18	R4095129
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUN-18	R4094314
Turbidity							
Turbidity	<0.10		0.10	NTU		19-JUN-18	R4090243
pH, Conductivity and Total Alkalinity							
pH	4.72		0.10	pH		12-JUL-18	R4123737
Conductivity (EC)	<2.0		2.0	uS/cm		12-JUL-18	R4123737

* 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
L2113424-13 BRP-102							
Sampled By: TH/MK on 12-JUN-18 @ 08:30							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Bicarbonate (HCO3)	<5.0		5.0	mg/L		12-JUL-18	R4123737
Carbonate (CO3)	<5.0		5.0	mg/L		12-JUL-18	R4123737
Hydroxide (OH)	<5.0		5.0	mg/L		12-JUL-18	R4123737
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		12-JUL-18	R4123737
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		19-JUN-18	R4090070
Dissolved Organic Carbon	<0.50		0.50	mg/L		06-JUL-18	R4115135
Cyanide, Free	<0.0050		0.0050	mg/L		23-JUN-18	R4095858
Silicate (as SiO2)	<0.010		0.010	mg/L		22-JUN-18	R4095492
Cyanide, Total	<0.0050		0.0050	mg/L		23-JUN-18	R4095858
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	10-JUL-18	11-JUL-18	R4122498
Total Nitrogen	<0.20		0.20	mg/L		11-JUL-18	
Total Organic Carbon	<0.50		0.50	mg/L		06-JUL-18	R4115132
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		23-JUN-18	R4095858

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLAI	Detection limit raised due to low level analytical interference or background.
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-DOC-HTC-WP	Water	Dissolved Organic Carbon by Combustion	APHA 5310 B-WP
Filtered (0.45 um) sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.			
C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP
Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.			
CL-IC-N-ED	Water	Chloride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
CN-FREE-CFA-VA	Water	Free Cyanide in water by CFA	ASTM 7237
This analysis is carried out using procedures adapted from ASTM Method 7237 "Free Cyanide with Flow Injection Analysis (FIA) Utilizing Gas Diffusion Separation and Amperometric Detection". Free cyanide is determined by in-line gas diffusion at pH 6 with final determination by colourimetric analysis.			
CN-T-CFA-VA	Water	Total Cyanide in water by CFA	ISO 14403:2002
This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.			
CN-WAD-CFA-VA	Water	Weak Acid Diss. Cyanide in water by CFA	APHA 4500-CN CYANIDE
This analysis is carried out using procedures adapted from APHA Method 4500-CN I. "Weak Acid Dissociable Cyanide". Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.			
COL-TRU-ED	Water	Color, True	APHA 2120
True Colour is measured using a colorimeter by comparison to platinum-cobalt standards using the single wavelength method (450 - 465 nm) after filtration of sample through a 0.45 um filter. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Concurrent measurement of sample pH is recommended.			
ETL-HARDNESS-DIS-ED	Water	Hardness (from Dissolved Ca and Mg)	APHA 2340 B-Calculation
F-IC-N-ED	Water	Fluoride in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
HG-D-U-CVAF-VA	Water	Diss. Mercury in Water by CVAFS (Ultra)	APHA 3030 B / EPA 1631 REV. E
This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency (EPA). The procedure may involve preliminary sample treatment by filtration (APHA 3030B) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry.			
HG-T-U-CVAF-VA	Water	Total Mercury in Water by CVAFS (Ultra)	EPA 1631 REV. E
This analysis is carried out using procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry.			
IONBALANCE-ED	Water	Ion Balance Calculation	APHA 1030E
MET-D-CCMS-ED	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)
Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
MET-D-NP-U-CCMS-ED	Water	Diss. Metals in Water by CRC ICPMS (Ult)	APHA 3125-ICP-MS
Ultra trace metals in water are analyzed by ICPMS, based on US EPA Method 6020A (Jan 1998). This procedure is intended for pristine field-filtered acid-preserved water samples. ALS recommends that filtration blanks be submitted for this test to aid with interpretation of results.			
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.			
Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.			
MET-T-NP-U-CCMS-ED	Water	Metals in Water by CRC ICPMS (No Digest)	APHA 3125-ICP-MS
Ultra trace metals in water are analyzed by ICPMS, based on US EPA Method 6020A (Jan 1998). The detection limits provided can only be met for undigested samples. This procedure is intended for pristine, non-turbid, acid-preserved water samples, where sample turbidity is < 1 NTU. Where turbidity exceeds 1 NTU, results may be biased low compared to true Total Metals concentrations. ALS recommends that turbidity analysis be requested on samples submitted for this test to aid with interpretation of results.			
N-T-CALC-ED	Water	Total Nitrogen (Calculation)	APHA 4500 N-Calculated
Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)]			
N-TOTKJ-WP	Water	Total Kjeldahl Nitrogen	APHA 4500 NorgD (modified)
Aqueous samples are digested in a block digester with sulfuric acid and copper sulfate as a catalyst. Total Kjeldahl Nitrogen is then analyzed using a discrete analyzer with colorimetric detection.			
NH3-L-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)
This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.			
NO2-L-IC-N-ED	Water	Nitrite in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-L-IC-N-ED	Water	Nitrate in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
P-T-L-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
P-TD-L-COL-ED	Water	Total Dissolved P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Dissolved Phosphorous is determined colourimetrically after persulphate digestion of a sample that has been lab or field filtered through a 0.45 micron membrane filter.			
PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320
All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed). pH measurement is determined from the activity of the hydrogen ions using a hydrogen electrode and a reference electrode. Alkalinity measurement is based on the sample's capacity to neutralize acid. Auto-titration to pH 4.5 using 0.02N H_2SO_4 is performed. Conductivity measurement is based on the sample's capacity to convey an electric current, and is measured with a conductivity meter.			
PO4-DO-L-COL-ED	Water	Diss. Orthophosphate in Water 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.			
SILICATE-L-COL-ED	Water	Reactive Silica by Colour	APHA 4500-SiO_2 E.
This analysis is carried out using procedures adapted from APHA Method 4500-SiO_2 E. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.			
SO4-L-IC-N-ED	Water	Sulfate in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TDS-ED	Water	Total Dissolved Solids	APHA 2540 C
Gravimetric determination of solids in waters by filtration and evaporating filtrate to dryness at 180 degrees Celsius.			
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.			

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
SULPHIDE-CFA-ED	Water	Sulphide	APHA 4500 -S E-Auto-Colorimetry
A continuous flow manifold adds HCl to the sample which converts sulphide to a gas, then the sulphide is separated from the flow using a gas dialysis membrane. A colorimetric reaction produces a methylene blue compound which is measured at 660 nm. This follows the Standard Methods procedure 4500 S-E.			
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			

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

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

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

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

Workorder: L2113424 Report Date: 06-SEP-18

Client: GOLDER ASSOCIATES LTD
16820 107 Ave NW
EDMONTON AB T5P 4C3
Contact: Zenovia Craciunescu/Kerrie serben

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-DOC-HTC-WP	**Water**							
Batch R4115135								
WG2816760-2 LCS								
Dissolved Organic Carbon			102.5		%		80-120	06-JUL-18
WG2816760-6 LCS								
Dissolved Organic Carbon			102.3		%		80-120	06-JUL-18
WG2816760-1 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	06-JUL-18
WG2816760-5 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	06-JUL-18
Batch R4123090								
WG2820280-2 LCS								
Dissolved Organic Carbon			100.6		%		80-120	11-JUL-18
WG2820280-1 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	11-JUL-18
C-TOC-HTC-WP	**Water**							
Batch R4115132								
WG2816766-2 LCS								
Total Organic Carbon			103.3		%		80-120	06-JUL-18
WG2816766-6 LCS								
Total Organic Carbon			101.5		%		80-120	06-JUL-18
WG2816766-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	06-JUL-18
WG2816766-5 MB								
Total Organic Carbon			<0.50		mg/L		0.5	06-JUL-18
CL-IC-N-ED	**Water**							
Batch R4089694								
WG2801007-7 DUP		**L2113424-11**						
Chloride (Cl)		<0.50	<0.50	RPD-NA	mg/L	N/A	20	19-JUN-18
WG2801007-11 LCS								
Chloride (Cl)			102.3		%		90-110	19-JUN-18
WG2801007-13 LCS								
Chloride (Cl)			102.3		%		90-110	19-JUN-18
WG2801007-2 LCS								
Chloride (Cl)			101.0		%		90-110	19-JUN-18
WG2801007-9 LCS								
Chloride (Cl)			101.4		%		90-110	19-JUN-18
WG2801007-1 MB								
Chloride (Cl)			<0.50		mg/L		0.5	19-JUN-18
WG2801007-10 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-IC-N-ED	**Water**							
Batch R4089694								
WG2801007-10 MB								
Chloride (Cl)			<0.50		mg/L		0.5	19-JUN-18
WG2801007-12 MB								
Chloride (Cl)			<0.50		mg/L		0.5	19-JUN-18
WG2801007-14 MB								
Chloride (Cl)			<0.50		mg/L		0.5	19-JUN-18
WG2801007-8 MS		**L2113424-11**						
Chloride (Cl)			101.0		%		75-125	19-JUN-18
CN-FREE-CFA-VA	**Water**							
Batch R4095766								
WG2804993-12 LCS								
Cyanide, Free			97.7		%		80-120	22-JUN-18
WG2804993-7 LCS								
Cyanide, Free			96.5		%		80-120	22-JUN-18
WG2804993-11 MB								
Cyanide, Free			<0.0050		mg/L		0.005	22-JUN-18
WG2804993-6 MB								
Cyanide, Free			<0.0050		mg/L		0.005	22-JUN-18
Batch R4095858								
WG2805343-2 LCS								
Cyanide, Free			94.6		%		80-120	23-JUN-18
WG2805343-1 MB								
Cyanide, Free			<0.0050		mg/L		0.005	23-JUN-18
CN-T-CFA-VA	**Water**							
Batch R4094629								
WG2803413-2 LCS								
Cyanide, Total			95.6		%		80-120	21-JUN-18
WG2803413-1 MB								
Cyanide, Total			<0.0050		mg/L		0.005	21-JUN-18
Batch R4095766								
WG2804993-12 LCS								
Cyanide, Total			96.9		%		80-120	22-JUN-18
WG2804993-7 LCS								
Cyanide, Total			95.1		%		80-120	22-JUN-18
WG2804993-11 MB								
Cyanide, Total			<0.0050		mg/L		0.005	22-JUN-18
WG2804993-6 MB								
Cyanide, Total			<0.0050		mg/L		0.005	22-JUN-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-T-CFA-VA	**Water**							
Batch R4095858								
WG2805343-2 LCS								
Cyanide, Total			93.6		%		80-120	23-JUN-18
WG2805343-1 MB								
Cyanide, Total			<0.0050		mg/L		0.005	23-JUN-18
CN-WAD-CFA-VA	**Water**							
Batch R4095766								
WG2804993-12 LCS								
Cyanide, Weak Acid Diss			99.9		%		80-120	22-JUN-18
WG2804993-7 LCS								
Cyanide, Weak Acid Diss			97.6		%		80-120	22-JUN-18
WG2804993-11 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	22-JUN-18
WG2804993-6 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	22-JUN-18
Batch R4095858								
WG2805343-2 LCS								
Cyanide, Weak Acid Diss			97.1		%		80-120	23-JUN-18
WG2805343-1 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	23-JUN-18
COL-TRU-ED	**Water**							
Batch R4090022								
WG2801151-2 LCS								
Color, True			99.5		%		85-115	19-JUN-18
WG2801151-1 MB								
Color, True			<2.0		C.U.		2	19-JUN-18
F-IC-N-ED	**Water**							
Batch R4089694								
WG2801007-7 DUP		**L2113424-11**						
Fluoride (F)		<0.020	<0.020	RPD-NA	mg/L	N/A	20	19-JUN-18
WG2801007-11 LCS								
Fluoride (F)			106.9		%		90-110	19-JUN-18
WG2801007-13 LCS								
Fluoride (F)			106.0		%		90-110	19-JUN-18
WG2801007-2 LCS								
Fluoride (F)			102.2		%		90-110	19-JUN-18
WG2801007-9 LCS								
Fluoride (F)			104.1		%		90-110	19-JUN-18
WG2801007-1 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-ED	**Water**							
Batch R4089694								
WG2801007-1 MB								
Fluoride (F)			<0.020		mg/L		0.02	19-JUN-18
WG2801007-10 MB								
Fluoride (F)			<0.020		mg/L		0.02	19-JUN-18
WG2801007-12 MB								
Fluoride (F)			<0.020		mg/L		0.02	19-JUN-18
WG2801007-14 MB								
Fluoride (F)			<0.020		mg/L		0.02	19-JUN-18
WG2801007-8 MS		**L2113424-11**						
Fluoride (F)			103.8		%		75-125	19-JUN-18
HG-D-U-CVAF-VA	**Water**							
Batch R4114497								
WG2804538-3 DUP		**L2113424-2**						
Mercury (Hg)-Dissolved		0.00139	0.00129		ug/L	7.5	20	06-JUL-18
WG2804538-2 LCS								
Mercury (Hg)-Dissolved			108.6		%		80-120	06-JUL-18
WG2816077-2 LCS								
Mercury (Hg)-Dissolved			108.6		%		80-120	06-JUL-18
WG2804538-1 MB		**NP**						
Mercury (Hg)-Dissolved			<0.00050		ug/L		0.0005	06-JUL-18
WG2816077-1 MB								
Mercury (Hg)-Dissolved			<0.00050		ug/L		0.0005	06-JUL-18
WG2804538-4 MS		**L2113424-1**						
Mercury (Hg)-Dissolved			93.0		%		70-130	06-JUL-18
HG-T-U-CVAF-VA	**Water**							
Batch R4112757								
WG2814007-3 DUP		**L2113424-12**						
Mercury (Hg)-Total		<0.00050	<0.00050	RPD-NA	ug/L	N/A	20	04-JUL-18
WG2814007-2 LCS								
Mercury (Hg)-Total			102.4		%		80-120	04-JUL-18
WG2814007-1 MB								
Mercury (Hg)-Total			<0.00050		ug/L		0.0005	04-JUL-18
WG2814007-4 MS		**L2113424-1**						
Mercury (Hg)-Total			88.6		%		70-130	04-JUL-18
MET-D-CCMS-ED	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-ED	**Water**							
Batch	**R4132021**							
WG2811558-2	**LCS**							
Silicon (Si)-Dissolved			108.8		%		80-120	18-JUL-18
Sulfur (S)-Dissolved			105.4		%		80-120	18-JUL-18
Zirconium (Zr)-Dissolved			99.2		%		80-120	18-JUL-18
WG2811558-1	**MB**							
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	18-JUL-18
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	18-JUL-18
Zirconium (Zr)-Dissolved			<0.000060		mg/L		0.00006	18-JUL-18
MET-D-NP-U-CCMS-ED	**Water**							
Batch	**R4163587**							
WG2843941-3	**DUP**	**L2113424-13**						
Aluminum (Al)-Dissolved		<0.00030	<0.00030	RPD-NA	mg/L	N/A	20	08-AUG-18
Arsenic (As)-Dissolved		<0.000020	<0.000020	RPD-NA	mg/L	N/A	20	08-AUG-18
Barium (Ba)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	08-AUG-18
Beryllium (Be)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	08-AUG-18
Boron (B)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	08-AUG-18
Cadmium (Cd)-Dissolved		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	08-AUG-18
Calcium (Ca)-Dissolved		<0.020	<0.020	RPD-NA	mg/L	N/A	20	08-AUG-18
Chromium (Cr)-Dissolved		<0.000060	<0.000060	RPD-NA	mg/L	N/A	20	08-AUG-18
Cobalt (Co)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	08-AUG-18
Copper (Cu)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	08-AUG-18
Iron (Fe)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	08-AUG-18
Lead (Pb)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	08-AUG-18
Lithium (Li)-Dissolved		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	08-AUG-18
Magnesium (Mg)-Dissolved		<0.0040	<0.0040	RPD-NA	mg/L	N/A	20	08-AUG-18
Manganese (Mn)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	08-AUG-18
Molybdenum (Mo)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	08-AUG-18
Potassium (K)-Dissolved		<0.020	<0.020	RPD-NA	mg/L	N/A	20	08-AUG-18
Selenium (Se)-Dissolved		<0.000040	<0.000040	RPD-NA	mg/L	N/A	20	08-AUG-18
Silver (Ag)-Dissolved		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	08-AUG-18
Strontium (Sr)-Dissolved		<0.000050	0.000094	RPD-NA	mg/L	N/A	20	08-AUG-18
Thallium (Tl)-Dissolved		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	08-AUG-18
Tin (Sn)-Dissolved		<0.000050	0.000062	RPD-NA	mg/L	N/A	20	08-AUG-18
Titanium (Ti)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	08-AUG-18
Uranium (U)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	08-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch R4163587								
WG2843941-3 DUP		**L2113424-13**						
Zinc (Zn)-Dissolved		<0.00080	<0.00080	RPD-NA	mg/L	N/A	20	08-AUG-18
WG2843941-2 LCS								
Aluminum (Al)-Dissolved			103.5		%		80-120	08-AUG-18
Antimony (Sb)-Dissolved			95.9		%		80-120	08-AUG-18
Arsenic (As)-Dissolved			104.0		%		80-120	08-AUG-18
Barium (Ba)-Dissolved			105.0		%		80-120	08-AUG-18
Beryllium (Be)-Dissolved			100.6		%		80-120	08-AUG-18
Bismuth (Bi)-Dissolved			99.6		%		80-120	08-AUG-18
Boron (B)-Dissolved			103.9		%		80-120	08-AUG-18
Cadmium (Cd)-Dissolved			103.6		%		80-120	08-AUG-18
Calcium (Ca)-Dissolved			99.98		%		80-120	08-AUG-18
Chromium (Cr)-Dissolved			105.4		%		80-120	08-AUG-18
Cobalt (Co)-Dissolved			103.6		%		80-120	08-AUG-18
Copper (Cu)-Dissolved			103.7		%		80-120	08-AUG-18
Iron (Fe)-Dissolved			99.96		%		80-120	08-AUG-18
Lead (Pb)-Dissolved			100.0		%		80-120	08-AUG-18
Lithium (Li)-Dissolved			98.2		%		80-120	08-AUG-18
Magnesium (Mg)-Dissolved			105.2		%		80-120	08-AUG-18
Manganese (Mn)-Dissolved			109.9		%		80-120	08-AUG-18
Molybdenum (Mo)-Dissolved			97.9		%		80-120	08-AUG-18
Nickel (Ni)-Dissolved			103.8		%		80-120	08-AUG-18
Potassium (K)-Dissolved			105.6		%		80-120	08-AUG-18
Selenium (Se)-Dissolved			100.3		%		80-120	08-AUG-18
Silver (Ag)-Dissolved			98.9		%		80-120	08-AUG-18
Sodium (Na)-Dissolved			103.7		%		80-120	08-AUG-18
Strontium (Sr)-Dissolved			98.3		%		80-120	08-AUG-18
Thallium (Tl)-Dissolved			99.9		%		80-120	08-AUG-18
Tin (Sn)-Dissolved			98.3		%		80-120	08-AUG-18
Titanium (Ti)-Dissolved			105.1		%		80-120	08-AUG-18
Uranium (U)-Dissolved			100.4		%		80-120	08-AUG-18
Vanadium (V)-Dissolved			105.0		%		80-120	08-AUG-18
Zinc (Zn)-Dissolved			101.5		%		80-120	08-AUG-18
WG2843941-1 MB								
Antimony (Sb)-Dissolved			<0.000020		mg/L		0.00002	08-AUG-18
Arsenic (As)-Dissolved			<0.000020		mg/L		0.00002	08-AUG-18

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Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch R4163587								
WG2843941-1 MB								
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	08-AUG-18
Beryllium (Be)-Dissolved			<0.000010		mg/L		0.00001	08-AUG-18
Bismuth (Bi)-Dissolved			<0.000010		mg/L		0.00001	08-AUG-18
Boron (B)-Dissolved			<0.0010		mg/L		0.001	08-AUG-18
Cadmium (Cd)-Dissolved			<0.000005(		mg/L		0.000005	08-AUG-18
Calcium (Ca)-Dissolved			<0.020		mg/L		0.02	08-AUG-18
Chromium (Cr)-Dissolved			<0.000060		mg/L		0.00006	08-AUG-18
Cobalt (Co)-Dissolved			<0.000010		mg/L		0.00001	08-AUG-18
Copper (Cu)-Dissolved			<0.00010		mg/L		0.0001	08-AUG-18
Iron (Fe)-Dissolved			<0.0010		mg/L		0.001	08-AUG-18
Lead (Pb)-Dissolved			<0.000010		mg/L		0.00001	08-AUG-18
Lithium (Li)-Dissolved			<0.00050		mg/L		0.0005	08-AUG-18
Magnesium (Mg)-Dissolved			<0.0040		mg/L		0.004	08-AUG-18
Manganese (Mn)-Dissolved			<0.000050		mg/L		0.00005	08-AUG-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	08-AUG-18
Nickel (Ni)-Dissolved			<0.000060		mg/L		0.00006	08-AUG-18
Potassium (K)-Dissolved			<0.020		mg/L		0.02	08-AUG-18
Selenium (Se)-Dissolved			<0.000040		mg/L		0.00004	08-AUG-18
Silver (Ag)-Dissolved			<0.000005(		mg/L		0.000005	08-AUG-18
Sodium (Na)-Dissolved			<0.0050		mg/L		0.005	08-AUG-18
Strontium (Sr)-Dissolved			<0.000050		mg/L		0.00005	08-AUG-18
Thallium (Tl)-Dissolved			<0.000005(		mg/L		0.000005	08-AUG-18
Tin (Sn)-Dissolved			<0.000050		mg/L		0.00005	08-AUG-18
Titanium (Ti)-Dissolved			<0.00010		mg/L		0.0001	08-AUG-18
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	08-AUG-18
Zinc (Zn)-Dissolved			<0.00080		mg/L		0.0008	08-AUG-18
WG2843941-4 MS		**L2113424-13**						
Aluminum (Al)-Dissolved			101.6		%		70-130	08-AUG-18
Antimony (Sb)-Dissolved			109.8		%		70-130	08-AUG-18
Arsenic (As)-Dissolved			110.6		%		70-130	08-AUG-18
Barium (Ba)-Dissolved			104.4		%		70-130	08-AUG-18
Beryllium (Be)-Dissolved			103.5		%		70-130	08-AUG-18
Boron (B)-Dissolved			111.1		%		70-130	08-AUG-18
Cadmium (Cd)-Dissolved			112.7		%		70-130	08-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch R4163587								
WG2843941-4 MS		**L2113424-13**						
Calcium (Ca)-Dissolved			98.6		%		70-130	08-AUG-18
Chromium (Cr)-Dissolved			103.0		%		70-130	08-AUG-18
Cobalt (Co)-Dissolved			104.9		%		70-130	08-AUG-18
Copper (Cu)-Dissolved			106.4		%		70-130	08-AUG-18
Iron (Fe)-Dissolved			96.4		%		70-130	08-AUG-18
Lead (Pb)-Dissolved			98.2		%		70-130	08-AUG-18
Lithium (Li)-Dissolved			99.7		%		70-130	08-AUG-18
Magnesium (Mg)-Dissolved			103.6		%		70-130	08-AUG-18
Manganese (Mn)-Dissolved			107.0		%		70-130	08-AUG-18
Molybdenum (Mo)-Dissolved			99.1		%		70-130	08-AUG-18
Nickel (Ni)-Dissolved			105.8		%		70-130	08-AUG-18
Potassium (K)-Dissolved			103.6		%		70-130	08-AUG-18
Selenium (Se)-Dissolved			113.8		%		70-130	08-AUG-18
Silver (Ag)-Dissolved			108.7		%		70-130	08-AUG-18
Sodium (Na)-Dissolved			103.4		%		70-130	08-AUG-18
Strontium (Sr)-Dissolved			99.0		%		70-130	08-AUG-18
Thallium (Tl)-Dissolved			102.8		%		70-130	08-AUG-18
Tin (Sn)-Dissolved			105.8		%		70-130	08-AUG-18
Titanium (Ti)-Dissolved			116.2		%		70-130	08-AUG-18
Uranium (U)-Dissolved			102.2		%		70-130	08-AUG-18
Vanadium (V)-Dissolved			102.1		%		70-130	08-AUG-18
Zinc (Zn)-Dissolved			113.3		%		70-130	08-AUG-18
Batch R4168968								
WG2843941-3 DUP		**L2113424-13**						
Antimony (Sb)-Dissolved		<0.000020	<0.000020	RPD-NA	mg/L	N/A	20	13-AUG-18
Bismuth (Bi)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	13-AUG-18
Nickel (Ni)-Dissolved		<0.000060	<0.000060	RPD-NA	mg/L	N/A	20	13-AUG-18
Sodium (Na)-Dissolved		0.0240	0.0237		mg/L	1.4	20	13-AUG-18
Vanadium (V)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	13-AUG-18
WG2843941-1 MB								
Aluminum (Al)-Dissolved			<0.00030		mg/L		0.0003	13-AUG-18
Vanadium (V)-Dissolved			<0.000050		mg/L		0.00005	13-AUG-18
MET-T-CCMS-ED	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-ED	**Water**							
Batch R4095377								
WG2804424-2 LCS		**HB_WATER**						
Silicon (Si)-Total			106.5		%		80-120	22-JUN-18
Sulfur (S)-Total			109.7		%		80-120	22-JUN-18
Zirconium (Zr)-Total			103.0		%		80-120	22-JUN-18
WG2804424-1 MB								
Silicon (Si)-Total			<0.10		mg/L		0.1	22-JUN-18
Sulfur (S)-Total			<0.50		mg/L		0.5	22-JUN-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	22-JUN-18
Batch R4138407								
WG2804424-2 LCS		**HB_WATER**						
Silicon (Si)-Total			121.5	MES	%		80-120	23-JUL-18
Sulfur (S)-Total			110.9		%		80-120	23-JUL-18
Zirconium (Zr)-Total			109.7		%		80-120	23-JUL-18
WG2804424-1 MB								
Silicon (Si)-Total			<0.10		mg/L		0.1	23-JUL-18
Sulfur (S)-Total			<0.50		mg/L		0.5	23-JUL-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	23-JUL-18
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4163649								
WG2844151-3 DUP		**L2113424-13**						
Aluminum (Al)-Total		<0.0012	<0.0012	RPD-NA	mg/L	N/A	20	08-AUG-18
Antimony (Sb)-Total		<0.000020	<0.000020	RPD-NA	mg/L	N/A	20	08-AUG-18
Arsenic (As)-Total		<0.000020	<0.000020	RPD-NA	mg/L	N/A	20	08-AUG-18
Barium (Ba)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	08-AUG-18
Beryllium (Be)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	08-AUG-18
Bismuth (Bi)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	08-AUG-18
Boron (B)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	08-AUG-18
Cadmium (Cd)-Total		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	08-AUG-18
Chromium (Cr)-Total		<0.000060	<0.000060	RPD-NA	mg/L	N/A	20	08-AUG-18
Cobalt (Co)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	08-AUG-18
Copper (Cu)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	08-AUG-18
Iron (Fe)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	25	08-AUG-18
Lead (Pb)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	08-AUG-18
Lithium (Li)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	08-AUG-18
Manganese (Mn)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	08-AUG-18
Molybdenum (Mo)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	08-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4163649								
WG2844151-3 DUP		**L2113424-13**						
Nickel (Ni)-Total		0.000102	0.000094		mg/L	8.2	20	08-AUG-18
Selenium (Se)-Total		<0.000040	<0.000040	RPD-NA	mg/L	N/A	20	08-AUG-18
Silver (Ag)-Total		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	08-AUG-18
Strontium (Sr)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	08-AUG-18
Thallium (Tl)-Total		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	08-AUG-18
Tin (Sn)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	08-AUG-18
Titanium (Ti)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	08-AUG-18
Uranium (U)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	08-AUG-18
Vanadium (V)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	08-AUG-18
Zinc (Zn)-Total		<0.00080	<0.00080	RPD-NA	mg/L	N/A	20	08-AUG-18
WG2844151-2 LCS								
Aluminum (Al)-Total			105.0		%		80-120	08-AUG-18
Antimony (Sb)-Total			98.1		%		80-120	08-AUG-18
Arsenic (As)-Total			105.6		%		80-120	08-AUG-18
Barium (Ba)-Total			104.3		%		80-120	08-AUG-18
Beryllium (Be)-Total			103.4		%		80-120	08-AUG-18
Bismuth (Bi)-Total			105.8		%		80-120	08-AUG-18
Boron (B)-Total			103.2		%		80-120	08-AUG-18
Cadmium (Cd)-Total			104.1		%		80-120	08-AUG-18
Chromium (Cr)-Total			105.3		%		80-120	08-AUG-18
Cobalt (Co)-Total			104.7		%		80-120	08-AUG-18
Copper (Cu)-Total			105.7		%		80-120	08-AUG-18
Iron (Fe)-Total			102.1		%		80-120	08-AUG-18
Lead (Pb)-Total			106.6		%		80-120	08-AUG-18
Lithium (Li)-Total			99.7		%		80-120	08-AUG-18
Manganese (Mn)-Total			105.8		%		80-120	08-AUG-18
Molybdenum (Mo)-Total			99.8		%		80-120	08-AUG-18
Nickel (Ni)-Total			105.2		%		80-120	08-AUG-18
Selenium (Se)-Total			100.6		%		80-120	08-AUG-18
Silver (Ag)-Total			101.5		%		80-120	08-AUG-18
Strontium (Sr)-Total			101.1		%		80-120	08-AUG-18
Thallium (Tl)-Total			105.6		%		80-120	08-AUG-18
Tin (Sn)-Total			100.7		%		80-120	08-AUG-18
Titanium (Ti)-Total			106.9		%		80-120	08-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4163649								
WG2844151-2 LCS								
Uranium (U)-Total			104.7		%		80-120	08-AUG-18
Vanadium (V)-Total			105.8		%		80-120	08-AUG-18
Zinc (Zn)-Total			104.8		%		80-120	08-AUG-18
WG2844151-1 MB								
Aluminum (Al)-Total			<0.00030		mg/L		0.0003	08-AUG-18
Antimony (Sb)-Total			<0.000020		mg/L		0.00002	08-AUG-18
Arsenic (As)-Total			<0.000020		mg/L		0.00002	08-AUG-18
Barium (Ba)-Total			<0.000050		mg/L		0.00005	08-AUG-18
Beryllium (Be)-Total			<0.000010		mg/L		0.00001	08-AUG-18
Bismuth (Bi)-Total			<0.000010		mg/L		0.00001	08-AUG-18
Boron (B)-Total			<0.0010		mg/L		0.001	08-AUG-18
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	08-AUG-18
Chromium (Cr)-Total			<0.000060		mg/L		0.00006	08-AUG-18
Cobalt (Co)-Total			<0.000010		mg/L		0.00001	08-AUG-18
Copper (Cu)-Total			<0.00010		mg/L		0.0001	08-AUG-18
Iron (Fe)-Total			<0.0010		mg/L		0.001	08-AUG-18
Lead (Pb)-Total			<0.000010		mg/L		0.00001	08-AUG-18
Lithium (Li)-Total			<0.00050		mg/L		0.0005	08-AUG-18
Manganese (Mn)-Total			<0.000050		mg/L		0.00005	08-AUG-18
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	08-AUG-18
Nickel (Ni)-Total			<0.000060		mg/L		0.00006	08-AUG-18
Selenium (Se)-Total			<0.000040		mg/L		0.00004	08-AUG-18
Silver (Ag)-Total			<0.0000050		mg/L		0.000005	08-AUG-18
Strontium (Sr)-Total			<0.000050		mg/L		0.00005	08-AUG-18
Thallium (Tl)-Total			<0.0000050		mg/L		0.000005	08-AUG-18
Tin (Sn)-Total			<0.000050		mg/L		0.00005	08-AUG-18
Titanium (Ti)-Total			<0.00010		mg/L		0.0001	08-AUG-18
Uranium (U)-Total			<0.000010		mg/L		0.00001	08-AUG-18
Vanadium (V)-Total			0.000088	MB-LOR	mg/L		0.00005	08-AUG-18
Zinc (Zn)-Total			<0.00080		mg/L		0.0008	08-AUG-18
WG2844151-4 MS		**L2113424-13**						
Aluminum (Al)-Total			100.7		%		70-130	08-AUG-18
Antimony (Sb)-Total			109.8		%		70-130	08-AUG-18
Arsenic (As)-Total			108.6		%		70-130	08-AUG-18
Barium (Ba)-Total			104.1		%		70-130	08-AUG-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4163649								
WG2844151-4 MS		**L2113424-13**						
Beryllium (Be)-Total			107.5		%		70-130	08-AUG-18
Bismuth (Bi)-Total			76.0		%		70-130	08-AUG-18
Boron (B)-Total			112.0		%		70-130	08-AUG-18
Cadmium (Cd)-Total			115.0		%		70-130	08-AUG-18
Chromium (Cr)-Total			101.8		%		70-130	08-AUG-18
Cobalt (Co)-Total			103.2		%		70-130	08-AUG-18
Copper (Cu)-Total			107.5		%		70-130	08-AUG-18
Iron (Fe)-Total			100.3		%		70-130	08-AUG-18
Lead (Pb)-Total			103.4		%		70-130	08-AUG-18
Lithium (Li)-Total			101.1		%		70-130	08-AUG-18
Manganese (Mn)-Total			105.4		%		70-130	08-AUG-18
Molybdenum (Mo)-Total			102.6		%		70-130	08-AUG-18
Nickel (Ni)-Total			104.5		%		70-130	08-AUG-18
Selenium (Se)-Total			115.1		%		70-130	08-AUG-18
Silver (Ag)-Total			115.6		%		70-130	08-AUG-18
Strontium (Sr)-Total			102.2		%		70-130	08-AUG-18
Thallium (Tl)-Total			106.5		%		70-130	08-AUG-18
Tin (Sn)-Total			105.6		%		70-130	08-AUG-18
Titanium (Ti)-Total			109.9		%		70-130	08-AUG-18
Uranium (U)-Total			105.2		%		70-130	08-AUG-18
Vanadium (V)-Total			102.1		%		70-130	08-AUG-18
Zinc (Zn)-Total			110.8		%		70-130	08-AUG-18
Batch R4170096								
WG2849330-2 LCS								
Antimony (Sb)-Total			101.7		%		80-120	14-AUG-18
Arsenic (As)-Total			99.5		%		80-120	14-AUG-18
Barium (Ba)-Total			101.6		%		80-120	14-AUG-18
Beryllium (Be)-Total			101.7		%		80-120	14-AUG-18
Bismuth (Bi)-Total			101.6		%		80-120	14-AUG-18
Boron (B)-Total			118.4		%		80-120	14-AUG-18
Cadmium (Cd)-Total			97.5		%		80-120	14-AUG-18
Chromium (Cr)-Total			100.8		%		80-120	14-AUG-18
Cobalt (Co)-Total			100.9		%		80-120	14-AUG-18
Copper (Cu)-Total			99.5		%		80-120	14-AUG-18

[redacted]

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4170096								
WG2849330-2 LCS								
Iron (Fe)-Total			100.2		%		80-120	14-AUG-18
Lead (Pb)-Total			103.9		%		80-120	14-AUG-18
Lithium (Li)-Total			99.3		%		80-120	14-AUG-18
Manganese (Mn)-Total			100.6		%		80-120	14-AUG-18
Molybdenum (Mo)-Total			100.7		%		80-120	14-AUG-18
Nickel (Ni)-Total			100.0		%		80-120	14-AUG-18
Silver (Ag)-Total			104.5		%		80-120	14-AUG-18
Strontium (Sr)-Total			97.0		%		80-120	14-AUG-18
Thallium (Tl)-Total			104.3		%		80-120	14-AUG-18
Tin (Sn)-Total			100.6		%		80-120	14-AUG-18
Titanium (Ti)-Total			103.3		%		80-120	14-AUG-18
Uranium (U)-Total			101.8		%		80-120	14-AUG-18
Vanadium (V)-Total			101.0		%		80-120	14-AUG-18
Zinc (Zn)-Total			98.2		%		80-120	14-AUG-18
WG2849330-1 MB								
Antimony (Sb)-Total			<0.000020		mg/L		0.00002	14-AUG-18
Arsenic (As)-Total			<0.000020		mg/L		0.00002	14-AUG-18
Barium (Ba)-Total			<0.000050		mg/L		0.00005	14-AUG-18
Beryllium (Be)-Total			<0.000010		mg/L		0.00001	14-AUG-18
Bismuth (Bi)-Total			<0.000010		mg/L		0.00001	14-AUG-18
Cadmium (Cd)-Total			<0.000005(		mg/L		0.000005	14-AUG-18
Chromium (Cr)-Total			<0.000060		mg/L		0.00006	14-AUG-18
Cobalt (Co)-Total			<0.000010		mg/L		0.00001	14-AUG-18
Copper (Cu)-Total			<0.00010		mg/L		0.0001	14-AUG-18
Iron (Fe)-Total			<0.0010		mg/L		0.001	14-AUG-18
Lead (Pb)-Total			<0.000010		mg/L		0.00001	14-AUG-18
Lithium (Li)-Total			<0.00050		mg/L		0.0005	14-AUG-18
Manganese (Mn)-Total			<0.000050		mg/L		0.00005	14-AUG-18
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	14-AUG-18
Nickel (Ni)-Total			<0.000060		mg/L		0.00006	14-AUG-18
Silver (Ag)-Total			<0.000005(		mg/L		0.000005	14-AUG-18
Strontium (Sr)-Total			<0.000050		mg/L		0.00005	14-AUG-18
Thallium (Tl)-Total			<0.000005(		mg/L		0.000005	14-AUG-18
Tin (Sn)-Total			<0.000050		mg/L		0.00005	14-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4170096								
WG2849330-1 MB								
Titanium (Ti)-Total			<0.00010		mg/L		0.0001	14-AUG-18
Uranium (U)-Total			<0.000010		mg/L		0.00001	14-AUG-18
Vanadium (V)-Total			<0.000050		mg/L		0.00005	14-AUG-18
Zinc (Zn)-Total			<0.00080		mg/L		0.0008	14-AUG-18
N-TOTKJ-WP	**Water**							
Batch R4122498								
WG2817161-11 DUP		**L2113424-2**						
Total Kjeldahl Nitrogen		0.25	0.24		mg/L	3.2	20	11-JUL-18
WG2817161-10 LCS								
Total Kjeldahl Nitrogen			111.6		%		75-125	11-JUL-18
WG2817161-2 LCS								
Total Kjeldahl Nitrogen			101.3		%		75-125	11-JUL-18
WG2817161-1 MB								
Total Kjeldahl Nitrogen			<0.20		mg/L		0.2	11-JUL-18
WG2817161-9 MB								
Total Kjeldahl Nitrogen			<0.20		mg/L		0.2	11-JUL-18
WG2817161-12 MS		**L2113424-2**						
Total Kjeldahl Nitrogen			103.7		%		70-130	11-JUL-18
NH3-L-CFA-ED	**Water**							
Batch R4107167								
WG2811537-2 LCS								
Ammonia, Total (as N)			105.4		%		85-115	28-JUN-18
WG2811537-1 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	28-JUN-18
NO2-L-IC-N-ED	**Water**							
Batch R4089694								
WG2801007-7 DUP		**L2113424-11**						
Nitrite (as N)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	19-JUN-18
WG2801007-11 LCS								
Nitrite (as N)			104.9		%		90-110	19-JUN-18
WG2801007-13 LCS								
Nitrite (as N)			104.7		%		90-110	19-JUN-18
WG2801007-2 LCS								
Nitrite (as N)			104.2		%		90-110	19-JUN-18
WG2801007-9 LCS								
Nitrite (as N)			104.2		%		90-110	19-JUN-18
WG2801007-1 MB								

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-L-IC-N-ED	**Water**							
Batch R4089694								
WG2801007-1 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	19-JUN-18
WG2801007-10 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	19-JUN-18
WG2801007-12 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	19-JUN-18
WG2801007-14 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	19-JUN-18
WG2801007-8 MS		**L2113424-11**						
Nitrite (as N)			103.8		%		75-125	19-JUN-18
NO3-L-IC-N-ED	**Water**							
Batch R4089694								
WG2801007-7 DUP		**L2113424-11**						
Nitrate (as N)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	19-JUN-18
WG2801007-11 LCS								
Nitrate (as N)			99.2		%		90-110	19-JUN-18
WG2801007-13 LCS								
Nitrate (as N)			99.0		%		90-110	19-JUN-18
WG2801007-2 LCS								
Nitrate (as N)			98.6		%		90-110	19-JUN-18
WG2801007-9 LCS								
Nitrate (as N)			99.3		%		90-110	19-JUN-18
WG2801007-1 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	19-JUN-18
WG2801007-10 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	19-JUN-18
WG2801007-12 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	19-JUN-18
WG2801007-14 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	19-JUN-18
WG2801007-8 MS		**L2113424-11**						
Nitrate (as N)			97.8		%		75-125	19-JUN-18
Batch R4097518								
WG2804997-15 LCS								
Nitrate (as N)			103.0		%		90-110	22-JUN-18
WG2804997-17 LCS								
Nitrate (as N)			103.9		%		90-110	22-JUN-18
WG2804997-19 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-L-IC-N-ED	**Water**							
Batch R4097518								
WG2804997-19 LCS								
Nitrate (as N)			102.6		%		90-110	22-JUN-18
WG2804997-2 LCS								
Nitrate (as N)			102.2		%		90-110	22-JUN-18
WG2804997-21 LCS								
Nitrate (as N)			102.9		%		90-110	22-JUN-18
WG2804997-1 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	22-JUN-18
WG2804997-16 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	22-JUN-18
WG2804997-18 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	22-JUN-18
WG2804997-20 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	22-JUN-18
WG2804997-22 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	22-JUN-18
P-T-L-COL-ED	**Water**							
Batch R4123785								
WG2819524-10 LCS								
Phosphorus (P)-Total			103.4		%		80-120	12-JUL-18
WG2819524-9 MB								
Phosphorus (P)-Total			<0.0010		mg/L		0.001	12-JUL-18
Batch R4125168								
WG2822250-10 LCS								
Phosphorus (P)-Total			99.6		%		80-120	14-JUL-18
WG2822250-9 MB								
Phosphorus (P)-Total			<0.0010		mg/L		0.001	14-JUL-18
P-TD-L-COL-ED	**Water**							
Batch R4123785								
WG2819524-10 LCS								
Phosphorus (P)-Total	Dissolved		103.4		%		80-120	12-JUL-18
WG2819524-9 MB								
Phosphorus (P)-Total	Dissolved		<0.0010		mg/L		0.001	12-JUL-18
Batch R4125168								
WG2822250-10 LCS								
Phosphorus (P)-Total	Dissolved		99.6		%		80-120	14-JUL-18
WG2822250-9 MB								
Phosphorus (P)-Total	Dissolved		<0.0010		mg/L		0.001	14-JUL-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R4112556								
WG2813752-36 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			88.8		%		85-115	04-JUL-18
WG2813752-4 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			93.5		%		85-115	04-JUL-18
WG2813752-41 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			90.0		%		85-115	04-JUL-18
WG2813752-46 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			91.4		%		85-115	04-JUL-18
WG2813752-51 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			89.6		%		85-115	04-JUL-18
WG2813752-56 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			94.7		%		85-115	04-JUL-18
WG2813752-61 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			91.8		%		85-115	04-JUL-18
WG2813752-66 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			89.7		%		85-115	04-JUL-18
WG2813752-71 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			89.7		%		85-115	04-JUL-18
WG2813752-1 MB								
Conductivity (EC)			<2.0		uS/cm		2	04-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	04-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	04-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	04-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	04-JUL-18
WG2813752-33 MB								
Conductivity (EC)			<2.0		uS/cm		2	04-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	04-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	04-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	04-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	04-JUL-18
WG2813752-38 MB								
Conductivity (EC)			<2.0		uS/cm		2	04-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	04-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	04-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	04-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	04-JUL-18
WG2813752-43 MB								
Conductivity (EC)			<2.0		uS/cm		2	04-JUL-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R4112556								
WG2813752-43 MB								
Bicarbonate (HCO3)			<5.0		mg/L		5	04-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	04-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	04-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	04-JUL-18
WG2813752-48 MB								
Conductivity (EC)			<2.0		uS/cm		2	04-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	04-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	04-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	04-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	04-JUL-18
WG2813752-53 MB								
Conductivity (EC)			<2.0		uS/cm		2	04-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	04-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	04-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	04-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	04-JUL-18
WG2813752-58 MB								
Conductivity (EC)			<2.0		uS/cm		2	04-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	04-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	04-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	04-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	04-JUL-18
WG2813752-63 MB								
Conductivity (EC)			<2.0		uS/cm		2	04-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	04-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	04-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	04-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	04-JUL-18
WG2813752-68 MB								
Conductivity (EC)			<2.0		uS/cm		2	04-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	04-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	04-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	04-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	04-JUL-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R4117327								
WG2817615-4 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			98.8		%		85-115	09-JUL-18
WG2817615-47 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			99.7		%		85-115	09-JUL-18
WG2817615-52 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			101.6		%		85-115	09-JUL-18
WG2817615-57 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			102.0		%		85-115	09-JUL-18
WG2817615-62 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			100.6		%		85-115	09-JUL-18
WG2817615-67 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			100.8		%		85-115	09-JUL-18
WG2817615-72 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			99.7		%		85-115	09-JUL-18
WG2817615-77 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			99.8		%		85-115	09-JUL-18
WG2817615-82 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			99.96		%		85-115	09-JUL-18
WG2817615-1 MB								
Conductivity (EC)			<2.0		uS/cm		2	09-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	09-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	09-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	09-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	09-JUL-18
WG2817615-44 MB								
Conductivity (EC)			<2.0		uS/cm		2	09-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	09-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	09-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	09-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	09-JUL-18
WG2817615-49 MB								
Conductivity (EC)			<2.0		uS/cm		2	09-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	09-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	09-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	09-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	09-JUL-18
WG2817615-54 MB								
Conductivity (EC)			<2.0		uS/cm		2	09-JUL-18

[redacted]

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R4117327								
WG2817615-54 MB								
Bicarbonate (HCO3)			<5.0		mg/L		5	09-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	09-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	09-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	09-JUL-18
WG2817615-59 MB								
Conductivity (EC)			<2.0		uS/cm		2	09-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	09-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	09-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	09-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	09-JUL-18
WG2817615-64 MB								
Conductivity (EC)			<2.0		uS/cm		2	09-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	09-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	09-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	09-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	09-JUL-18
WG2817615-69 MB								
Conductivity (EC)			<2.0		uS/cm		2	09-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	09-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	09-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	09-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	09-JUL-18
WG2817615-74 MB								
Conductivity (EC)			<2.0		uS/cm		2	09-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	09-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	09-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	09-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	09-JUL-18
WG2817615-79 MB								
Conductivity (EC)			<2.0		uS/cm		2	09-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	09-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	09-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	09-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	09-JUL-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R4123737								
WG2820961-10 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			100.1		%		85-115	12-JUL-18
WG2820961-15 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			101.6		%		85-115	12-JUL-18
WG2820961-20 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			102.9		%		85-115	12-JUL-18
WG2820961-25 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			100.8		%		85-115	12-JUL-18
WG2820961-35 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			99.9		%		85-115	12-JUL-18
WG2820961-4 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			99.9		%		85-115	12-JUL-18
WG2820961-1 MB								
Conductivity (EC)			<2.0		uS/cm		2	12-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	12-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	12-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	12-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	12-JUL-18
WG2820961-12 MB								
Conductivity (EC)			<2.0		uS/cm		2	12-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	12-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	12-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	12-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	12-JUL-18
WG2820961-17 MB								
Conductivity (EC)			<2.0		uS/cm		2	12-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	12-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	12-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	12-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	12-JUL-18
WG2820961-22 MB								
Conductivity (EC)			<2.0		uS/cm		2	12-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	12-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	12-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	12-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	12-JUL-18
WG2820961-27 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R4123737								
WG2820961-27 MB								
Conductivity (EC)			<2.0		uS/cm		2	12-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	12-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	12-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	12-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	12-JUL-18
WG2820961-32 MB								
Conductivity (EC)			<2.0		uS/cm		2	12-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	12-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	12-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	12-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	12-JUL-18
WG2820961-7 MB								
Conductivity (EC)			<2.0		uS/cm		2	12-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	12-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	12-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	12-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	12-JUL-18
PO4-DO-L-COL-ED	**Water**							
Batch R4090070								
WG2800995-4 DUP		**L2113424-1**						
Orthophosphate-Dissolved (as P)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	19-JUN-18
WG2800995-2 LCS								
Orthophosphate-Dissolved (as P)			95.8		%		80-120	19-JUN-18
WG2800995-1 MB								
Orthophosphate-Dissolved (as P)			<0.0010		mg/L		0.001	19-JUN-18
WG2800995-3 MS		**L2113424-1**						
Orthophosphate-Dissolved (as P)			97.6		%		70-130	19-JUN-18
SILICATE-L-COL-ED	**Water**							
Batch R4095492								
WG2804947-3 DUP		**L2113424-11**						
Silicate (as SiO2)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	22-JUN-18
WG2804947-2 LCS								
Silicate (as SiO2)			109.2		%		85-115	22-JUN-18
WG2804947-1 MB								
Silicate (as SiO2)			<0.010		mg/L		0.01	22-JUN-18
WG2804947-4 MS		**L2113424-11**						

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SILICATE-L-COL-ED	**Water**							
Batch R4095492								
WG2804947-4 MS		**L2113424-11**						
Silicate (as SiO2)			105.6		%		80-120	22-JUN-18
SO4-L-IC-N-ED	**Water**							
Batch R4089694								
WG2801007-7 DUP		**L2113424-11**						
Sulfate (SO4)		<0.050	<0.050	RPD-NA	mg/L	N/A	20	19-JUN-18
WG2801007-11 LCS								
Sulfate (SO4)			103.5		%		90-110	19-JUN-18
WG2801007-13 LCS								
Sulfate (SO4)			103.4		%		90-110	19-JUN-18
WG2801007-2 LCS								
Sulfate (SO4)			101.8		%		90-110	19-JUN-18
WG2801007-9 LCS								
Sulfate (SO4)			102.7		%		90-110	19-JUN-18
WG2801007-1 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	19-JUN-18
WG2801007-10 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	19-JUN-18
WG2801007-12 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	19-JUN-18
WG2801007-14 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	19-JUN-18
WG2801007-8 MS		**L2113424-11**						
Sulfate (SO4)			102.7		%		75-125	19-JUN-18
SOLIDS-TDS-ED	**Water**							
Batch R4091588								
WG2801194-2 LCS								
Total Dissolved Solids			95.9		%		85-115	19-JUN-18
WG2801194-1 MB								
Total Dissolved Solids			<10		mg/L		10	19-JUN-18
Batch R4095129								
WG2803027-2 LCS								
Total Dissolved Solids			99.5		%		85-115	21-JUN-18
WG2803027-1 MB								
Total Dissolved Solids			<10		mg/L		10	21-JUN-18
SOLIDS-TOTSUS-ED	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TOTSUS-ED	**Water**							
Batch R4094314								
WG2803015-2 LCS								
Total Suspended Solids			103.4		%		85-115	21-JUN-18
WG2803015-1 MB								
Total Suspended Solids			<3.0		mg/L		3	21-JUN-18
SULPHIDE-CFA-ED	**Water**							
Batch R4086790								
WG2800184-25 DUP		**L2113424-13**						
Sulphide (as S)		<0.0015	<0.0015	RPD-NA	mg/L	N/A	20	18-JUN-18
WG2800184-10 LCS								
Sulphide (as S)			101.3		%		75-125	18-JUN-18
WG2800184-14 LCS								
Sulphide (as S)			91.5		%		75-125	18-JUN-18
WG2800184-18 LCS								
Sulphide (as S)			93.1		%		75-125	18-JUN-18
WG2800184-22 LCS								
Sulphide (as S)			81.5		%		75-125	18-JUN-18
WG2800184-6 LCS								
Sulphide (as S)			79.9		%		75-125	18-JUN-18
WG2800184-13 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	18-JUN-18
WG2800184-17 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	18-JUN-18
WG2800184-21 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	18-JUN-18
WG2800184-5 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	18-JUN-18
WG2800184-9 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	18-JUN-18
WG2800184-26 MS		**L2113424-13**						
Sulphide (as S)			69.2		%		65-135	18-JUN-18
TURBIDITY-ED	**Water**							
Batch R4090243								
WG2801156-2 LCS								
Turbidity			97.3		%		95-105	19-JUN-18
WG2801156-1 MB								
Turbidity			<0.10		NTU		0.1	19-JUN-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
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).
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							
Color, True							
	1	11-JUN-18 08:45	19-JUN-18 13:00	3	8	days	EHTR
	2	11-JUN-18 09:00	19-JUN-18 13:00	3	8	days	EHTR
	3	11-JUN-18 09:10	19-JUN-18 13:00	3	8	days	EHTR
	4	11-JUN-18 09:20	19-JUN-18 13:00	3	8	days	EHTR
	5	11-JUN-18 10:45	19-JUN-18 13:00	3	8	days	EHTR
	6	11-JUN-18 11:15	19-JUN-18 13:00	3	8	days	EHTR
	7	11-JUN-18 12:45	19-JUN-18 13:00	3	8	days	EHTR
	8	11-JUN-18 13:00	19-JUN-18 13:00	3	8	days	EHTR
	9	11-JUN-18 13:30	19-JUN-18 13:00	3	8	days	EHTR
	10	11-JUN-18 14:00	19-JUN-18 13:00	3	8	days	EHTR
	11	11-JUN-18 15:00	19-JUN-18 13:00	3	8	days	EHTR
	13	12-JUN-18 08:30	19-JUN-18 13:00	3	7	days	EHTR
Total Dissolved Solids							
	1	11-JUN-18 08:45	19-JUN-18 00:00	7	8	days	EHT
	2	11-JUN-18 09:00	19-JUN-18 00:00	7	8	days	EHT
	3	11-JUN-18 09:10	21-JUN-18 00:00	7	10	days	EHT
	4	11-JUN-18 09:20	21-JUN-18 00:00	7	10	days	EHT
	5	11-JUN-18 10:45	21-JUN-18 00:00	7	10	days	EHT
	6	11-JUN-18 11:15	21-JUN-18 00:00	7	10	days	EHT
	7	11-JUN-18 12:45	21-JUN-18 00:00	7	9	days	EHT
	8	11-JUN-18 13:00	21-JUN-18 00:00	7	9	days	EHT
	9	11-JUN-18 13:30	21-JUN-18 00:00	7	9	days	EHT
	10	11-JUN-18 14:00	21-JUN-18 00:00	7	9	days	EHT
	11	11-JUN-18 15:00	21-JUN-18 00:00	7	9	days	EHT
	13	12-JUN-18 08:30	21-JUN-18 00:00	7	9	days	EHT
Total Suspended Solids							
	1	11-JUN-18 08:45	21-JUN-18 00:00	7	10	days	EHT
	2	11-JUN-18 09:00	21-JUN-18 00:00	7	10	days	EHT
	3	11-JUN-18 09:10	21-JUN-18 00:00	7	10	days	EHT
	4	11-JUN-18 09:20	21-JUN-18 00:00	7	10	days	EHT
	5	11-JUN-18 10:45	21-JUN-18 00:00	7	10	days	EHT
	6	11-JUN-18 11:15	21-JUN-18 00:00	7	10	days	EHT
	7	11-JUN-18 12:45	21-JUN-18 00:00	7	9	days	EHT
	8	11-JUN-18 13:00	21-JUN-18 00:00	7	9	days	EHT
	9	11-JUN-18 13:30	21-JUN-18 00:00	7	9	days	EHT
	10	11-JUN-18 14:00	21-JUN-18 00:00	7	9	days	EHT
	11	11-JUN-18 15:00	21-JUN-18 00:00	7	9	days	EHT
	13	12-JUN-18 08:30	21-JUN-18 00:00	7	9	days	EHT
Turbidity							
	1	11-JUN-18 08:45	19-JUN-18 18:49	3	8	days	EHTR
	2	11-JUN-18 09:00	19-JUN-18 18:49	3	8	days	EHTR
	3	11-JUN-18 09:10	19-JUN-18 18:49	3	8	days	EHTR
	4	11-JUN-18 09:20	19-JUN-18 18:49	3	8	days	EHTR
	5	11-JUN-18 10:45	19-JUN-18 18:49	3	8	days	EHTR
	6	11-JUN-18 11:15	19-JUN-18 18:49	3	8	days	EHTR
	7	11-JUN-18 12:45	19-JUN-18 18:49	3	8	days	EHTR
	8	11-JUN-18 13:00	19-JUN-18 18:49	3	8	days	EHTR
	9	11-JUN-18 13:30	19-JUN-18 18:49	3	8	days	EHTR
	10	11-JUN-18 14:00	19-JUN-18 18:49	3	8	days	EHTR
	11	11-JUN-18 15:00	19-JUN-18 18:49	3	8	days	EHTR
	13	12-JUN-18 08:30	19-JUN-18 18:49	3	7	days	EHTR
Leachable Anions & Nutrients							
Diss. Orthophosphate in Water by Colour							
	1	11-JUN-18 08:45	19-JUN-18 00:00	3	8	days	EHTR
	2	11-JUN-18 09:00	19-JUN-18 00:00	3	8	days	EHTR
	3	11-JUN-18 09:10	19-JUN-18 00:00	3	8	days	EHTR

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Leachable Anions & Nutrients							
Diss. Orthophosphate in Water by Colour							
	4	11-JUN-18 09:20	19-JUN-18 00:00	3	8	days	EHTR
	5	11-JUN-18 10:45	19-JUN-18 00:00	3	8	days	EHTR
	6	11-JUN-18 11:15	19-JUN-18 00:00	3	8	days	EHTR
	7	11-JUN-18 12:45	19-JUN-18 00:00	3	7	days	EHTR
	8	11-JUN-18 13:00	19-JUN-18 00:00	3	7	days	EHTR
	9	11-JUN-18 13:30	19-JUN-18 00:00	3	7	days	EHTR
	10	11-JUN-18 14:00	19-JUN-18 00:00	3	7	days	EHTR
	11	11-JUN-18 15:00	19-JUN-18 00:00	3	7	days	EHTR
	13	12-JUN-18 08:30	19-JUN-18 00:00	3	7	days	EHTR
Anions and Nutrients							
Nitrate in Water by IC (Low Level)							
	1	11-JUN-18 08:45	19-JUN-18 08:00	3	8	days	EHTR
	2	11-JUN-18 09:00	19-JUN-18 08:00	3	8	days	EHTR
	3	11-JUN-18 09:10	19-JUN-18 08:00	3	8	days	EHTR
	4	11-JUN-18 09:20	19-JUN-18 08:00	3	8	days	EHTR
	5	11-JUN-18 10:45	19-JUN-18 08:00	3	8	days	EHTR
	6	11-JUN-18 11:15	19-JUN-18 08:00	3	8	days	EHTR
	7	11-JUN-18 12:45	19-JUN-18 08:00	3	8	days	EHTR
	8	11-JUN-18 13:00	19-JUN-18 08:00	3	8	days	EHTR
	9	11-JUN-18 13:30	19-JUN-18 08:00	3	8	days	EHTR
	10	11-JUN-18 14:00	19-JUN-18 08:00	3	8	days	EHTR
	11	11-JUN-18 15:00	19-JUN-18 08:00	3	8	days	EHTR
	13	12-JUN-18 08:30	22-JUN-18 08:00	3	10	days	EHTR
Nitrite in Water by IC (Low Level)							
	1	11-JUN-18 08:45	19-JUN-18 08:00	3	8	days	EHTR
	2	11-JUN-18 09:00	19-JUN-18 08:00	3	8	days	EHTR
	3	11-JUN-18 09:10	19-JUN-18 08:00	3	8	days	EHTR
	4	11-JUN-18 09:20	19-JUN-18 08:00	3	8	days	EHTR
	5	11-JUN-18 10:45	19-JUN-18 08:00	3	8	days	EHTR
	6	11-JUN-18 11:15	19-JUN-18 08:00	3	8	days	EHTR
	7	11-JUN-18 12:45	19-JUN-18 08:00	3	8	days	EHTR
	8	11-JUN-18 13:00	19-JUN-18 08:00	3	8	days	EHTR
	9	11-JUN-18 13:30	19-JUN-18 08:00	3	8	days	EHTR
	10	11-JUN-18 14:00	19-JUN-18 08:00	3	8	days	EHTR
	11	11-JUN-18 15:00	19-JUN-18 08:00	3	8	days	EHTR
	13	12-JUN-18 08:30	19-JUN-18 08:00	3	7	days	EHTR
Total Dissolved P in Water by Colour							
	1	11-JUN-18 08:45	14-JUL-18 00:00	28	33	days	EHT
	2	11-JUN-18 09:00	12-JUL-18 00:00	28	31	days	EHT
	3	11-JUN-18 09:10	12-JUL-18 00:00	28	31	days	EHT
	4	11-JUN-18 09:20	12-JUL-18 00:00	28	31	days	EHT
	5	11-JUN-18 10:45	12-JUL-18 00:00	28	31	days	EHT
	6	11-JUN-18 11:15	12-JUL-18 00:00	28	31	days	EHT
	7	11-JUN-18 12:45	12-JUL-18 00:00	28	30	days	EHT
	8	11-JUN-18 13:00	12-JUL-18 00:00	28	30	days	EHT
	9	11-JUN-18 13:30	12-JUL-18 00:00	28	30	days	EHT
	10	11-JUN-18 14:00	12-JUL-18 00:00	28	30	days	EHT
	11	11-JUN-18 15:00	12-JUL-18 00:00	28	30	days	EHT
	13	12-JUN-18 08:30	12-JUL-18 00:00	28	30	days	EHT
Total Kjeldahl Nitrogen							
	1	11-JUN-18 08:45	10-JUL-18 09:00	28	29	days	EHT
	2	11-JUN-18 09:00	10-JUL-18 09:00	28	29	days	EHT
	3	11-JUN-18 09:10	10-JUL-18 09:00	28	29	days	EHT
	4	11-JUN-18 09:20	10-JUL-18 09:00	28	29	days	EHT
	5	11-JUN-18 10:45	10-JUL-18 09:00	28	29	days	EHT
	6	11-JUN-18 11:15	10-JUL-18 09:00	28	29	days	EHT

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Anions and Nutrients							
Total Kjeldahl Nitrogen							
	7	11-JUN-18 12:45	10-JUL-18 09:00	28	29	days	EHT
	8	11-JUN-18 13:00	10-JUL-18 09:00	28	29	days	EHT
	9	11-JUN-18 13:30	10-JUL-18 09:00	28	29	days	EHT
	10	11-JUN-18 14:00	10-JUL-18 09:00	28	29	days	EHT
	11	11-JUN-18 15:00	10-JUL-18 09:00	28	29	days	EHT
Total P in Water by Colour							
	1	11-JUN-18 08:45	14-JUL-18 00:00	28	33	days	EHT
	2	11-JUN-18 09:00	12-JUL-18 00:00	28	31	days	EHT
	3	11-JUN-18 09:10	12-JUL-18 00:00	28	31	days	EHT
	4	11-JUN-18 09:20	12-JUL-18 00:00	28	31	days	EHT
	5	11-JUN-18 10:45	12-JUL-18 00:00	28	31	days	EHT
	6	11-JUN-18 11:15	12-JUL-18 00:00	28	31	days	EHT
	7	11-JUN-18 12:45	12-JUL-18 00:00	28	30	days	EHT
	8	11-JUN-18 13:00	12-JUL-18 00:00	28	30	days	EHT
	9	11-JUN-18 13:30	12-JUL-18 00:00	28	30	days	EHT
	10	11-JUN-18 14:00	12-JUL-18 00:00	28	30	days	EHT
	11	11-JUN-18 15:00	12-JUL-18 00:00	28	30	days	EHT
	13	12-JUN-18 08:30	12-JUL-18 00:00	28	30	days	EHT
pH, Conductivity and Total Alkalinity							
	1	11-JUN-18 08:45	09-JUL-18 09:00	14	28	days	EHT
	2	11-JUN-18 09:00	09-JUL-18 09:00	14	28	days	EHT
	3	11-JUN-18 09:10	04-JUL-18 09:00	14	23	days	EHT
	4	11-JUN-18 09:20	04-JUL-18 09:00	14	23	days	EHT
	5	11-JUN-18 10:45	04-JUL-18 09:00	14	23	days	EHT
	6	11-JUN-18 11:15	09-JUL-18 09:00	14	28	days	EHT
	7	11-JUN-18 12:45	04-JUL-18 09:00	14	23	days	EHT
	8	11-JUN-18 13:00	04-JUL-18 09:00	14	23	days	EHT
	9	11-JUN-18 13:30	04-JUL-18 09:00	14	23	days	EHT
	10	11-JUN-18 14:00	04-JUL-18 09:00	14	23	days	EHT
	11	11-JUN-18 15:00	04-JUL-18 09:00	14	23	days	EHT
	13	12-JUN-18 08:30	12-JUL-18 09:00	14	30	days	EHT
Organic / Inorganic Carbon							
Dissolved Organic Carbon by Combustion							
	8	11-JUN-18 13:00	11-JUL-18 15:00	28	30	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 L2113424 were received on 15-JUN-18 15:30.

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.

Quality Control Report

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.

Friday, July 13, 2018

Jessica Spira
ALS Environmental
9936 67th Avenue
Edmonton, AB T6E 0P5

Re: ALS Workorder: 1806601
Project Name:
Project Number: L2113424

Dear Ms. Spira:

Ten water samples were received from ALS Environmental, on 6/26/2018. The samples were scheduled for the following analysis:

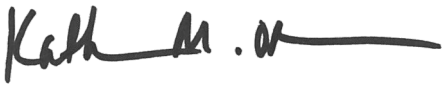
Radium-226

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,



ALS Environmental
Katie M. OBrien
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280

1806601

Radium-226:
The samples were prepared and analyzed according to the current revision of SOP 783.

All acceptance criteria were met.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1806601
Client Name: ALS Environmental
Client Project Name:
Client Project Number: L2113424
Client PO Number: L2113424

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L2113424-1	1806601-1		WATER	11-Jun-18	
L2113424-2	1806601-2		WATER	11-Jun-18	
L2113424-3	1806601-3		WATER	11-Jun-18	
L2113424-4	1806601-4		WATER	11-Jun-18	
L2113424-5	1806601-5		WATER	11-Jun-18	
L2113424-6	1806601-6		WATER	11-Jun-18	
L2113424-7	1806601-7		WATER	11-Jun-18	
L2113424-8	1806601-8		WATER	11-Jun-18	
L2113424-9	1806601-9		WATER	11-Jun-18	
L2113424-10	1806601-10		WATER	11-Jun-18	

ALS Environmental

1806601

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA
225 COMMERCE DRIVE
FORT COLLINS,CO 80524

NOTES: Please reference on final report and invoice: PO# *L2113424*
ALS requires QC data to be provided with your final results.

10 10 All except fraction #1,11,13

Please see enclosed ~~13~~ **sample(s) in** ~~18~~ **Container(s)**

	SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
1	**L2113424-1 BRP-39A**	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	**6/11/2018** 7/10/2018	
2	**L2113424-2 BRP-39B**	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	**6/11/2018** 7/10/2018	
3	**L2113424-3 BRP-100**	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	**6/11/2018** 7/10/2018	
4	**L2113424-4 BRP-18**	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	**6/11/2018** 7/10/2018	
5	**L2113424-5 BRP-19**	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	**6/11/2018** 7/10/2018	
6	**L2113424-6 BRP-23**	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	**6/11/2018** 7/10/2018	
7	**L2113424-7 BRP-34A**	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	**6/11/2018** 7/10/2018	
8	**L2113424-8 BRP-34B**	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	**6/11/2018** 7/10/2018	
9	**L2113424-9 BRP-37A**	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	**6/11/2018** 7/10/2018	
10	**L2113424-10 BRP-37B**	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	**6/11/2018** 7/10/2018	

ALS Environmental

1806601

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA
225 COMMERCE DRIVE
FORT COLLINS,CO 80524

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
~~11~~ L2113424-11 BRP-101		6/11/2018	
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	7/10/2018	
kmo 6/26/18 ~~12~~ L2113424-13 BRP-102			
	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	7/10/2018	

Subcontract Info Contact: Rani Mangru (780) 413-5242
Analysis and reporting info contact: Jessica Spira, Env. Tech. DIPL
9450 17 AVENUE NW
EDMONTON,AB T6N 1M9
Phone: (780) 413-5242 Email:Jessica.Spira@alsglobal.com

Please email confirmation of receipt to: Jessica.Spira@alsglobal.com

Shipped By: _____ Date Shipped: _____

Received By: [signature] Date Received: 6/26/18 09:25

Verified By: _____ Date Verified: _____

Temperature: _____

Sample Integrity Issues: _____

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS Edmonton Workorder No: 1806601

Project Manager: KO Initials: NG Date: 6/26/18

1. Does this project require any special handling in addition to standard ALS procedures?		YES	(NO)
2. Are custody seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		(YES)	NO
5. Are the COC and bottle labels complete and legible?		(YES)	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		(YES)	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	(YES)	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	(YES)	NO
9. Are all aqueous non-preserved samples pH 4-9?	(N/A)	YES	NO
10. Is there sufficient sample for the requested analyses?		(YES)	NO
11. Were all samples placed in the proper containers for the requested analyses?		(YES)	NO
12. Are all samples within holding times for the requested analyses?		(YES)	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		(YES)	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	(N/A)	YES	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES	(NO)
16. Were the samples shipped on ice?		(YES)	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #1 #3 (#4)	(RAD ONLY)	YES	(NO)

Cooler #:	1							
Temperature (°C):	8.0							
No. of custody seals on cooler:	0							
DOT Survey/ Acceptance Information — External µR/hr reading:	11							
Background µR/hr reading:	12							

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? **YES / NO / NA** (If no, see Form 008.)

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

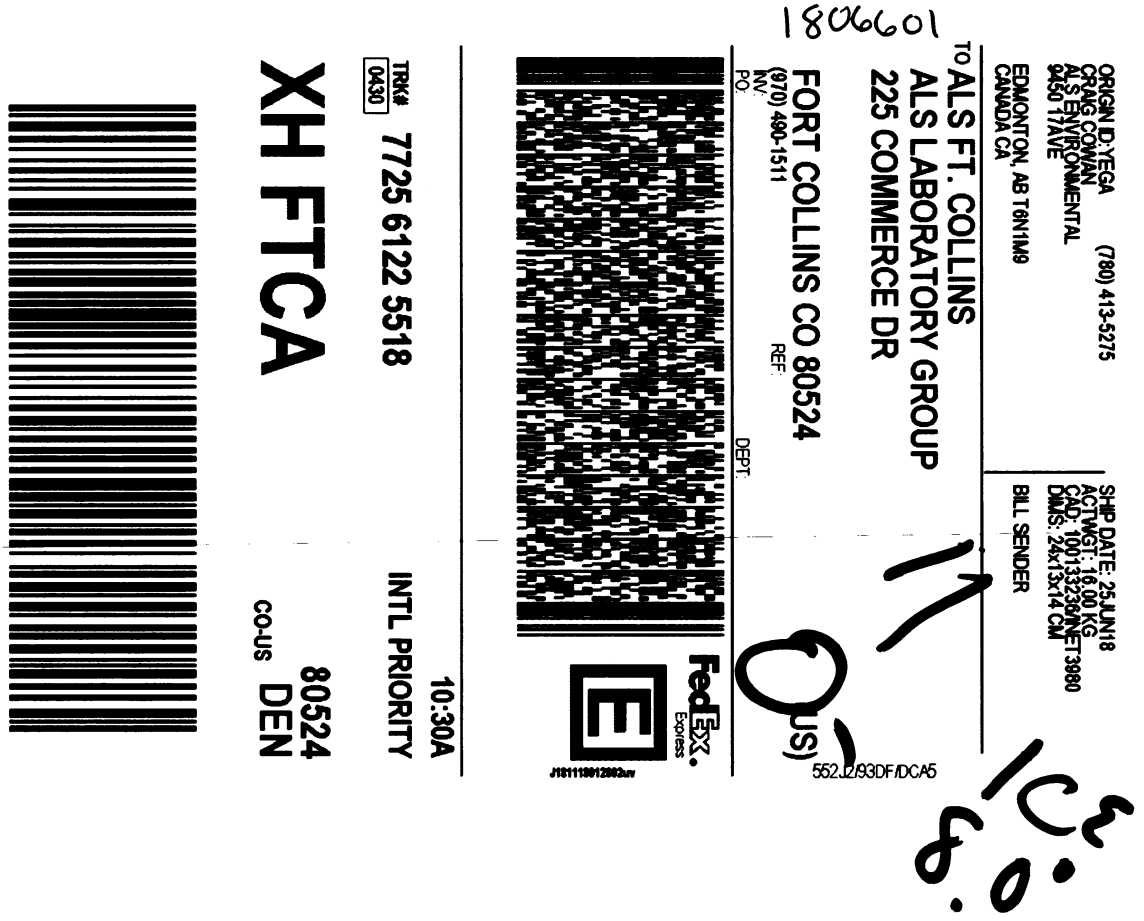
- Samples 11 and 12 are missing from work order (Not included in cooler)
- COC does mention 11 and 12 are not included

If applicable, was the client contacted? **YES / NO / NA** Contact: _____ Date/Time: _____

Project Manager Signature / Date: 6/26/18

Form 201r25.xls
(02/12/2018)

*IR Gun #1, VWR SN 170560549
*IR Gun #3, VWR SN 170647571
*IR Gun #4, Oakton, SN 2372220101-0002



After printing this label:

CONSIGNEE COPY - PLEASE PLACE IN FRONT OF POUCH

1. Fold the printed page along the horizontal line.
2. Place label in shipping pouch and affix it to your shipment.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

LEGAL TERMS AND CONDITIONS OF FEDEX SHIPPING DEFINITIONS. On this Air Waybill, "we", "our", "us", and "FedEx" refer to Federal Express Corporation, its subsidiaries and branches and their respective employees, agents, and independent contractors. The terms "you" and "your" refer to the shipper, its employees, principals and agents. If your shipment originates outside the United States, your contract of carriage is with the FedEx subsidiary, branch or independent contractor who originally accepts the shipment from you. The term "package" means any container or envelope that is accepted by us for delivery, including any such items tendered by you utilizing our automated systems, meters, manifests or waybills. The term "shipment" means all packages which are tendered to and accepted by us on a single Air Waybill. AIR CARRIAGE NOTICE. For any international shipments by air, the Warsaw Convention, as amended, may be applicable. The Warsaw Convention, as amended, will then govern and in most cases limit FedEx's liability for loss, delay of, or damage to your shipment. The Warsaw Convention, as amended, limits FedEx's liability. For example in the U.S. liability is limited to $9.07 per pound (20$ per kilogram), unless a higher value for carriage is declared as described below and you pay any applicable supplementary charges. The interpretation and operation of the Warsaw Convention's liability limits may vary in each country. There are no specific stopping places which are agreed to and FedEx reserves the right to route the shipment in any way FedEx deems appropriate. ROAD TRANSPORT NOTICE. Shipments transported solely by road to or from a country which is a party to the Warsaw Convention or the Contract for the International Carriage of Goods by Road (the "CMR") are subject to the terms and conditions of the CMR, notwithstanding any other provision of this Air Waybill to the contrary. For those shipments transported solely by road, if a conflict arises between the provisions of the CMR and this Air Waybill, the terms of the CMR shall prevail. LIMITATION OF LIABILITY. If not governed by the Warsaw Convention, the CMR, or other international treaties, laws, other government regulations, orders, or requirements, FedEx's maximum liability for damage, loss, delay, shortage, mis-delivery, nondelivery, misinformation or failure to provide information in connection with your shipment is limited by this Agreement and as set out in the terms and conditions of the contract of carriage. Please refer to the contract of carriage set forth in the applicable FedEx Service Guide or its equivalent to determine the contractual limitation. FedEx does not provide cargo liability or all-risk insurance, but you may pay an additional charge for each additional U.S. $100 (or equivalent local currency for the country of origin) of declared value for carriage. If a higher value for carriage is declared and the additional charge is paid, FedEx's maximum liability will be the lesser of the declared value for carriage or your actual damages. LIABILITIES NOT ASSUMED. IN ANY EVENT, FEDEX WON'T BE LIABLE FOR ANY DAMAGES, WHETHER DIRECT, INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL IN EXCESS OF THE DECLARED VALUE FOR CARRIAGE (INCLUDING BUT NOT LIMITED TO LOSS OF INCOME OR PROFITS) OR THE ACTUAL VALUE OF THE SHIPMENT, IF LOWER, WHETHER OR NOT FEDEX HAD ANY KNOWLEDGE THAT SUCH DAMAGES MIGHT BE INCURRED. FedEx won't be liable for your acts or omissions, including but not limited to incorrect declaration of cargo, improper or insufficient packaging, securing, marking or addressing of the shipment, or for the acts or omissions of the recipient or anyone else with an interest in the shipment or violations by any party of the terms of this agreement. FedEx won't be liable for damage, loss, delay, shortage, mis-delivery, non-delivery, misinformation or failure to provide information in connection with shipments of cash, currency or other prohibited items or in instances beyond our control, such as acts of God, perils of the air, weather conditions, mechanical delays, acts of public enemies, war, strike, civil commotion, or acts or omissions of public authorities(including customs and health officials) with actual or apparent authority. NO WARRANTY. We make no warranties, express or implied. CLAIMS FOR LOSS, DAMAGE OR DELAY. ALL CLAIMS MUST BE MADE IN WRITING AND WITHIN STRICT TIME LIMITS. SEE OUR TARIFF, APPLICABLE FEDEX SERVICE GUIDE, OR STANDARD CONDITIONS OF CARRIAGE FOR DETAILS. The Warsaw Convention provides specific written claims procedures for damage, delay or non-delivery of your shipment. Moreover, the interpretation and operation of the Warsaw Convention's claims provisions may vary in each country. Refer to the Convention to determine the claims period for your shipment. The right to damages against us shall be extinguished unless an action is brought within two years, as set forth in the Convention. FedEx is not obligated to act on any claim until all transportation charges have been paid. The claim amount may not be deducted from the transportation charges. If the recipient accepts the shipment without noting any damage on the delivery record, FedEx will assume the shipment was delivered in good condition. In order for us to consider a claim for damage, the contents, original shipping carton and packing must be made available to us for inspection. MANDATORY LAW. Insofar as any provision contained or referred to in this Air Waybill may be contrary to any applicable international treaties, laws, government regulations, orders or requirements such provisions shall remain in effect as a part of our agreement to the extent that it is not overridden. The invalidity or unenforceability of any provisions shall not affect any other part of this Air Waybill. Unless otherwise indicated, FEDERAL EXPRESS CORPORATION, 2005 Corporate Avenue, Memphis, TN 38132, USA, is the first carrier of this shipment. Email address located at www.fedex.com.

Client:	ALS Environmental	**Date:**	*13-Jul-18*
Project:	L2113424	**Work Order:**	1806601
Sample ID:	L2113424-1	**Lab ID:**	1806601-1
Legal Location:		**Matrix:**	WATER
Collection Date:	6/11/2018	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**SOP 783**		Prep Date: **6/28/2018**		PrepBy: **LOW**
Ra-226	ND (+/- 0.0041)	U	0.0067	BQ/l	NA	7/12/2018 11:37
Carr: BARIUM	*78.8*		*40-110*	*%REC*	DL = NA	7/12/2018 11:37

Client:	ALS Environmental	**Date:**	*13-Jul-18*
Project:	L2113424	**Work Order:**	1806601
Sample ID:	L2113424-2	**Lab ID:**	1806601-2
Legal Location:		**Matrix:**	WATER
Collection Date:	6/11/2018	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**SOP 783**		Prep Date: **6/28/2018**	PrepBy: **LOW**	
Ra-226	ND (+/- 0.0045)	U	0.0075	BQ/l	NA	7/12/2018 11:37
Carr: BARIUM	*86.7*		*40-110*	*%REC*	DL = NA	7/12/2018 11:37

Client:	ALS Environmental	**Date:**	*13-Jul-18*
Project:	L2113424	**Work Order:**	1806601
Sample ID:	L2113424-3	**Lab ID:**	1806601-3
Legal Location:		**Matrix:**	WATER
Collection Date:	6/11/2018	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**SOP 783**		Prep Date: **6/28/2018**		PrepBy: **LOW**
Ra-226	ND (+/- 0.0037)	U	0.0055	BQ/l	NA	7/12/2018 11:37
Carr: BARIUM	*82.9*		*40-110*	*%REC*	DL = NA	7/12/2018 11:37

Client:	ALS Environmental	**Date:**	*13-Jul-18*
Project:	L2113424	**Work Order:**	1806601
Sample ID:	L2113424-4	**Lab ID:**	1806601-4
Legal Location:		**Matrix:**	WATER
Collection Date:	6/11/2018	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**SOP 783**		Prep Date: **6/28/2018**		PrepBy: **LOW**
Ra-226	ND (+/- 0.004)	U	0.0065	BQ/l	NA	7/12/2018 11:37
Carr: BARIUM	*87*		*40-110*	*%REC*	DL = NA	7/12/2018 11:37

Client:	ALS Environmental	**Date:**	*13-Jul-18*
Project:	L2113424	**Work Order:**	1806601
Sample ID:	L2113424-5	**Lab ID:**	1806601-5
Legal Location:		**Matrix:**	WATER
Collection Date:	6/11/2018	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**SOP 783**		Prep Date: **6/28/2018**		PrepBy: **LOW**
Ra-226	ND (+/- 0.004)	U	0.0066	BQ/l	NA	7/12/2018 11:37
Carr: BARIUM	*83.7*		*40-110*	*%REC*	DL = NA	7/12/2018 11:37

Client:	ALS Environmental	**Date:**	*13-Jul-18*
Project:	L2113424	**Work Order:**	1806601
Sample ID:	L2113424-6	**Lab ID:**	1806601-6
Legal Location:		**Matrix:**	WATER
Collection Date:	6/11/2018	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**SOP 783**		Prep Date: **6/28/2018**		PrepBy: **LOW**
Ra-226	ND (+/- 0.0044)	U	0.0073	BQ/l	NA	7/12/2018 11:37
Carr: BARIUM	*76.2*		*40-110*	*%REC*	DL = NA	7/12/2018 11:37

Client:	ALS Environmental	**Date:**	*13-Jul-18*
Project:	L2113424	**Work Order:**	1806601
Sample ID:	L2113424-7	**Lab ID:**	1806601-7
Legal Location:		**Matrix:**	WATER
Collection Date:	6/11/2018	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**SOP 783**		Prep Date: **6/28/2018**		PrepBy: **LOW**
Ra-226	ND (+/- 0.0041)	U	0.0074	BQ/l	NA	7/12/2018 11:37
Carr: BARIUM	*79.5*		*40-110*	*%REC*	DL = NA	7/12/2018 11:37

Client:	ALS Environmental	**Date:**	*13-Jul-18*
Project:	L2113424	**Work Order:**	1806601
Sample ID:	L2113424-8	**Lab ID:**	1806601-8
Legal Location:		**Matrix:**	WATER
Collection Date:	6/11/2018	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**SOP 783**		Prep Date: **6/28/2018**		PrepBy: **LOW**
Ra-226	ND (+/- 0.0059)	U,M	0.0117	BQ/l	NA	7/12/2018 11:37
Carr: BARIUM	*77.4*		*40-110*	*%REC*	DL = NA	7/12/2018 11:37

Client:	ALS Environmental	**Date:**	*13-Jul-18*
Project:	L2113424	**Work Order:**	1806601
Sample ID:	L2113424-9	**Lab ID:**	1806601-9
Legal Location:		**Matrix:**	WATER
Collection Date:	6/11/2018	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**SOP 783**		Prep Date: **6/28/2018**		PrepBy: **LOW**
Ra-226	ND (+/- 0.0052)	U	0.0086	BQ/l	NA	7/12/2018 12:15
Carr: BARIUM	*70.6*		*40-110*	*%REC*	DL = NA	7/12/2018 12:15

Client:	ALS Environmental	**Date:**	*13-Jul-18*
Project:	L2113424	**Work Order:**	1806601
Sample ID:	L2113424-10	**Lab ID:**	1806601-10
Legal Location:		**Matrix:**	WATER
Collection Date:	6/11/2018	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**SOP 783**			Prep Date: **6/28/2018**	PrepBy: **LOW**
Ra-226	**0.0122 (+/- 0.0083)**	M3	**0.0107**	**BQ/l**	NA	7/12/2018 12:15
Carr: BARIUM	*68.6*		*40-110*	*%REC*	DL = NA	7/12/2018 12:15

Client:	ALS Environmental	**Date:**	*13-Jul-18*
Project:	L2113424	**Work Order:**	1806601
Sample ID:	L2113424-10	**Lab ID:**	1806601-10
Legal Location:		**Matrix:**	WATER
Collection Date:	6/11/2018	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed

Explanation of Qualifiers

Radiochemistry:

- "Report Limit" is the MDC

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

LT - Result is less than requested MDC but greater than achieved MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

QC BATCH REPORT

Batch ID: **RE180628-2-2** Instrument ID **Alpha Scin** Method: **Radium-226 by Radon Emanation**

LCS Sample ID: **RE180628-2** Units: **BQ/l** Analysis Date: **7/12/2018 12:53**

Client ID: Run ID: **RE180628-2A** Prep Date: **6/28/2018** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.98 (+/- 0.49)	0.01	1.772		112	67-120					P,M3
Carr: BARIUM	15940		17200		92.7	40-110					

LCSD Sample ID: **RE180628-2** Units: **BQ/l** Analysis Date: **7/12/2018 12:53**

Client ID: Run ID: **RE180628-2A** Prep Date: **6/28/2018** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.91 (+/- 0.47)	0.01	1.772		108	67-120		1.98	0.1	2.1	P,M3
Carr: BARIUM	15960		17200		92.8	40-110		15940			

MB Sample ID: **RE180628-2** Units: **BQ/l** Analysis Date: **7/12/2018 12:53**

Client ID: Run ID: **RE180628-2A** Prep Date: **6/28/2018** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	ND	0.0083									U
Carr: BARIUM	16010		17200		93.1	40-110					

The following samples were analyzed in this batch:

1806601-1	1806601-2	1806601-3
1806601-4	1806601-5	1806601-6
1806601-7	1806601-8	1806601-9
1806601-10		

Monday, July 09, 2018

Jessica Spira
ALS Environmental
9936 67th Avenue
Edmonton, AB T6E 0P5

Re: ALS Workorder: 1806491
Project Name:
Project Number: L2113424

Dear Ms. Spira:

Two water samples were received from ALS Environmental, on 6/21/2018. The samples were scheduled for the following analysis:

Radium-226

The results for these analyses are contained in the enclosed reports.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, ALS certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Thank you for your confidence in ALS Environmental. Should you have any questions, please call.

Sincerely,

ALS Environmental
Katie M. OBrien
Project Manager

ALS Environmental – Fort Collins is accredited by the following accreditation bodies for various testing scopes in accordance with requirements of each accreditation body. All testing is performed under the laboratory management system, which is maintained to meet these requirement and regulations. Please contact the laboratory or accreditation body for the current scope testing parameters.

ALS Environmental – Fort Collins	
Accreditation Body	License or Certification Number
AIHA	214884
Alaska (AK)	UST-086
Arizona (AZ)	AZ0742
California (CA)	06251CA
Colorado (CO)	CO01099
Florida (FL)	E87914
Idaho (ID)	CO01099
Kansas (KS)	E-10381
Kentucky (KY)	90137
PJ-LA (DoD ELAP/ISO 170250)	95377
Maryland (MD)	285
Missouri (MO)	175
Nebraska(NE)	NE-OS-24-13
Nevada (NV)	CO000782008A
New York (NY)	12036
North Dakota (ND)	R-057
Oklahoma (OK)	1301
Pennsylvania (PA)	68-03116
Tennessee (TN)	2976
Texas (TX)	T104704241
Utah (UT)	CO01099
Washington (WA)	C1280

1806491

Radium-226:
The samples were prepared and analyzed according to the current revision of SOP 783 .

All acceptance criteria were met.

ALS -- Fort Collins

Sample Number(s) Cross-Reference Table

OrderNum: 1806491
Client Name: ALS Environmental
Client Project Name:
Client Project Number: L2113424
Client PO Number: L2113424

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
L2113424-11	1806491-1		WATER	11-Jun-18	
L2113424-13	1806491-2		WATER	12-Jun-18	8:30

180691

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA
225 COMMERCE DRIVE
FORT COLLINS,CO 80524

NOTES: ~~Please reference on final report and invoice: PO# L2113424~~
ALS requires QC data to be provided with your final results.
11 and 13 only

Please see enclosed 12 sample(s) in 12 Container(s)

SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
L2113424-1 BRP-39A	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	6/11/2018 7/10/2018	
L2113424-2 BRP-39B	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	6/11/2018 7/10/2018	
L2113424-3 BRP-100	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	6/11/2018 7/10/2018	
L2113424-4 BRP-18	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	6/11/2018 7/10/2018	
L2113424-5 BRP-19	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	6/11/2018 7/10/2018	
L2113424-6 BRP-23	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	6/11/2018 7/10/2018	
L2113424-7 BRP-34A	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	6/11/2018 7/10/2018	
L2113424-8 BRP-34B	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	6/11/2018 7/10/2018	
L2113424-9 BRP-37A	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	6/11/2018 7/10/2018	
L2113424-10 BRP-37B	Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	6/11/2018 7/10/2018	

L2113424

EDMONTON

180649

Subcontract Request Form

Subcontract To:

ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA
225 COMMERCE DRIVE
FORT COLLINS,CO 80524

	SAMPLE NUMBER	ANALYTICAL REQUIRED	DATE SAMPLED / DUE DATE	Priority Flag
1	**L2113424-11 BRP-101**		**6/11/2018**	
		Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	7/10/2018	
2	**L2113424-13 BRP-102**		6/12/18 8:30	
		Ra226 by Alpha Scint, MDC=0.01 Bq/L (RA226-MMER-FC 1)	7/10/2018	

Subcontract Info Contact: Rani Mangru (780) 413-5242

Analysis and reporting info contact: Jessica Spira, Env. Tech. DIPL
9450 17 AVENUE NW
EDMONTON,AB T6N 1M9
Phone: (780) 413-5242 Email:Jessica.Spira@alsglobal.com

Please email confirmation of receipt to: Jessica.Spira@alsglobal.com

Shipped By: _____ Date Shipped: _____

Received By: LJ Date Received: 6/18 1:20P

Verified By: JB Date Verified: 6/21/18 09:20

Temperature: 8, 10, 10, 10

Sample Integrity Issues: _____

ALS Environmental - Fort Collins
CONDITION OF SAMPLE UPON RECEIPT FORM

Client: ALS Edmonton Workorder No: 1806491

Project Manager: KMO Initials: JE Date: 6/21/18

1. Does this project require any special handling in addition to standard ALS procedures?		YES	(NO)
2. Are custody seals on shipping containers intact?	(NONE)	YES	NO
3. Are Custody seals on sample containers intact?	(NONE)	YES	NO
4. Is there a COC (Chain-of-Custody) present or other representative documents?		(YES)	NO
5. ~~Are the COC and bottle labels complete and legible?~~		(YES)	NO
6. Is the COC in agreement with samples received? (IDs, dates, times, no. of samples, no. of containers, matrix, requested analyses, etc.)		(YES)	NO
7. Were airbills / shipping documents present and/or removable?	DROP OFF	(YES)	NO
8. Are all aqueous samples requiring preservation preserved correctly? (excluding volatiles)	N/A	(YES)	NO
9. Are all aqueous non-preserved samples pH 4-9?	(N/A)	YES	NO
10. Is there sufficient sample for the requested analyses?		(YES)	NO
11. Were all samples placed in the proper containers for the requested analyses?		(YES)	NO
12. Are all samples within holding times for the requested analyses?		(YES)	NO
13. Were all sample containers received intact? (not broken or leaking, etc.)		(YES)	NO
14. Are all samples requiring no headspace (VOC, GRO, RSK/MEE, Rx CN/S, radon) headspace free? Size of bubble: ____ < green pea ____ > green pea	(N/A)	YES	NO
15. Do any water samples contain sediment? Amount Amount of sediment: ____ dusting ____ moderate ____ heavy	N/A	YES	(NO)
16. Were the samples shipped on ice?		(YES)	NO
17. Were cooler temperatures measured at 0.1-6.0°C? IR gun used*: #1 #3 #4	(RAD ONLY)	YES	(NO)

Cooler #:	1							
Temperature (°C):	6.9							
No. of custody seals on cooler:	0							
DOT Survey/ Acceptance Information: External µR/hr reading:	11							
Background µR/hr reading:	12							

Were external µR/hr readings ≤ two times background and within DOT acceptance criteria? **YES / NO / NA** (If no, see Form 008.)

Additional Information: PROVIDE DETAILS BELOW FOR A NO RESPONSE TO ANY QUESTION ABOVE, EXCEPT #1 AND #16.

Sampling date for L2113424-13 is 6/12/18 8:30 AM

If applicable, was the client contacted? (YES) / NO / NA Contact: Jessica Spira Date/Time: 6/22/18 9:45

Project Manager Signature / Date: 6/22/18

Form 201r25.xls
(02/12/2018)

*IR Gun #1, VWR SN 170560549
*IR Gun #3, VWR SN 170647571
*IR Gun #4, Oakton, SN 2372220101-0002

1806491

11 0

6.9 kg

ORIGIN ID:YBYA (604) 253-4188
HARJIT GILL
ALS ENVIRONMENTAL LAB GROUP
LOUGHEED HIGHWAY

BURNABY, BC V5A1W9
CANADA, CA

Ship Date: 20JUN18
ActWgt: 10.00 LB MAN
CAD: 0347419/CAFE3210

BILL SENDER
EIN/VAT:

TO SAMPLE RECEVING
ALS ENVIRONMANTAL
225 COMMERCE DRIVE

FORT COLLINS, CO 80524

(970) 490-1511

FedEx Express

(US)

J1811180420200V

AWB

XH FTCA

PKG TYPE: CUSTOMER

TRK# 4432 4287 6517

Form 0430

10:30A
INTL PRIORITY

REF: Sublets
DESC1:environmental water samples for anlysis only.
DESC2:
DESC3:
DESC4:

COUNTRY MFG: CA
CARRIAGE VALUE: 0.00 CAD
CUSTOMS VALUE: 8.00 CAD

SIGN: HARJIT GILL
T/C: S **********
DIT: R

These commodities, technology, or software were exported from Canada in accordance with the export administration regulations. Diversion contrary to Canadian law prohibited. The Warsaw Convention may apply and will govern and in most cases limit the liability of Federal Express for loss or delay of or damage to your shipment. Subject to the conditions of the contract.

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1. Fold the printed page along the horizontal line.
2. Place label in shipping pouch and affix it to your shipment.

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Client:	ALS Environmental	**Date:**	*09-Jul-18*
Project:	L2113424	**Work Order:**	1806491
Sample ID:	L2113424-11	**Lab ID:**	1806491-1
Legal Location:		**Matrix:**	WATER
Collection Date:	6/11/2018	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**SOP 783**		Prep Date: **6/27/2018**		PrepBy: **LOW**
Ra-226	ND (+/- 0.0036)	U	0.0076	BQ/l	NA	7/6/2018 13:03
Carr: BARIUM	*98.8*		*40-110*	*%REC*	DL = NA	7/6/2018 13:03

Client:	ALS Environmental	**Date:**	*09-Jul-18*
Project:	L2113424	**Work Order:**	1806491
Sample ID:	L2113424-13	**Lab ID:**	1806491-2
Legal Location:		**Matrix:**	WATER
Collection Date:	6/12/2018 08:30	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Radium-226 by Radon Emanation - Method 903.1		**SOP 783**			Prep Date: **6/27/2018**	PrepBy: **LOW**
Ra-226	ND (+/- 0.0031)	U	0.007	BQ/l	NA	7/6/2018 13:03
Carr: BARIUM	*96.4*		*40-110*	*%REC*	DL = NA	7/6/2018 13:03

Client:	ALS Environmental	**Date:**	*09-Jul-18*
Project:	L2113424	**Work Order:**	1806491
Sample ID:	L2113424-13	**Lab ID:**	1806491-2
Legal Location:		**Matrix:**	WATER
Collection Date:	6/12/2018 08:30	**Percent Moisture:**	

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed

Explanation of Qualifiers

Radiochemistry:

- "Report Limit" is the MDC

U or ND - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative yield is assumed.

Y2 - Chemical Yield outside default limits.

W - DER is greater than Warning Limit of 1.42

* - Aliquot Basis is 'As Received' while the Report Basis is 'Dry Weight'.

- Aliquot Basis is 'Dry Weight' while the Report Basis is 'As Received'.

G - Sample density differs by more than 15% of LCS density.

D - DER is greater than Control Limit

M - Requested MDC not met.

LT - Result is less than requested MDC but greater than achieved MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

L - LCS Recovery below lower control limit.

H - LCS Recovery above upper control limit.

P - LCS, Matrix Spike Recovery within control limits.

N - Matrix Spike Recovery outside control limits

NC - Not Calculated for duplicate results less than 5 times MDC

B - Analyte concentration greater than MDC.

B3 - Analyte concentration greater than MDC but less than Requested MDC.

Inorganics:

B - Result is less than the requested reporting limit but greater than the instrument method detection limit (MDL).

U or ND - Indicates that the compound was analyzed for but not detected.

E - The reported value is estimated because of the presence of interference. An explanatory note may be included in the narrative.

M - Duplicate injection precision was not met.

N - Spiked sample recovery not within control limits. A post spike is analyzed for all ICP analyses when the matrix spike and or spike duplicate fail and the native sample concentration is less than four times the spike added concentration.

Z - Spiked recovery not within control limits. An explanatory note may be included in the narrative.

* - Duplicate analysis (relative percent difference) not within control limits.

S - SAR value is estimated as one or more analytes used in the calculation were not detected above the detection limit.

Organics:

U or ND - Indicates that the compound was analyzed for but not detected.

B - Analyte is detected in the associated method blank as well as in the sample. It indicates probable blank contamination and warns the data user.

E - Analyte concentration exceeds the upper level of the calibration range.

J - Estimated value. The result is less than the reporting limit but greater than the instrument method detection limit (MDL).

A - A tentatively identified compound is a suspected aldol-condensation product.

X - The analyte was diluted below an accurate quantitation level.

* - The spike recovery is equal to or outside the control criteria used.

+ - The relative percent difference (RPD) equals or exceeds the control criteria.

G - A pattern resembling gasoline was detected in this sample.

D - A pattern resembling diesel was detected in this sample.

M - A pattern resembling motor oil was detected in this sample.

C - A pattern resembling crude oil was detected in this sample.

4 - A pattern resembling JP-4 was detected in this sample.

5 - A pattern resembling JP-5 was detected in this sample.

H - Indicates that the fuel pattern was in the heavier end of the retention time window for the analyte of interest.

L - Indicates that the fuel pattern was in the lighter end of the retention time window for the analyte of interest.

Z - This flag indicates that a significant fraction of the reported result did not resemble the patterns of any of the following petroleum hydrocarbon products:
- gasoline
- JP-8
- diesel
- mineral spirits
- motor oil
- Stoddard solvent
- bunker C

QC BATCH REPORT

Batch ID: **RE180627-2-2** Instrument ID **Alpha Scin** Method: **Radium-226 by Radon Emanation**

LCS Sample ID: **RE180627-2** Units: **BQ/l** Analysis Date: **7/6/2018 13:03**

Client ID: Run ID: **RE180627-2B** Prep Date: **6/27/2018** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.75 (+/- 0.43)	0.01	1.772		98.7	67-120					P
Carr: BARIUM	15550		15790		98.5	40-110					

LCSD Sample ID: **RE180627-2** Units: **BQ/l** Analysis Date: **7/6/2018 13:35**

Client ID: Run ID: **RE180627-2B** Prep Date: **6/27/2018** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	1.86 (+/- 0.46)	0.01	1.772		105	67-120		1.75	0.2	2.1	P
Carr: BARIUM	15020		15790		95.1	40-110		15550			

MB Sample ID: **RE180627-2** Units: **BQ/l** Analysis Date: **7/6/2018 13:03**

Client ID: Run ID: **RE180627-2B** Prep Date: **6/27/2018** DF: **NA**

Analyte	Result	ReportLimit	SPK Val	SPK Ref Value	%REC	Control Limit	Decision Level	DER Ref	DER	DER Limit	Qual
Ra-226	ND	0.0077									U
Carr: BARIUM	15170		15790		96	40-110					

The following samples were analyzed in this batch: 1806491-1 1806491-2

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2113424-COFC

COC Number: 14 -

Page 1 of 2

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Golder Associates Ltd.	Select Report Format:	☑PDF ☑EXCEL ☑EDD (DIGITAL)	R ☑Regular (Standard TAT if received by 3 pm - business days)
Contact:	Zenovia Craciunescu/Kerrie Serben	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	16820 107 Avenue Edmonton, Alberta, Canada T5P 4C3	☐Criteria on Report - provide details below if box checked		E ☐Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
Phone:	+1 780 930 6786/ +1 306 667 1531	Select Distribution:	☑EMAIL ☐MAIL ☐FAX	E2 ☐Same day or weekend emergency - contact ALS to confirm TAT and surcharge
		Email 1 or Fax	mkeefe@sabinagoldsilver.com	Specify Date Required for E2,E or P:
		Email 2	zcraciunescu@golder.com; Kerrie_Serben@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	mkeefe@sabinagoldsilver.com
Company:	Sabina Gold and Silver	Email 2	
Contact:	Merle Keefe (604 998 4190) mkeefe@sabinagoldsilver.com		

Project Information		Oil and Gas Required Fields (client use)	
ALS Bottle Order	BR210169/ Quote: Q63297	Approver ID:	Cost Center:
Job #:	1787890/~~2100~~ 2200 / 2240	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
	DLs in compliance with CCME Aquatic Life Guidelines	Location:	

ALS Lab Work Order # (lab use only)		ALS Contact: Jessica Spira	Sampler: TH, MK

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	GLD-CAL-WQ-MET-DU-ED	GLD-CAL-WQ-MET-TU-ED	GLD-CAL-WQ-NUT-ED	GLD-CAL-WQ-ROU-ED	HG-D-U-CVAF-VA	HG-T-U-CVAF-VA	N-T-CALC-ED	PO4-DO-L-COL-ED	SILICATE-L-COL-ED	Cyanides	Radium-226			Number of Containers
					F				F				P	P	P			
1	BRP-39A	11-Jun-18	845	Water	X	X	X	X	X	X	X	X	X	X	X			11
2	BRP-39B	11-Jun-18	900	Water	X	X	X	X	X	X	X	X	X	X	X			11
3	BRP-100	11-Jun-18	910	Water	X	X	X	X	X	X	X	X	X	X	X			11
4	BRP-18	11-Jun-18	920	Water	X	X	X	X	X	X	X	X	X	X	X			11
5	BRP-19	11-Jun-18	1045	Water	X	X	X	X	X	X	X	X	X	X	X			11
6	BRP-23	11-Jun-18	1115	Water	X	X	X	X	X	X	X	X	X	X	X			11
7	BRP-34A	11-Jun-18	1245	Water	X	X	X	X	X	X	X	X	X	X	X			11
8	BRP-34B	11-Jun-18	1300	Water	X	X	X	X	X	X	X	X	X	X	X			11
9	BRP-37A	11-Jun-18	1330	Water	X	X	X	X	X	X	X	X	X	X	X			11
10	BRP-37B	11-Jun-18	1400	Water	X	X	X	X	X	X	X	X	X	X	X			11
11	BRP-101	11-Jun-18	1500	Water	X	X	X	X	X	X	X	X	X	X	X			11
12	BRP-103	11-Jun-18	1600	Water					X	X	~~X~~							2

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☑ No Are samples for human drinking water use? ☐ Yes ☑ No	Filtered = Diss. Nutrients, Diss. Metals, Diss. Hg. Preserved = Sulphide, Cyanide, Diss. Nutrients, Total Nutrients, Rad 226.

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		
6.3					

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:
Tiffany Hnatiuk	12 Jun 18	1000		Jun 19/18	330			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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

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

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

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 2 of 2

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Golder Associates Ltd.	Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Zenovia Craciunescu/Kerrie Serben	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	16820 107 Avenue Edmonton, Alberta, Canada T5P 4C3	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
Phone:	+1 780 930 6786/ +1 306 667 1531	Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
		Email 1 or Fax	mkeefe@sabinagoldsilver.com	Specify Date Required for E2,E or P:
		Email 2	zcraciunescu@golder.com; Kerrie_Serben@golder.com	**Analysis Request**
Invoice To	Same as Report To ☐ Yes ☑ No	**Invoice Distribution**		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☐ Yes ☑ No	Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	
Company:	Sabina Gold and Silver	Email 1 or Fax	mkeefe@sabinagoldsilver.com	
Contact:	Merle Keefe (604 998 4190) mkeefe@sabinagoldsilver.com	Email 2		
Project Information		**Oil and Gas Required Fields (client use)**		
ALS Bottle Order	BR210169/ Quote: Q63297	Approver ID:	Cost Center:	
Job #:	1787890/~~2100~~ 2200/2240	GL Account:	Routing Code:	
PO / AFE:		Activity Code:		
	DLs in compliance with CCME Aquatic Life Guidelines	Location:		
ALS Lab Work Order # (lab use only)		**ALS Contact:** Jessica Spira	**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	GLD-CAL-WQ-MET-DU-ED	GLD-CAL-WQ-MET-TU-ED	GLD-CAL-WQ-NUT-ED	GLD-CAL-WQ-ROU-ED	HG-D-U-CVAF-VA	HG-T-U-CVAF-VA	N-T-CALC-ED	PO4-DO-L-COL-ED	SILICATE-L-COL-ED	Cyanides	Radium-226			Number of Containers
13	BRP-102	12 Jun 18	830	Water	~~X~~	X	X	X			X	X	X	X	X			9
				Water														
				Water														
				Water														
				Water														
				Water														
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				Water														
				Water														

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☐ No Are samples for human drinking water use? ☐ Yes ☐ No	Filtered = Diss. Nutrients, Diss. Metals Preserved = Sulphide, Cyanide, Diss. Nutrients, Total Nutrients, Rad226.

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
0.3					

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:
Tiffany Knatiuk	12Jun18	1000		12/6/18	330			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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

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

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

[redacted]

GOLDER ASSOCIATES LTD
ATTN: Zenovia Craciunescu / Kerrie Serbin
16820 107 Ave NW
EDMONTON AB T5P 4C3

Date Received: 18-JUL-18
Report Date: 04-SEP-18 09:44 (MT)
Version: FINAL

Client Phone: 780-483-3499

Certificate of Analysis

Lab Work Order #: L2131670

Project P.O. #: NOT SUBMITTED
Job Reference: 1787890/2100
C of C Numbers: 14
Legal Site Desc:

[redacted]

[redacted]PL

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[redacted]

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2131670-1 BRP-40-1							
Sampled By: CLIENT on 15-JUL-18 @ 11:30							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Aluminum (Al)-Dissolved	0.00258		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	0.000046		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000158		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00360		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	2.02		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	0.000021		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00059		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	0.0149		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	1.58		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.000864		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.000885		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.315		0.020	mg/L		21-AUG-18	R4180186
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.598		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.00689		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		21-AUG-18	R4180186
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.279		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	1.62		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.24		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	1.70		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.282		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0012		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							

* 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
L2131670-1 BRP-40-1							
Sampled By: CLIENT on 15-JUL-18 @ 11:30							
Matrix: WATER							
Total P in Water by Colour							
Phosphorus (P)-Total	0.0031		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	0.56		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	<2.0		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	11.5		0.053	mg/L		28-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	14.4			mg/L		28-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0285		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	5.23		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	15		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135893
Turbidity							
Turbidity	0.57		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.78		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	29.3		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	8.2		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	6.7		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0016		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	2.59		0.50	mg/L		12-AUG-18	R4168503
Cyanide, Free	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Ra-226	<0.0058		0.0058	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	0.586	DLHC	0.050	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.311		0.050	mg/L		16-AUG-18	
Total Organic Carbon	2.74		0.50	mg/L		12-AUG-18	R4168499
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00468		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	0.000057		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000163		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.00380		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711

* 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
L2131670-1 BRP-40-1							
Sampled By: CLIENT on 15-JUL-18 @ 11:30							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Boron (B)-Total	<0.0010		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000056		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00067		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.0475		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	0.000013		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	<0.00050		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.00266		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.000874		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.00699		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459
L2131670-2 BRP-40-1-1							
Sampled By: CLIENT on 15-JUL-18 @ 10:30							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Aluminum (Al)-Dissolved	0.00219		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	0.000060		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000166		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00364		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	2.01		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	0.000016		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00072		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	0.0162		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	1.59		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.000870		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.000859		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.316		0.020	mg/L		21-AUG-18	R4180186

* 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
L2131670-2 BRP-40-1-1							
Sampled By: CLIENT on 15-JUL-18 @ 10:30							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.599		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.00692		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		21-AUG-18	R4180186
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.247		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	1.51		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.24		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	1.56		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.293		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0013		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							
Phosphorus (P)-Total	0.0031		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	0.61		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	7.0		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	11.5		0.053	mg/L		28-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	14.5			mg/L		28-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	5.22		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	23		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135893

* 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
L2131670-2 BRP-40-1-1							
Sampled By: CLIENT on 15-JUL-18 @ 10:30							
Matrix: WATER							
Turbidity							
Turbidity	0.67		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.82		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	29.4		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	8.5		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	7.0		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	3.41		0.50	mg/L		20-AUG-18	R4179323
Cyanide, Free	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Ra-226	0.0057		0.0035	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	0.566	DLHC	0.050	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.293		0.050	mg/L		16-AUG-18	
Total Organic Carbon	3.02		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00513		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000148		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.00369		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Boron (B)-Total	<0.0010		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000054		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00055		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.0488		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	<0.00050		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.00273		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.000870		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.00685		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459

* 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
L2131670-3 BRP-40-2							
Sampled By: CLIENT on 15-JUL-18 @ 00:45							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Aluminum (Al)-Dissolved	0.00171		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	0.000021		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000138		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00356		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	1.99		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	0.000014		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00047		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	0.0139		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	1.53		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.000769		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.000862		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.294		0.020	mg/L		21-AUG-18	R4180186
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.585		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.00687		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		21-AUG-18	R4180186
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.257		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	1.77		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.26		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	1.67		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.299		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	<0.0010		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							

* 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
L2131670-3 BRP-40-2							
Sampled By: CLIENT on 15-JUL-18 @ 00:45							
Matrix: WATER							
Total P in Water by Colour							
Phosphorus (P)-Total	0.0028		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	0.55		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	3.9		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	11.3		0.053	mg/L		28-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	14.2			mg/L		28-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	5.23		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	23		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135893
Turbidity							
Turbidity	0.68		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.86		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	28.6		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	8.2		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	6.7		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0014		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	3.43		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Ra-226	<0.0066		0.0066	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	0.577	DLHC	0.050	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.299		0.050	mg/L		16-AUG-18	
Total Organic Carbon	3.03		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00444		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	0.000044		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000160		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.00374		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711

* 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
L2131670-3 BRP-40-2							
Sampled By: CLIENT on 15-JUL-18 @ 00:45							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Boron (B)-Total	<0.0010		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000054		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00065		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.0498		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	0.000013		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	<0.00050		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.00271		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.000902		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.00693		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	0.00010		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459
L2131670-4 BRP-40-3							
Sampled By: CLIENT on 15-JUL-18 @ 13:45							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Aluminum (Al)-Dissolved	0.00245		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	0.000026		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000150		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00356		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	2.00		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	0.000020		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00045		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	0.0153		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	1.55		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.000872		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.000832		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.307		0.020	mg/L		21-AUG-18	R4180186

* 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
L2131670-4 BRP-40-3							
Sampled By: CLIENT on 15-JUL-18 @ 13:45							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.595		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.00691		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		21-AUG-18	R4180186
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.249		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	1.79		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.24		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	1.61		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.279		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0013		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							
Phosphorus (P)-Total	0.0025		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	0.55		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	3.2		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	11.4		0.053	mg/L		28-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	14.4			mg/L		28-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0798		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	5.32		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	28		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135893

* 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
L2131670-4 BRP-40-3							
Sampled By: CLIENT on 15-JUL-18 @ 13:45							
Matrix: WATER							
Turbidity							
Turbidity	0.64		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.85		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	28.5		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	7.6		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	6.2		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0014		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	3.07		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		26-JUL-18	R4145075
Ra-226	0.012		0.0069	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	0.604	DLHC	0.050	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		26-JUL-18	R4145075
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.359		0.050	mg/L		16-AUG-18	
Total Organic Carbon	3.03		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		28-JUL-18	R4151433
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00427		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	0.000034		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000151		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.00366		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Boron (B)-Total	<0.0010		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000056		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00058		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.0479		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	<0.00050		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.00268		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.000876		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.00686		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459

* 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
L2131670-5 BRP-40-4							
Sampled By: CLIENT on 15-JUL-18 @ 14:45							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Aluminum (Al)-Dissolved	0.00216		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	0.000026		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000149		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00358		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	2.00		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	0.000021		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00048		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	0.0161		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	1.56		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.000936		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.000844		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.300		0.020	mg/L		21-AUG-18	R4180186
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.599		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.00681		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		21-AUG-18	R4180186
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.259		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	1.64		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.25		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	1.74		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.260		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0011		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							

* 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
L2131670-5 BRP-40-4							
Sampled By: CLIENT on 15-JUL-18 @ 14:45							
Matrix: WATER							
Total P in Water by Colour							
Phosphorus (P)-Total	0.0025		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	0.53		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	3.4		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	11.4		0.053	mg/L		28-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	14.2			mg/L		28-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	5.24		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	32		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135893
Turbidity							
Turbidity	0.69		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.85		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	28.7		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	8.1		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	6.6		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0014		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	2.95		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		26-JUL-18	R4145075
Ra-226	<0.0080		0.0080	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	0.614	DLHC	0.050	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		26-JUL-18	R4145075
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.260		0.050	mg/L		16-AUG-18	
Total Organic Carbon	3.00		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		28-JUL-18	R4151433
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00375		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000161		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.00376		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711

* 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
L2131670-5 BRP-40-4							
Sampled By: CLIENT on 15-JUL-18 @ 14:45							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Boron (B)-Total	<0.0010		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000051		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00051		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.0475		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	<0.00050		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.00262		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.000876		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.00686		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459
L2131670-6 BRP-40-5							
Sampled By: CLIENT on 15-JUL-18 @ 15:45							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Aluminum (Al)-Dissolved	0.00201		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000158		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00354		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	2.00		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	0.000018		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00045		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	0.0174		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	1.55		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.000823		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.000838		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.306		0.020	mg/L		21-AUG-18	R4180186

* 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
L2131670-6 BRP-40-5							
Sampled By: CLIENT on 15-JUL-18 @ 15:45							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.579		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.00683		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		21-AUG-18	R4180186
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.252		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	1.86		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.24		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	1.80		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	0.000076		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0554		0.0050	mg/L		30-AUG-18	R4194571
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.199	RRV	0.050	mg/L	21-AUG-18	22-AUG-18	R4180486
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0015		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							
Phosphorus (P)-Total	0.0023		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	0.55		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	2.7		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	11.4		0.13	mg/L		27-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	14.1			mg/L		30-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0080		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	5.24		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	44		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135893

* 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
L2131670-6 BRP-40-5							
Sampled By: CLIENT on 15-JUL-18 @ 15:45							
Matrix: WATER							
Turbidity							
Turbidity	0.73		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.85		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	28.7		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	7.8		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	6.4		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0021		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	3.00		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		26-JUL-18	R4145075
Ra-226	<0.0068		0.0068	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	0.566	DLHC	0.050	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		26-JUL-18	R4145075
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.167		0.050	mg/L		22-AUG-18	
Total Organic Carbon	3.70		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		28-JUL-18	R4151433
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00449		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	0.000056		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000152		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.00373		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Boron (B)-Total	<0.0010		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000054		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00062		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.0482		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	0.000010		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	<0.00050		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.00275		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.000850		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.00691		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459

* 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
L2131670-7 BRP-34A							
Sampled By: CLIENT on 14-JUL-18 @ 10:30							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Aluminum (Al)-Dissolved	0.00839		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000215		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00565		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	0.0012		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	0.0000089		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	3.10		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	0.000067		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00114		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	0.0147		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	0.00069		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	1.90		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.00297		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.00322		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.373		0.020	mg/L		21-AUG-18	R4180186
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.714		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.0149		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	0.0000072		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		21-AUG-18	R4180186
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.197		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	2.75		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.20		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	2.94		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0059		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.613		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0012		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							

* 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
L2131670-7 BRP-34A							
Sampled By: CLIENT on 14-JUL-18 @ 10:30							
Matrix: WATER							
Total P in Water by Colour							
Phosphorus (P)-Total	<0.0010		0.0010	mg/L		17-AUG-18	R4175464
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	2.34		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	6.9		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	15.5		0.053	mg/L		28-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	19.9			mg/L		28-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	8.82		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	40		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135780
Turbidity							
Turbidity	0.42		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.59		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	39.8		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	5.4		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	4.4		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0015		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	3.91		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Ra-226	<0.0071		0.0071	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	0.432		0.010	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Mercury (Hg)-Total	0.00077		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.613		0.050	mg/L		16-AUG-18	
Total Organic Carbon	3.68		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0120		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000199		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.00583		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711

* 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
L2131670-7 BRP-34A							
Sampled By: CLIENT on 14-JUL-18 @ 10:30							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Boron (B)-Total	<0.0010		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	0.000073		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000151		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00138		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.0424		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	0.00050		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.00461		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.00354		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.0149		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	0.000057		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	0.00059		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459
L2131670-8 BRP-34B							
Sampled By: CLIENT on 14-JUL-18 @ 11:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Aluminum (Al)-Dissolved	0.00757		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000200		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00566		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	0.0012		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	3.08		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	0.000047		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00110		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	0.0126		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	0.00056		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	1.87		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.00263		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.00321		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.364		0.020	mg/L		21-AUG-18	R4180186

* 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
L2131670-8 BRP-34B							
Sampled By: CLIENT on 14-JUL-18 @ 11:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.710		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.0148		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		21-AUG-18	R4180186
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.202		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	2.74		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.19		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	2.94		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0058		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.299		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0019		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							
Phosphorus (P)-Total	0.0034		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	2.34		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	5.6		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	15.4		0.053	mg/L		28-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	19.9			mg/L		28-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0056		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	8.85		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	32		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135780

* 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
L2131670-8 BRP-34B							
Sampled By: CLIENT on 14-JUL-18 @ 11:00							
Matrix: WATER							
Turbidity							
Turbidity	0.38		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.61		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	39.8		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	5.5		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	4.5		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0020		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	3.76		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Ra-226	<0.0076		0.0076	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	0.439		0.010	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Mercury (Hg)-Total	0.00083		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.304		0.050	mg/L		16-AUG-18	
Total Organic Carbon	3.69		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0121		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000203		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.00590		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Boron (B)-Total	<0.0010		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	0.000083		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000154		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00125		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.0396		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	0.00054		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.00519		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.00329		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.0147		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	0.00059		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459

* 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
L2131670-9 BRP-39							
Sampled By: CLIENT on 14-JUL-18 @ 13:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Aluminum (Al)-Dissolved	0.00406		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000215		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00325		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	2.00		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	0.000035		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00051		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	0.0799		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	1.55		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.00130		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.000848		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.302		0.020	mg/L		21-AUG-18	R4180186
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.603		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.00669		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		21-AUG-18	R4180186
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.190		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	1.65		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.18		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	1.73		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0074		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.346		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0025		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							

* 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
L2131670-9 BRP-39							
Sampled By: CLIENT on 14-JUL-18 @ 13:00							
Matrix: WATER							
Total P in Water by Colour							
Phosphorus (P)-Total	0.0052		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	0.58		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	8.1		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	11.4		0.053	mg/L		28-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	14.2			mg/L		27-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0052		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	5.27		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	19		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135893
Turbidity							
Turbidity	0.68		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.80		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	28.6		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	7.8		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	6.4		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0033		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	4.30		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Ra-226	<0.0080		0.0080	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	0.416		0.010	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Mercury (Hg)-Total	0.00065		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.351		0.050	mg/L		16-AUG-18	
Total Organic Carbon	3.59		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00659		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000220		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.00346		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711

* 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
L2131670-9 BRP-39							
Sampled By: CLIENT on 14-JUL-18 @ 13:00							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Boron (B)-Total	<0.0010		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	0.000078		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000073		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00063		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.148		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	<0.00050		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.00232		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.000944		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.00676		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	0.000050		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459
L2131670-10 BRP-18							
Sampled By: CLIENT on 14-JUL-18 @ 14:30							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Aluminum (Al)-Dissolved	0.0111		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000209		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00975		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	0.0019		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	0.0000136		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	5.40		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	0.000065		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	0.000115		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00150		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	0.0029		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	0.00089		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	2.49		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.000697		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.00469		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.493		0.020	mg/L		21-AUG-18	R4180186

* 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
L2131670-10 BRP-18							
Sampled By: CLIENT on 14-JUL-18 @ 14:30							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.942		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.0287		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	0.00146		0.00080	mg/L		21-AUG-18	R4180186
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.790		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	3.60		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	0.000062		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.75		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	3.70		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.215		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0015		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							
Phosphorus (P)-Total	0.0021		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	6.30		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	3.9		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	23.7		0.053	mg/L		28-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	30.8			mg/L		28-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0793		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	11.9		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	51		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135893

* 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
L2131670-10 BRP-18							
Sampled By: CLIENT on 14-JUL-18 @ 14:30							
Matrix: WATER							
Turbidity							
Turbidity	0.13		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.82		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	62.4		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	6.0		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	4.9		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0014		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	2.45		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Ra-226	<0.0088		0.0088	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	1.79	DLHC	0.050	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Mercury (Hg)-Total	0.00088		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.294		0.050	mg/L		16-AUG-18	
Total Organic Carbon	2.41		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0132		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000209		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.0102		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Boron (B)-Total	0.0016		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	0.0000142		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	0.000076		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000129		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00172		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.0040		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	0.00074		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.000711		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.00468		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.0287		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	0.00163		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	0.00073		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459

* 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
L2131670-11 BRP-18-1							
Sampled By: CLIENT on 14-JUL-18 @ 15:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Aluminum (Al)-Dissolved	0.0113		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000202		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00976		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	0.0020		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	0.0000137		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	5.29		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	0.000103		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00156		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	<0.0010		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	0.00085		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	2.51		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.000535		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.00466		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.489		0.020	mg/L		21-AUG-18	R4180186
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.950		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.0283		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	0.00145		0.00080	mg/L		21-AUG-18	R4180186
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.788		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	3.73		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.76		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	3.73		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0080		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.192		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0036		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							

* 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
L2131670-11 BRP-18-1							
Sampled By: CLIENT on 14-JUL-18 @ 15:00							
Matrix: WATER							
Total P in Water by Colour							
Phosphorus (P)-Total	0.0020		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	6.35		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	3.1		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	23.5		0.053	mg/L		28-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	31.0			mg/L		28-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0765		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	11.8		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	44		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135893
Turbidity							
Turbidity	0.21		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.74		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	63.1		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	6.6		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	5.4		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0020		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	2.58		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Ra-226	<0.0066		0.0066	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	1.79	DLHC	0.050	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Mercury (Hg)-Total	0.00080		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.269		0.050	mg/L		16-AUG-18	
Total Organic Carbon	2.40		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0140		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000211		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.0101		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711

* 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
L2131670-11 BRP-18-1							
Sampled By: CLIENT on 14-JUL-18 @ 15:00							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Boron (B)-Total	0.0016		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	0.0000151		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	0.000075		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000130		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00173		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.0036		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	0.00068		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.000684		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.00469		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.0284		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	0.00180		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	0.00078		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459
L2131670-12 BRP-23							
Sampled By: CLIENT on 14-JUL-18 @ 16:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Aluminum (Al)-Dissolved	0.00990		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000359		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00722		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	0.0014		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	3.61		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	0.000124		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	0.000190		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00121		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	0.129		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	0.00071		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	2.41		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.00560		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.00276		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.322		0.020	mg/L		21-AUG-18	R4180186

* 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
L2131670-12 BRP-23							
Sampled By: CLIENT on 14-JUL-18 @ 16:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.784		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.0155		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	0.000099		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		21-AUG-18	R4180186
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.082		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	3.58		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	0.000061		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	<0.10		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	3.49		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0208		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.481		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0031		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							
Phosphorus (P)-Total	0.0055		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	1.74		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	15.6		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	0.022		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	18.9		0.053	mg/L		28-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	23.7			mg/L		28-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0057		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	10.8		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	61		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135893

* 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
L2131670-12 BRP-23							
Sampled By: CLIENT on 14-JUL-18 @ 16:00							
Matrix: WATER							
Turbidity							
Turbidity	0.75		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.82		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	46.5		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	8.1		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	6.6		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0028		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	4.81		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Ra-226	<0.0077		0.0077	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	0.163		0.010	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Mercury (Hg)-Total	0.00120		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.486		0.050	mg/L		16-AUG-18	
Total Organic Carbon	4.82		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		25-JUL-18	R4140556
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0189		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000401		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.00755		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Boron (B)-Total	0.0010		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	0.0000052		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	0.000153		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000319		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00137		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.236		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	0.000013		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	0.00058		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.00656		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.00283		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.0153		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	0.00026		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	0.000169		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	0.0308		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	0.00097		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459

* 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
L2131670-13 BRP-29-1							
Sampled By: CLIENT on 16-JUL-18 @ 10:30							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Aluminum (Al)-Dissolved	0.0135		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	0.000061		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000256		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00733		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	0.0016		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	0.0000078		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	3.86		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	0.000066		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	0.000176		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00180		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	0.0106		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	0.000016		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	0.00083		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	2.03		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.00321		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.00406		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.417		0.020	mg/L		21-AUG-18	R4180186
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.827		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.0200		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	0.00154		0.00080	mg/L		21-AUG-18	R4180186
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.319		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	2.87		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.34		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	2.89		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0073		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.288		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0020		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							

* 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
L2131670-13 BRP-29-1							
Sampled By: CLIENT on 16-JUL-18 @ 10:30							
Matrix: WATER							
Total P in Water by Colour							
Phosphorus (P)-Total	0.0065		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	3.83		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	6.5		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	18.0		0.053	mg/L		28-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	23.6			mg/L		28-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.148		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	9.38		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	27		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135893
Turbidity							
Turbidity	0.42		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.69		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	46.2		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	5.4		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	4.4		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0022		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	3.58		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		26-JUL-18	R4145075
Ra-226	<0.0090		0.0090	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	0.805	DLHC	0.050	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		26-JUL-18	R4145075
Mercury (Hg)-Total	0.00092		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.436		0.050	mg/L		16-AUG-18	
Total Organic Carbon	3.69		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		28-JUL-18	R4151433
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0178		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	0.000039		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000251		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.00747		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711

* 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
L2131670-13 BRP-29-1							
Sampled By: CLIENT on 16-JUL-18 @ 10:30							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Boron (B)-Total	0.0013		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	0.0000071		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	0.000065		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000222		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00171		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.0293		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	0.000016		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	0.00066		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.00379		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.00406		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.0200		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	0.000056		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	0.00088		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	0.00066		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459
L2131670-14 BRP-29-2							
Sampled By: CLIENT on 16-JUL-18 @ 12:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Aluminum (Al)-Dissolved	0.0117		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	0.000044		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000257		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00704		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	0.0015		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	0.0000069		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	3.62		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	0.000072		0.000060	mg/L		28-AUG-18	R4189547
Cobalt (Co)-Dissolved	0.000184		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00155		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	0.0099		0.0010	mg/L		28-AUG-18	R4189547
Lead (Pb)-Dissolved	0.000014		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	0.00080		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	1.94		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.00389		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.00397		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.390		0.020	mg/L		21-AUG-18	R4180186

* 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
L2131670-14 BRP-29-2							
Sampled By: CLIENT on 16-JUL-18 @ 12:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.749		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.0189		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	0.00082		0.00080	mg/L		28-AUG-18	R4189547
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.324		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	2.97		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.30		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	2.96		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0060		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.268		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0017		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							
Phosphorus (P)-Total	0.0037		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	3.57		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	8.0		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	17.0		0.053	mg/L		29-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	22.0			mg/L		27-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	9.18		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	27		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135893

* 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
L2131670-14 BRP-29-2							
Sampled By: CLIENT on 16-JUL-18 @ 12:00							
Matrix: WATER							
Turbidity							
Turbidity	0.48		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.67		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	44.8		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	5.2		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	4.3		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	3.86		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		26-JUL-18	R4145075
Ra-226	<0.0086		0.0086	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	0.713	DLHC	0.050	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		26-JUL-18	R4145075
Mercury (Hg)-Total	0.00089		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.268		0.050	mg/L		16-AUG-18	
Total Organic Carbon	3.51		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		28-JUL-18	R4151433
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0179		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000259		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.00737		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Boron (B)-Total	0.0012		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	0.0000075		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	0.000070		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000201		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00165		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.0297		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	0.00057		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.00387		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.00396		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.0191		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	0.00013		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	0.000063		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	0.00080		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	0.00068		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459

* 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
L2131670-15 BRP-29-3							
Sampled By: CLIENT on 13-JUL-18 @ 16:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Aluminum (Al)-Dissolved	0.0130		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	0.000032		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000237		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00711		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	0.0016		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	0.0000104		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	3.65		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	0.000066		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	0.000175		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00146		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	0.0106		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	0.00074		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	1.93		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.00346		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.00412		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.394		0.020	mg/L		21-AUG-18	R4180186
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.757		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.0189		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		21-AUG-18	R4180186
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.319		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	2.90		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.29		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	2.81		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0050		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.273		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0016		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							

* 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
L2131670-15 BRP-29-3							
Sampled By: CLIENT on 13-JUL-18 @ 16:00							
Matrix: WATER							
Total P in Water by Colour							
Phosphorus (P)-Total	0.0033		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	3.61		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	7.8		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	17.0		0.053	mg/L		28-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	21.7			mg/L		28-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	8.99		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	49		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135780
Turbidity							
Turbidity	0.43		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.66		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	44.1		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	4.0		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0012		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	3.60		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		24-JUL-18	R4139100
Ra-226	<0.0081		0.0081	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	0.728	DLHC	0.050	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		24-JUL-18	R4139100
Mercury (Hg)-Total	0.00096		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.273		0.050	mg/L		16-AUG-18	
Total Organic Carbon	3.69		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		24-JUL-18	R4139100
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0230		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	0.000126		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000263		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.00774		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711

* 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
L2131670-15 BRP-29-3							
Sampled By: CLIENT on 13-JUL-18 @ 16:00							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Boron (B)-Total	0.0012		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	0.0000067		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	0.000112		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000210		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00195		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.0344		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	0.000013		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	0.00060		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.00440		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.00405		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.0190		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	0.00021		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	0.000063		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	0.00124		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	0.00071		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459
L2131670-16 BRP-29-4							
Sampled By: CLIENT on 16-JUL-18 @ 13:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Aluminum (Al)-Dissolved	0.0123		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	0.000023		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000236		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00704		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	0.0014		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	0.0000067		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	3.61		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	0.000062		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	0.000172		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00147		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	0.0110		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	0.00071		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	1.96		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.00335		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.00390		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.391		0.020	mg/L		21-AUG-18	R4180186

* 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
L2131670-16 BRP-29-4							
Sampled By: CLIENT on 16-JUL-18 @ 13:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.759		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.0188		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	0.00089		0.00080	mg/L		21-AUG-18	R4180186
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.294		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	2.96		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.32		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	2.96		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0107		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.266		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0014		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							
Phosphorus (P)-Total	0.0037		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	3.58		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	6.6		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	17.1		0.13	mg/L		27-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	22.1			mg/L		28-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0088		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	9.15		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	43		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135893

* 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
L2131670-16 BRP-29-4							
Sampled By: CLIENT on 16-JUL-18 @ 13:00							
Matrix: WATER							
Turbidity							
Turbidity	0.42		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.67		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	44.5		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	5.4		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	4.4		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	3.78		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		26-JUL-18	R4145075
Ra-226	<0.0085		0.0085	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	0.641	DLHC	0.050	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		26-JUL-18	R4145075
Mercury (Hg)-Total	0.00091		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.275		0.050	mg/L		16-AUG-18	
Total Organic Carbon	3.60		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		28-JUL-18	R4151433
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0179		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	0.000024		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000246		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.00734		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Boron (B)-Total	0.0012		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	0.0000070		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	0.000080		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000209		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00163		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.0297		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	0.00055		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.00406		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.00393		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.0190		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	0.000057		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	0.00192		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	0.00072		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459

* 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
L2131670-17 BRP-29-5							
Sampled By: CLIENT on 13-JUL-18 @ 11:30							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Aluminum (Al)-Dissolved	0.0125		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	0.000083		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000231		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00722		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	0.0016		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	3.56		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	0.000079		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	0.000148		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00154		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	0.0122		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	0.00073		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	1.94		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.00349		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.00392		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.407		0.020	mg/L		21-AUG-18	R4180186
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.825		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.0185		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	0.00081		0.00080	mg/L		21-AUG-18	R4180186
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.297		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	2.85		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.29		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	2.78		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0074		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.327		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0010		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							

* 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
L2131670-17 BRP-29-5							
Sampled By: CLIENT on 13-JUL-18 @ 11:30							
Matrix: WATER							
Total P in Water by Colour							
Phosphorus (P)-Total	0.0029		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	3.50		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	8.1		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	16.9		0.053	mg/L		28-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	21.7			mg/L		28-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	8.93		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	38		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135780
Turbidity							
Turbidity	0.74		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.63		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	43.6		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	5.1		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	4.2		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	4.17		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		24-JUL-18	R4139100
Ra-226	<0.0063		0.0063	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	0.650	DLHC	0.050	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		24-JUL-18	R4139100
Mercury (Hg)-Total	0.00092		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.327		0.050	mg/L		16-AUG-18	
Total Organic Carbon	3.68		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		24-JUL-18	R4139100
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0235		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	0.000132		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000241		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.00904		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711

* 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
L2131670-17 BRP-29-5							
Sampled By: CLIENT on 13-JUL-18 @ 11:30							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Boron (B)-Total	0.0012		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	0.0000077		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	0.000096		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000202		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00173		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.0395		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	0.000022		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	0.00064		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.00447		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.00395		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.0185		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	0.00037		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	0.000058		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	0.00116		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	0.00068		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459
L2131670-18 BRP-29-6							
Sampled By: CLIENT on 13-JUL-18 @ 13:30							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Aluminum (Al)-Dissolved	0.0286		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	0.000023		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	0.000241		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	0.00829		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	0.0015		0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	0.0000125		0.0000050	mg/L		21-AUG-18	R4180186
Calcium (Ca)-Dissolved	4.30		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	0.000092		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	0.000357		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	0.00190		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	0.0076		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	0.00076		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	2.02		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	0.00449		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	0.00516		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	0.411		0.020	mg/L		21-AUG-18	R4180186

* 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
L2131670-18 BRP-29-6							
Sampled By: CLIENT on 13-JUL-18 @ 13:30							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.743		0.0050	mg/L		21-AUG-18	R4180186
Strontium (Sr)-Dissolved	0.0232		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	0.00178		0.00080	mg/L		21-AUG-18	R4180186
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	0.525		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	2.61		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	0.000076		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.55		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	2.86		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0093		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.343		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0014		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							
Phosphorus (P)-Total	0.0071		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	5.87		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	13.6		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	19.0		0.053	mg/L		28-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	24.6			mg/L		28-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0142		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	8.95		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	34		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135780

* 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
L2131670-18 BRP-29-6							
Sampled By: CLIENT on 13-JUL-18 @ 13:30							
Matrix: WATER							
Turbidity							
Turbidity	0.59		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	6.63		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	51.3		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	3.8		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	4.17		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		24-JUL-18	R4139100
Ra-226	<0.0067		0.0067	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	1.27	DLHC	0.050	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		24-JUL-18	R4139100
Mercury (Hg)-Total	0.00183		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.358		0.050	mg/L		16-AUG-18	
Total Organic Carbon	4.23		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		24-JUL-18	R4139100
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0369		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	0.000243		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	0.00909		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	0.000011		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Boron (B)-Total	0.0013		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	0.0000149		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	0.000119		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	0.000488		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	0.00220		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	0.0298		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	0.00062		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	0.00582		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	0.00583		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	0.0254		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	0.00017		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	0.000011		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	0.000066		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	0.00216		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	0.00143		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459

* 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
L2131670-19 TRIP BLANK							
Sampled By: CLIENT							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					15-AUG-18	R4170158
Aluminum (Al)-Dissolved	<0.00030		0.00030	mg/L		22-AUG-18	R4180522
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		22-AUG-18	R4180522
Arsenic (As)-Dissolved	<0.000020		0.000020	mg/L		22-AUG-18	R4180522
Barium (Ba)-Dissolved	<0.000050		0.000050	mg/L		22-AUG-18	R4180522
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		22-AUG-18	R4180522
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		22-AUG-18	R4180522
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		22-AUG-18	R4180522
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		22-AUG-18	R4180522
Calcium (Ca)-Dissolved	<0.020		0.020	mg/L		22-AUG-18	R4180522
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		22-AUG-18	R4180522
Cobalt (Co)-Dissolved	<0.000010		0.000010	mg/L		22-AUG-18	R4180522
Copper (Cu)-Dissolved	<0.00010		0.00010	mg/L		22-AUG-18	R4180522
Iron (Fe)-Dissolved	<0.0010		0.0010	mg/L		22-AUG-18	R4180522
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		22-AUG-18	R4180522
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		22-AUG-18	R4180522
Magnesium (Mg)-Dissolved	<0.0040		0.0040	mg/L		22-AUG-18	R4180522
Manganese (Mn)-Dissolved	<0.000050		0.000050	mg/L		22-AUG-18	R4180522
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		17-AUG-18	R4175646
Nickel (Ni)-Dissolved	<0.000060		0.000060	mg/L		22-AUG-18	R4180522
Potassium (K)-Dissolved	<0.020		0.020	mg/L		22-AUG-18	R4180522
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		22-AUG-18	R4180522
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		22-AUG-18	R4180522
Sodium (Na)-Dissolved	<0.0050		0.0050	mg/L		22-AUG-18	R4180522
Strontium (Sr)-Dissolved	<0.000050		0.000050	mg/L		22-AUG-18	R4180522
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		22-AUG-18	R4180522
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		22-AUG-18	R4180522
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		22-AUG-18	R4180522
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		22-AUG-18	R4180522
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		22-AUG-18	R4180522
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		22-AUG-18	R4180522
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					15-AUG-18	R4170158
Silicon (Si)-Dissolved	<0.050		0.050	mg/L		15-AUG-18	R4172990
Sulfur (S)-Dissolved	<0.50		0.50	mg/L		15-AUG-18	R4172990
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		15-AUG-18	R4172990
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	<0.10		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	<0.50		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0101	RRV	0.0050	mg/L		08-AUG-18	R4161373
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.116		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	<0.0010		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							
Phosphorus (P)-Total	<0.0010		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							

* 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
L2131670-19 TRIP BLANK							
Sampled By: CLIENT							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	<2.0		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	<0.13		0.13	mg/L		04-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	<1.0			mg/L		04-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	<0.050		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		23-JUL-18	R4139003
Total Dissolved Solids							
Total Dissolved Solids	<10		10	mg/L		22-JUL-18	R4139509
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		21-JUL-18	R4135893
Turbidity							
Turbidity	0.14		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							
pH	5.29		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	<2.0		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	<0.50		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		26-JUL-18	R4145075
Ra-226	<0.0093		0.0093	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	<0.010		0.010	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		26-JUL-18	R4145075
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.116		0.050	mg/L		16-AUG-18	
Total Organic Carbon	<0.50		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		31-JUL-18	R4152474
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	<0.00030		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	<0.000020		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Boron (B)-Total	<0.0010		0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		26-AUG-18	R4184711

* 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
L2131670-19 TRIP BLANK							
Sampled By: CLIENT							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Cobalt (Co)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	<0.00010		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	<0.0010		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	<0.00050		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	<0.000060		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459
L2131670-20 BRP-TBI							
Sampled By: CLIENT on 17-JUL-18 @ 10:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4179373
Aluminum (Al)-Dissolved	<0.00030		0.00030	mg/L		21-AUG-18	R4180186
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		21-AUG-18	R4180186
Arsenic (As)-Dissolved	<0.000020		0.000020	mg/L		21-AUG-18	R4180186
Barium (Ba)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Boron (B)-Dissolved	0.0065	RRV	0.0010	mg/L		21-AUG-18	R4180186
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		22-AUG-18	R4180522
Calcium (Ca)-Dissolved	<0.020		0.020	mg/L		21-AUG-18	R4180186
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Cobalt (Co)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Copper (Cu)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Iron (Fe)-Dissolved	<0.0010		0.0010	mg/L		21-AUG-18	R4180186
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		21-AUG-18	R4180186
Magnesium (Mg)-Dissolved	<0.0040		0.0040	mg/L		21-AUG-18	R4180186
Manganese (Mn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Nickel (Ni)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Potassium (K)-Dissolved	<0.020		0.020	mg/L		21-AUG-18	R4180186
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		21-AUG-18	R4180186
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Sodium (Na)-Dissolved	0.0329	RRV	0.0050	mg/L		21-AUG-18	R4180186

* 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
L2131670-20 BRP-TBI							
Sampled By: CLIENT on 17-JUL-18 @ 10:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Strontium (Sr)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		21-AUG-18	R4180186
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		21-AUG-18	R4180186
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		21-AUG-18	R4180186
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		21-AUG-18	R4180186
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		22-AUG-18	R4180522
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					21-AUG-18	R4178999
Silicon (Si)-Dissolved	<0.050		0.050	mg/L		21-AUG-18	R4180186
Sulfur (S)-Dissolved	<0.50		0.50	mg/L		21-AUG-18	R4180186
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		21-AUG-18	R4180186
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	<0.10		0.10	mg/L		16-AUG-18	R4173929
Sulfur (S)-Total	<0.50		0.50	mg/L		16-AUG-18	R4173929
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		16-AUG-18	R4173929
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		02-AUG-18	R4155554
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.141		0.050	mg/L	15-AUG-18	16-AUG-18	R4173328
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	<0.0010		0.0010	mg/L		16-AUG-18	R4173027
Total P in Water by Colour							
Phosphorus (P)-Total	<0.0010		0.0010	mg/L		16-AUG-18	R4173027
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		20-JUL-18	R4138366
Color, True							
Color, True	<2.0		2.0	C.U.		21-JUL-18	R4135842
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		20-JUL-18	R4138366
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	<0.053		0.053	mg/L		28-AUG-18	
Ion Balance Calculation							
TDS (Calculated)	<1.0			mg/L		28-AUG-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		20-JUL-18	R4138366
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		20-JUL-18	R4138366
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	<0.050		0.050	mg/L		20-JUL-18	R4138366
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		21-JUL-18	R4136631
Total Dissolved Solids							
Total Dissolved Solids	<10		10	mg/L		24-JUL-18	R4142827
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		24-JUL-18	R4139907
Turbidity							
Turbidity	0.39		0.10	NTU		20-JUL-18	R4134247
pH, Conductivity and Total Alkalinity							

* 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
L2131670-20 BRP-TBI							
Sampled By: CLIENT on 17-JUL-18 @ 10:00							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
pH	5.12		0.10	pH		30-JUL-18	R4148632
Conductivity (EC)	<2.0		2.0	uS/cm		30-JUL-18	R4148632
Bicarbonate (HCO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Carbonate (CO3)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Hydroxide (OH)	<5.0		5.0	mg/L		30-JUL-18	R4148632
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		30-JUL-18	R4148632
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		21-JUL-18	R4135572
Dissolved Organic Carbon	<0.50		0.50	mg/L		15-AUG-18	R4172341
Cyanide, Free	<0.0050		0.0050	mg/L		26-JUL-18	R4145075
Ra-226	0.014		0.0080	Bq/L	07-AUG-18	16-AUG-18	R4160854
Silicate (as SiO2)	<0.010		0.010	mg/L		29-JUL-18	R4146086
Cyanide, Total	<0.0050		0.0050	mg/L		26-JUL-18	R4145075
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		24-JUL-18	R4139515
Total Nitrogen	0.141		0.050	mg/L		16-AUG-18	
Total Organic Carbon	<0.50		0.50	mg/L		15-AUG-18	R4172270
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		28-JUL-18	R4151433
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	<0.00030		0.00030	mg/L		26-AUG-18	R4184711
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		26-AUG-18	R4184711
Arsenic (As)-Total	<0.000020		0.000020	mg/L		26-AUG-18	R4184711
Barium (Ba)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Boron (B)-Total	0.0062	RRV	0.0010	mg/L		26-AUG-18	R4184711
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		26-AUG-18	R4184711
Cobalt (Co)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Copper (Cu)-Total	<0.00010		0.00010	mg/L		26-AUG-18	R4184711
Iron (Fe)-Total	<0.0010		0.0010	mg/L		26-AUG-18	R4184711
Lead (Pb)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Lithium (Li)-Total	<0.00050		0.00050	mg/L		26-AUG-18	R4184711
Manganese (Mn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Nickel (Ni)-Total	<0.000060		0.000060	mg/L		26-AUG-18	R4184711
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-AUG-18	R4184711
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Strontium (Sr)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-AUG-18	R4184711
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		26-AUG-18	R4184711
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-AUG-18	R4184711
Vanadium (V)-Total	<0.000050		0.000050	mg/L		26-AUG-18	R4184711
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		26-AUG-18	R4184711
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					02-AUG-18	R4155133
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	02-AUG-18	07-AUG-18	R4160459

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-DOC-HTC-WP	Water	Dissolved Organic Carbon by Combustion	APHA 5310 B-WP

Filtered (0.45 um) sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.

C-TOC-HTC-WP	Water	Total Organic Carbon by Combustion	APHA 5310 B-WP

Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer.

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

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

CN-FREE-CFA-VA	Water	Free Cyanide in water by CFA	ASTM 7237

This analysis is carried out using procedures adapted from ASTM Method 7237 "Free Cyanide with Flow Injection Analysis (FIA) Utilizing Gas Diffusion Separation and Amperometric Detection". Free cyanide is determined by in-line gas diffusion at pH 6 with final determination by colourimetric analysis.

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

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

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

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

COL-TRU-ED	Water	Color, True	APHA 2120

True Colour is measured using a colorimeter by comparison to platinum-cobalt standards using the single wavelength method (450 - 465 nm) after filtration of sample through a 0.45 um filter. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Concurrent measurement of sample pH is recommended.

ETL-HARDNESS-DIS-ED	Water	Hardness (from Dissolved Ca and Mg)	APHA 2340 B-Calculation
F-IC-N-ED	Water	Fluoride in Water by IC	EPA 300.1 (mod)

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

HG-D-U-CVAF-VA	Water	Diss. Mercury in Water by CVAFS (Ultra)	APHA 3030 B / EPA 1631 REV. E

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency (EPA). The procedure may involve preliminary sample treatment by filtration (APHA 3030B) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry.

HG-T-U-CVAF-VA	Water	Total Mercury in Water by CVAFS (Ultra)	EPA 1631 REV. E

This analysis is carried out using procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry.

IONBALANCE-ED	Water	Ion Balance Calculation	APHA 1030E
MET-D-CCMS-ED	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)

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

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

MET-D-NP-U-CCMS-ED	Water	Diss. Metals in Water by CRC ICPMS (Ult)	APHA 3125-ICP-MS

Ultra trace metals in water are analyzed by ICPMS, based on US EPA Method 6020A (Jan 1998). This procedure is intended for pristine field-filtered acid-preserved water samples. ALS recommends that filtration blanks be submitted for this test to aid with interpretation of results.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
MET-T-CCMS-ED	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

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

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

MET-T-NP-U-CCMS-ED	Water	Metals in Water by CRC ICPMS (No Digest)	APHA 3125-ICP-MS

Ultra trace metals in water are analyzed by ICPMS, based on US EPA Method 6020A (Jan 1998). The detection limits provided can only be met for undigested samples. This procedure is intended for pristine, non-turbid, acid-preserved water samples, where sample turbidity is < 1 NTU. Where turbidity exceeds 1 NTU, results may be biased low compared to true Total Metals concentrations. ALS recommends that turbidity analysis be requested on samples submitted for this test to aid with interpretation of results.

N-T-CALC-ED	Water	Total Nitrogen (Calculation)	APHA 4500 N-Calculated

Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)]

NH3-L-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.

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

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

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

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

P-T-L-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

P-TD-L-COL-ED	Water	Total Dissolved P in Water by Colour	APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Dissolved Phosphorous is determined colourimetrically after persulphate digestion of a sample that has been lab or field filtered through a 0.45 micron membrane filter.

PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320

All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed).
pH measurement is determined from the activity of the hydrogen ions using a hydrogen electrode and a reference electrode.
Alkalinity measurement is based on the sample's capacity to neutralize acid. Auto-titration to pH 4.5 using 0.02N H_2SO_4 is performed.
Conductivity measurement is based on the sample's capacity to convey an electric current, and is measured with a conductivity meter.

PO4-DO-L-COL-ED	Water	Diss. Orthophosphate in Water 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.

RA226-MMER-FC	Water	Ra226 by Alpha Scint, MDC=0.01 Bq/L	EPA 903.1
SILICATE-L-COL-ED	Water	Reactive Silica by Colour	APHA 4500-SiO_2 E.

This analysis is carried out using procedures adapted from APHA Method 4500-SiO_2 E. "Silica". Silicate (molybdate-reactive silica) is determined by the molybdosilicate-heteropoly blue colourimetric method.

SO4-L-IC-N-ED	Water	Sulfate in Water by IC (Low Level)	EPA 300.1 (mod)

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

SOLIDS-TDS-ED	Water	Total Dissolved Solids	APHA 2540 C

Gravimetric determination of solids in waters by filtration and evaporating filtrate to dryness at 180 degrees Celsius.

SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric

Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.

SULPHIDE-CFA-ED	Water	Sulphide	APHA 4500 -S E-Auto-Colorimetry

A continuous flow manifold adds HCl to the sample which converts sulphide to a gas, then the sulphide is separated from the flow using a gas dialysis membrane. A Colorimetric reaction produces a methylene blue compound which is measured at 660 nm. This follows the Standard Methods procedure 4500 S-E.

TKN-L-CFA-ED	Water	TKN in Water by Colour	APHA 4500-NORG (TKN)

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 celcius with analysis using an automated colourimetric finish.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer

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

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

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

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA
FC	ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA

Chain of Custody Numbers:

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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

Workorder: L2131670 Report Date: 04-SEP-18

Client: GOLDER ASSOCIATES LTD
16820 107 Ave NW
EDMONTON AB T5P 4C3
Contact: Zenovia Craciunescu / Kerrie Serbin

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-DOC-HTC-WP	**Water**							
Batch R4168503								
WG2848510-2 LCS								
Dissolved Organic Carbon			94.9		%		80-120	12-AUG-18
WG2848510-1 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	12-AUG-18
WG2848510-4 MS		**L2131670-1**						
Dissolved Organic Carbon			96.9		%		70-130	12-AUG-18
Batch R4172341								
WG2851176-3 DUP		**L2131670-17**						
Dissolved Organic Carbon		4.17	4.14		mg/L	0.7	20	15-AUG-18
WG2851176-2 LCS								
Dissolved Organic Carbon			96.0		%		80-120	15-AUG-18
WG2851176-1 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	15-AUG-18
WG2851176-4 MS		**L2131670-18**						
Dissolved Organic Carbon			93.6		%		70-130	15-AUG-18
Batch R4179323								
WG2855482-2 LCS								
Dissolved Organic Carbon			100.9		%		80-120	20-AUG-18
WG2855482-1 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	20-AUG-18
C-TOC-HTC-WP	**Water**							
Batch R4168499								
WG2848521-2 LCS								
Total Organic Carbon			94.1		%		80-120	12-AUG-18
WG2848521-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	12-AUG-18
WG2848521-4 MS		**L2131670-1**						
Total Organic Carbon			94.0		%		70-130	12-AUG-18
Batch R4172270								
WG2851218-3 DUP		**L2131670-2**						
Total Organic Carbon		3.02	3.05		mg/L	1.0	20	15-AUG-18
WG2851218-2 LCS								
Total Organic Carbon			92.1		%		80-120	15-AUG-18
WG2851218-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	15-AUG-18
WG2851218-4 MS		**L2131670-3**						
Total Organic Carbon			96.4		%		70-130	15-AUG-18
CL-IC-N-ED	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-IC-N-ED	**Water**							
Batch R4138366								
WG2828484-3 DUP		**L2131670-20**						
Chloride (Cl)		<0.50	<0.50	RPD-NA	mg/L	N/A	20	20-JUL-18
WG2828484-11 LCS								
Chloride (Cl)			100.5		%		90-110	20-JUL-18
WG2828484-13 LCS								
Chloride (Cl)			100.4		%		90-110	20-JUL-18
WG2828484-15 LCS								
Chloride (Cl)			99.97		%		90-110	21-JUL-18
WG2828484-2 LCS								
Chloride (Cl)			102.3		%		90-110	20-JUL-18
WG2828484-1 MB								
Chloride (Cl)			<0.50		mg/L		0.5	20-JUL-18
WG2828484-12 MB								
Chloride (Cl)			<0.50		mg/L		0.5	20-JUL-18
WG2828484-16 MB								
Chloride (Cl)			<0.50		mg/L		0.5	21-JUL-18
WG2828484-4 MS		**L2131670-20**						
Chloride (Cl)			101.3		%		75-125	20-JUL-18
CN-FREE-CFA-VA	**Water**							
Batch R4139100								
WG2830758-7 LCS								
Cyanide, Free			97.5		%		80-120	24-JUL-18
WG2830758-6 MB								
Cyanide, Free			<0.0050		mg/L		0.005	24-JUL-18
Batch R4140556								
WG2831873-12 LCS								
Cyanide, Free			96.7		%		80-120	25-JUL-18
WG2831873-7 LCS								
Cyanide, Free			97.9		%		80-120	25-JUL-18
WG2831873-11 MB								
Cyanide, Free			<0.0050		mg/L		0.005	25-JUL-18
WG2831873-6 MB								
Cyanide, Free			<0.0050		mg/L		0.005	25-JUL-18
Batch R4145075								
WG2833087-15 DUP		**L2131670-19**						
Cyanide, Free		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	26-JUL-18
WG2833087-3 DUP		**L2131670-6**						
Cyanide, Free		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	26-JUL-18



Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-FREE-CFA-VA	**Water**							
Batch R4145075								
WG2833087-12 LCS								
Cyanide, Free			98.9		%		80-120	26-JUL-18
WG2833087-2 LCS								
Cyanide, Free			97.6		%		80-120	26-JUL-18
WG2833087-7 LCS								
Cyanide, Free			97.0		%		80-120	26-JUL-18
WG2833087-1 MB								
Cyanide, Free			<0.0050		mg/L		0.005	26-JUL-18
WG2833087-11 MB								
Cyanide, Free			<0.0050		mg/L		0.005	26-JUL-18
WG2833087-6 MB								
Cyanide, Free			<0.0050		mg/L		0.005	26-JUL-18
WG2833087-14 MS		**L2131670-19**						
Cyanide, Free			97.9		%		75-125	26-JUL-18
WG2833087-4 MS		**L2131670-6**						
Cyanide, Free			97.1		%		75-125	26-JUL-18
CN-T-CFA-VA	**Water**							
Batch R4139100								
WG2830758-7 LCS								
Cyanide, Total			94.8		%		80-120	24-JUL-18
WG2830758-6 MB								
Cyanide, Total			<0.0050		mg/L		0.005	24-JUL-18
Batch R4140556								
WG2831873-12 LCS								
Cyanide, Total			96.7		%		80-120	25-JUL-18
Cyanide, Total			96.7		%		80-120	25-JUL-18
WG2831873-7 LCS								
Cyanide, Total			94.2		%		80-120	25-JUL-18
WG2831873-11 MB								
Cyanide, Total			<0.0050		mg/L		0.005	25-JUL-18
Cyanide, Total			<0.0050		mg/L		0.005	25-JUL-18
WG2831873-6 MB								
Cyanide, Total			<0.0050		mg/L		0.005	25-JUL-18
Batch R4145075								
WG2833087-15 DUP		**L2131670-19**						
Cyanide, Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	26-JUL-18
WG2833087-3 DUP		**L2131670-6**						
Cyanide, Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	26-JUL-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-T-CFA-VA	**Water**							
Batch R4145075								
WG2833087-12 LCS								
Cyanide, Total			94.9		%		80-120	26-JUL-18
WG2833087-2 LCS								
Cyanide, Total			95.8		%		80-120	26-JUL-18
WG2833087-7 LCS								
Cyanide, Total			95.3		%		80-120	26-JUL-18
WG2833087-1 MB								
Cyanide, Total			<0.0050		mg/L		0.005	26-JUL-18
WG2833087-11 MB								
Cyanide, Total			<0.0050		mg/L		0.005	26-JUL-18
WG2833087-6 MB								
Cyanide, Total			<0.0050		mg/L		0.005	26-JUL-18
WG2833087-14 MS		**L2131670-19**						
Cyanide, Total			94.9		%		75-125	26-JUL-18
WG2833087-4 MS		**L2131670-6**						
Cyanide, Total			94.9		%		75-125	26-JUL-18
CN-WAD-CFA-VA	**Water**							
Batch R4139100								
WG2830758-7 LCS								
Cyanide, Weak Acid Diss			98.3		%		80-120	24-JUL-18
WG2830758-6 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	24-JUL-18
Batch R4140556								
WG2831873-12 LCS								
Cyanide, Weak Acid Diss			98.4		%		80-120	25-JUL-18
WG2831873-7 LCS								
Cyanide, Weak Acid Diss			96.6		%		80-120	25-JUL-18
WG2831873-11 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	25-JUL-18
WG2831873-6 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	25-JUL-18
Batch R4151433								
WG2835330-3 DUP		**L2131670-13**						
Cyanide, Weak Acid Diss		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	28-JUL-18
WG2835330-8 DUP		**L2131670-20**						
Cyanide, Weak Acid Diss		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	28-JUL-18
WG2835330-2 LCS								
Cyanide, Weak Acid Diss			101.0		%		80-120	28-JUL-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-WAD-CFA-VA	**Water**							
Batch R4151433								
WG2835330-7 LCS								
Cyanide, Weak Acid Diss			98.0		%		80-120	28-JUL-18
WG2835330-1 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	28-JUL-18
WG2835330-6 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	28-JUL-18
WG2835330-4 MS		**L2131670-13**						
Cyanide, Weak Acid Diss			95.5		%		75-125	28-JUL-18
WG2835330-9 MS		**L2131670-20**						
Cyanide, Weak Acid Diss			95.0		%		75-125	28-JUL-18
Batch R4152474								
WG2838102-2 LCS								
Cyanide, Weak Acid Diss			97.7		%		80-120	31-JUL-18
WG2838102-1 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	31-JUL-18
COL-TRU-ED	**Water**							
Batch R4135842								
WG2829133-3 DUP		**L2131670-1**						
Color, True		<2.0	<2.0	RPD-NA	C.U.	N/A	20	21-JUL-18
WG2829133-2 LCS								
Color, True			93.0		%		85-115	21-JUL-18
WG2829133-1 MB								
Color, True			<2.0		C.U.		2	21-JUL-18
F-IC-N-ED	**Water**							
Batch R4138366								
WG2828484-3 DUP		**L2131670-20**						
Fluoride (F)		<0.020	<0.020	RPD-NA	mg/L	N/A	20	20-JUL-18
WG2828484-11 LCS								
Fluoride (F)			102.2		%		90-110	20-JUL-18
WG2828484-13 LCS								
Fluoride (F)			103.1		%		90-110	20-JUL-18
WG2828484-15 LCS								
Fluoride (F)			100.3		%		90-110	21-JUL-18
WG2828484-2 LCS								
Fluoride (F)			97.6		%		90-110	20-JUL-18
WG2828484-1 MB								
Fluoride (F)			<0.020		mg/L		0.02	20-JUL-18
WG2828484-12 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-ED	**Water**							
Batch R4138366								
WG2828484-12 MB								
Fluoride (F)			<0.020		mg/L		0.02	20-JUL-18
WG2828484-14 MB								
Fluoride (F)			<0.020		mg/L		0.02	20-JUL-18
WG2828484-16 MB								
Fluoride (F)			<0.020		mg/L		0.02	21-JUL-18
WG2828484-4 MS		**L2131670-20**						
Fluoride (F)			102.1		%		75-125	20-JUL-18
HG-D-U-CVAF-VA	**Water**							
Batch R4160459								
WG2840000-3 DUP		**L2131670-1**						
Mercury (Hg)-Dissolved		<0.00050	<0.00050	RPD-NA	ug/L	N/A	20	07-AUG-18
WG2840000-2 LCS								
Mercury (Hg)-Dissolved			100.0		%		80-120	07-AUG-18
WG2842645-2 LCS								
Mercury (Hg)-Dissolved			100.0		%		80-120	07-AUG-18
WG2840000-1 MB		**NP**						
Mercury (Hg)-Dissolved			<0.00050		ug/L		0.0005	07-AUG-18
WG2842645-1 MB								
Mercury (Hg)-Dissolved			<0.00050		ug/L		0.0005	07-AUG-18
WG2840000-4 MS		**L2131670-2**						
Mercury (Hg)-Dissolved			96.1		%		70-130	07-AUG-18
HG-T-U-CVAF-VA	**Water**							
Batch R4139515								
WG2831316-3 DUP		**L2131670-20**						
Mercury (Hg)-Total		<0.00050	<0.00050	RPD-NA	ug/L	N/A	20	24-JUL-18
WG2831316-2 LCS								
Mercury (Hg)-Total			105.0		%		80-120	24-JUL-18
WG2831316-1 MB								
Mercury (Hg)-Total			<0.00050		ug/L		0.0005	24-JUL-18
MET-D-CCMS-ED	**Water**							
Batch R4172990								
WG2850540-2 LCS								
Silicon (Si)-Dissolved			114.6		%		80-120	15-AUG-18
Sulfur (S)-Dissolved			101.3		%		80-120	15-AUG-18
Zirconium (Zr)-Dissolved			98.4		%		80-120	15-AUG-18
WG2850540-1 MB								
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	15-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-ED	**Water**							
Batch R4172990								
WG2850540-1 MB								
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	15-AUG-18
Zirconium (Zr)-Dissolved			<0.000060		mg/L		0.00006	15-AUG-18
Batch R4180186								
WG2855204-3 DUP		**L2131670-18**						
Silicon (Si)-Dissolved		0.525	0.527		mg/L	0.4	20	21-AUG-18
Sulfur (S)-Dissolved		2.61	2.86		mg/L	8.9	20	21-AUG-18
Zirconium (Zr)-Dissolved		0.000076	0.000074		mg/L	3.0	20	21-AUG-18
WG2855204-2 LCS								
Silicon (Si)-Dissolved			111.5		%		80-120	21-AUG-18
Sulfur (S)-Dissolved			101.8		%		80-120	21-AUG-18
Zirconium (Zr)-Dissolved			101.5		%		80-120	21-AUG-18
WG2855204-1 MB								
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	21-AUG-18
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	21-AUG-18
Zirconium (Zr)-Dissolved			<0.000060		mg/L		0.00006	21-AUG-18
WG2855204-4 MS		**L2131670-20**						
Silicon (Si)-Dissolved			107.3		%		70-130	21-AUG-18
Sulfur (S)-Dissolved			101.4		%		70-130	21-AUG-18
Zirconium (Zr)-Dissolved			112.1		%		70-130	21-AUG-18
MET-D-NP-U-CCMS-ED	**Water**							
Batch R4175646								
WG2852222-2 LCS								
Molybdenum (Mo)-Dissolved			98.0		%		80-120	17-AUG-18
WG2852222-1 MB								
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	17-AUG-18
Batch R4180186								
WG2855204-3 DUP		**L2131670-18**						
Aluminum (Al)-Dissolved		0.0286	0.0306		mg/L	7.0	20	21-AUG-18
Antimony (Sb)-Dissolved		0.000023	0.000023		mg/L	1.1	20	21-AUG-18
Arsenic (As)-Dissolved		0.000241	0.000240		mg/L	0.6	20	21-AUG-18
Barium (Ba)-Dissolved		0.00829	0.00850		mg/L	2.5	20	21-AUG-18
Beryllium (Be)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	21-AUG-18
Bismuth (Bi)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	21-AUG-18
Boron (B)-Dissolved		0.0015	0.0015		mg/L	0.1	20	21-AUG-18
Cadmium (Cd)-Dissolved		0.0000125	0.0000135		mg/L	7.9	20	21-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch	**R4180186**							
WG2855204-3	**DUP**	**L2131670-18**						
Calcium (Ca)-Dissolved		4.30	4.31		mg/L	0.3	20	21-AUG-18
Chromium (Cr)-Dissolved		0.000092	0.000085		mg/L	7.3	20	21-AUG-18
Cobalt (Co)-Dissolved		0.000357	0.000365		mg/L	2.3	20	21-AUG-18
Copper (Cu)-Dissolved		0.00190	0.00192		mg/L	1.0	20	21-AUG-18
Iron (Fe)-Dissolved		0.0076	0.0082		mg/L	7.8	20	21-AUG-18
Lead (Pb)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	21-AUG-18
Lithium (Li)-Dissolved		0.00076	0.00076		mg/L	0.5	20	21-AUG-18
Magnesium (Mg)-Dissolved		2.02	2.03		mg/L	0.8	20	21-AUG-18
Manganese (Mn)-Dissolved		0.00449	0.00456		mg/L	1.7	20	21-AUG-18
Molybdenum (Mo)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	21-AUG-18
Nickel (Ni)-Dissolved		0.00516	0.00514		mg/L	0.4	20	21-AUG-18
Potassium (K)-Dissolved		0.411	0.417		mg/L	1.3	20	21-AUG-18
Selenium (Se)-Dissolved		<0.000040	<0.000040	RPD-NA	mg/L	N/A	20	21-AUG-18
Silver (Ag)-Dissolved		<0.0000050	<0.000005(	RPD-NA	mg/L	N/A	20	21-AUG-18
Sodium (Na)-Dissolved		0.743	0.758		mg/L	2.0	20	21-AUG-18
Strontium (Sr)-Dissolved		0.0232	0.0238		mg/L	2.7	20	21-AUG-18
Thallium (Tl)-Dissolved		<0.0000050	<0.000005(	RPD-NA	mg/L	N/A	20	21-AUG-18
Tin (Sn)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	21-AUG-18
Titanium (Ti)-Dissolved		<0.00010	0.00011	RPD-NA	mg/L	N/A	20	21-AUG-18
Uranium (U)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	21-AUG-18
Vanadium (V)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	21-AUG-18
Zinc (Zn)-Dissolved		0.00178	0.00170		mg/L	4.8	20	21-AUG-18
WG2855204-2	**LCS**							
Aluminum (Al)-Dissolved			107.1		%		80-120	21-AUG-18
Antimony (Sb)-Dissolved			99.7		%		80-120	21-AUG-18
Arsenic (As)-Dissolved			102.5		%		80-120	21-AUG-18
Barium (Ba)-Dissolved			104.4		%		80-120	21-AUG-18
Beryllium (Be)-Dissolved			101.7		%		80-120	21-AUG-18
Bismuth (Bi)-Dissolved			99.2		%		80-120	21-AUG-18
Boron (B)-Dissolved			101.2		%		80-120	21-AUG-18
Cadmium (Cd)-Dissolved			102.4		%		80-120	21-AUG-18
Calcium (Ca)-Dissolved			103.6		%		80-120	21-AUG-18
Chromium (Cr)-Dissolved			103.7		%		80-120	21-AUG-18
Cobalt (Co)-Dissolved			101.9		%		80-120	21-AUG-18

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Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch	**R4180186**							
WG2855204-2	**LCS**							
Copper (Cu)-Dissolved			98.9		%		80-120	21-AUG-18
Iron (Fe)-Dissolved			103.2		%		80-120	21-AUG-18
Lead (Pb)-Dissolved			98.4		%		80-120	21-AUG-18
Lithium (Li)-Dissolved			99.6		%		80-120	21-AUG-18
Magnesium (Mg)-Dissolved			102.9		%		80-120	21-AUG-18
Manganese (Mn)-Dissolved			101.1		%		80-120	21-AUG-18
Molybdenum (Mo)-Dissolved			103.2		%		80-120	21-AUG-18
Nickel (Ni)-Dissolved			101.8		%		80-120	21-AUG-18
Potassium (K)-Dissolved			102.7		%		80-120	21-AUG-18
Selenium (Se)-Dissolved			106.1		%		80-120	21-AUG-18
Silver (Ag)-Dissolved			101.1		%		80-120	21-AUG-18
Sodium (Na)-Dissolved			103.9		%		80-120	21-AUG-18
Strontium (Sr)-Dissolved			101.9		%		80-120	21-AUG-18
Thallium (Tl)-Dissolved			98.8		%		80-120	21-AUG-18
Tin (Sn)-Dissolved			100.6		%		80-120	21-AUG-18
Titanium (Ti)-Dissolved			97.7		%		80-120	21-AUG-18
Uranium (U)-Dissolved			96.9		%		80-120	21-AUG-18
Vanadium (V)-Dissolved			102.4		%		80-120	21-AUG-18
Zinc (Zn)-Dissolved			98.9		%		80-120	21-AUG-18
WG2855204-1	**MB**							
Aluminum (Al)-Dissolved			<0.00030		mg/L		0.0003	21-AUG-18
Antimony (Sb)-Dissolved			<0.000020		mg/L		0.00002	21-AUG-18
Arsenic (As)-Dissolved			<0.000020		mg/L		0.00002	21-AUG-18
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	21-AUG-18
Beryllium (Be)-Dissolved			<0.000010		mg/L		0.00001	21-AUG-18
Bismuth (Bi)-Dissolved			<0.000010		mg/L		0.00001	21-AUG-18
Boron (B)-Dissolved			<0.0010		mg/L		0.001	21-AUG-18
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	21-AUG-18
Calcium (Ca)-Dissolved			<0.020		mg/L		0.02	21-AUG-18
Chromium (Cr)-Dissolved			<0.000060		mg/L		0.00006	21-AUG-18
Cobalt (Co)-Dissolved			<0.000010		mg/L		0.00001	21-AUG-18
Copper (Cu)-Dissolved			<0.00010		mg/L		0.0001	21-AUG-18
Iron (Fe)-Dissolved			<0.0010		mg/L		0.001	21-AUG-18
Lead (Pb)-Dissolved			<0.000010		mg/L		0.00001	21-AUG-18

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Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch R4180186								
WG2855204-1 MB								
Lithium (Li)-Dissolved			<0.00050		mg/L		0.0005	21-AUG-18
Magnesium (Mg)-Dissolved			<0.0040		mg/L		0.004	21-AUG-18
Manganese (Mn)-Dissolved			<0.000050		mg/L		0.00005	21-AUG-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	21-AUG-18
Nickel (Ni)-Dissolved			<0.000060		mg/L		0.00006	21-AUG-18
Potassium (K)-Dissolved			<0.020		mg/L		0.02	21-AUG-18
Selenium (Se)-Dissolved			<0.000040		mg/L		0.00004	21-AUG-18
Silver (Ag)-Dissolved			<0.000005C		mg/L		0.000005	21-AUG-18
Sodium (Na)-Dissolved			<0.0050		mg/L		0.005	21-AUG-18
Strontium (Sr)-Dissolved			<0.000050		mg/L		0.00005	21-AUG-18
Thallium (Tl)-Dissolved			<0.000005C		mg/L		0.000005	21-AUG-18
Tin (Sn)-Dissolved			<0.000050		mg/L		0.00005	21-AUG-18
Titanium (Ti)-Dissolved			<0.00010		mg/L		0.0001	21-AUG-18
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	21-AUG-18
Vanadium (V)-Dissolved			<0.000050		mg/L		0.00005	21-AUG-18
Zinc (Zn)-Dissolved			<0.00080		mg/L		0.0008	21-AUG-18
WG2855204-4 MS		**L2131670-20**						
Aluminum (Al)-Dissolved			103.9		%		70-130	21-AUG-18
Antimony (Sb)-Dissolved			113.3		%		70-130	21-AUG-18
Arsenic (As)-Dissolved			103.2		%		70-130	21-AUG-18
Barium (Ba)-Dissolved			102.6		%		70-130	21-AUG-18
Beryllium (Be)-Dissolved			101.3		%		70-130	21-AUG-18
Bismuth (Bi)-Dissolved			96.0		%		70-130	21-AUG-18
Boron (B)-Dissolved			109.3		%		70-130	21-AUG-18
Calcium (Ca)-Dissolved			102.5		%		70-130	21-AUG-18
Chromium (Cr)-Dissolved			103.7		%		70-130	21-AUG-18
Cobalt (Co)-Dissolved			103.2		%		70-130	21-AUG-18
Copper (Cu)-Dissolved			103.5		%		70-130	21-AUG-18
Iron (Fe)-Dissolved			101.1		%		70-130	21-AUG-18
Lead (Pb)-Dissolved			98.7		%		70-130	21-AUG-18
Lithium (Li)-Dissolved			100.1		%		70-130	21-AUG-18
Magnesium (Mg)-Dissolved			102.9		%		70-130	21-AUG-18
Manganese (Mn)-Dissolved			102.7		%		70-130	21-AUG-18
Molybdenum (Mo)-Dissolved			109.1		%		70-130	21-AUG-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch R4180186								
WG2855204-4 MS		**L2131670-20**						
Nickel (Ni)-Dissolved			102.9		%		70-130	21-AUG-18
Potassium (K)-Dissolved			101.8		%		70-130	21-AUG-18
Selenium (Se)-Dissolved			106.0		%		70-130	21-AUG-18
Silver (Ag)-Dissolved			111.0		%		70-130	21-AUG-18
Sodium (Na)-Dissolved			104.4		%		70-130	21-AUG-18
Strontium (Sr)-Dissolved			101.9		%		70-130	21-AUG-18
Thallium (Tl)-Dissolved			100.9		%		70-130	21-AUG-18
Tin (Sn)-Dissolved			109.1		%		70-130	21-AUG-18
Titanium (Ti)-Dissolved			110.2		%		70-130	21-AUG-18
Uranium (U)-Dissolved			97.7		%		70-130	21-AUG-18
Vanadium (V)-Dissolved			101.5		%		70-130	21-AUG-18
Batch R4180522								
WG2855629-2 LCS								
Aluminum (Al)-Dissolved			85.7		%		80-120	22-AUG-18
Antimony (Sb)-Dissolved			92.2		%		80-120	22-AUG-18
Arsenic (As)-Dissolved			85.2		%		80-120	22-AUG-18
Barium (Ba)-Dissolved			91.5		%		80-120	22-AUG-18
Beryllium (Be)-Dissolved			96.9		%		80-120	22-AUG-18
Bismuth (Bi)-Dissolved			92.6		%		80-120	22-AUG-18
Boron (B)-Dissolved			97.5		%		80-120	22-AUG-18
Cadmium (Cd)-Dissolved			88.3		%		80-120	22-AUG-18
Calcium (Ca)-Dissolved			94.1		%		80-120	22-AUG-18
Chromium (Cr)-Dissolved			84.2		%		80-120	22-AUG-18
Cobalt (Co)-Dissolved			85.5		%		80-120	22-AUG-18
Copper (Cu)-Dissolved			84.6		%		80-120	22-AUG-18
Iron (Fe)-Dissolved			87.6		%		80-120	22-AUG-18
Lead (Pb)-Dissolved			93.2		%		80-120	22-AUG-18
Lithium (Li)-Dissolved			93.9		%		80-120	22-AUG-18
Magnesium (Mg)-Dissolved			83.4		%		80-120	22-AUG-18
Manganese (Mn)-Dissolved			87.7		%		80-120	22-AUG-18
Molybdenum (Mo)-Dissolved			93.4		%		80-120	22-AUG-18
Nickel (Ni)-Dissolved			84.8		%		80-120	22-AUG-18
Potassium (K)-Dissolved			86.8		%		80-120	22-AUG-18
Selenium (Se)-Dissolved			100.4		%		80-120	22-AUG-18

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Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch R4180522								
WG2855629-2 LCS								
Silver (Ag)-Dissolved			94.9		%		80-120	22-AUG-18
Sodium (Na)-Dissolved			86.5		%		80-120	22-AUG-18
Strontium (Sr)-Dissolved			94.8		%		80-120	22-AUG-18
Thallium (Tl)-Dissolved			93.0		%		80-120	22-AUG-18
Tin (Sn)-Dissolved			88.3		%		80-120	22-AUG-18
Titanium (Ti)-Dissolved			83.6		%		80-120	22-AUG-18
Uranium (U)-Dissolved			95.6		%		80-120	22-AUG-18
Vanadium (V)-Dissolved			87.4		%		80-120	22-AUG-18
Zinc (Zn)-Dissolved			82.6		%		80-120	22-AUG-18
WG2855629-1 MB								
Aluminum (Al)-Dissolved			<0.00030		mg/L		0.0003	22-AUG-18
Antimony (Sb)-Dissolved			<0.000020		mg/L		0.00002	22-AUG-18
Arsenic (As)-Dissolved			<0.000020		mg/L		0.00002	22-AUG-18
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	22-AUG-18
Beryllium (Be)-Dissolved			<0.000010		mg/L		0.00001	22-AUG-18
Bismuth (Bi)-Dissolved			<0.000010		mg/L		0.00001	22-AUG-18
Boron (B)-Dissolved			<0.0010		mg/L		0.001	22-AUG-18
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	22-AUG-18
Calcium (Ca)-Dissolved			<0.020		mg/L		0.02	22-AUG-18
Chromium (Cr)-Dissolved			<0.000060		mg/L		0.00006	22-AUG-18
Cobalt (Co)-Dissolved			<0.000010		mg/L		0.00001	22-AUG-18
Copper (Cu)-Dissolved			<0.00010		mg/L		0.0001	22-AUG-18
Iron (Fe)-Dissolved			<0.0010		mg/L		0.001	22-AUG-18
Lead (Pb)-Dissolved			<0.000010		mg/L		0.00001	22-AUG-18
Lithium (Li)-Dissolved			<0.00050		mg/L		0.0005	22-AUG-18
Magnesium (Mg)-Dissolved			<0.0040		mg/L		0.004	22-AUG-18
Manganese (Mn)-Dissolved			<0.000050		mg/L		0.00005	22-AUG-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	22-AUG-18
Nickel (Ni)-Dissolved			<0.000060		mg/L		0.00006	22-AUG-18
Potassium (K)-Dissolved			<0.020	B	mg/L		0.02	22-AUG-18
Selenium (Se)-Dissolved			<0.000040		mg/L		0.00004	22-AUG-18
Silver (Ag)-Dissolved			<0.0000050		mg/L		0.000005	22-AUG-18
Sodium (Na)-Dissolved			<0.0050		mg/L		0.005	22-AUG-18
Strontium (Sr)-Dissolved			<0.000050		mg/L		0.00005	22-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch R4180522								
WG2855629-1 MB								
Thallium (Tl)-Dissolved			<0.000005(		mg/L		0.000005	22-AUG-18
Tin (Sn)-Dissolved			<0.000050		mg/L		0.00005	22-AUG-18
Titanium (Ti)-Dissolved			<0.00010		mg/L		0.0001	22-AUG-18
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	22-AUG-18
Vanadium (V)-Dissolved			<0.000050		mg/L		0.00005	22-AUG-18
Zinc (Zn)-Dissolved			<0.00080		mg/L		0.0008	22-AUG-18
MET-T-CCMS-ED	**Water**							
Batch R4173929								
WG2851602-3 DUP		**L2131670-19**						
Silicon (Si)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	16-AUG-18
Sulfur (S)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	20	16-AUG-18
Zirconium (Zr)-Total		<0.000060	<0.000060	RPD-NA	mg/L	N/A	20	16-AUG-18
WG2851602-2 LCS								
Silicon (Si)-Total			104.4		%		70-130	16-AUG-18
Sulfur (S)-Total			100.8		%		70-130	16-AUG-18
Zirconium (Zr)-Total			95.6		%		70-130	16-AUG-18
WG2851602-1 MB								
Silicon (Si)-Total			<0.10		mg/L		0.1	16-AUG-18
Sulfur (S)-Total			<0.50		mg/L		0.5	16-AUG-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	16-AUG-18
WG2851602-4 MS		**L2131670-20**						
Silicon (Si)-Total			98.9		%		70-130	16-AUG-18
Sulfur (S)-Total			94.5		%		70-130	16-AUG-18
Zirconium (Zr)-Total			119.6		%		70-130	16-AUG-18
Batch R4184711								
WG2856539-2 LCS								
Silicon (Si)-Total			97.0		%		70-130	26-AUG-18
Sulfur (S)-Total			96.0		%		70-130	26-AUG-18
Zirconium (Zr)-Total			98.2		%		70-130	26-AUG-18
WG2856539-1 MB								
Silicon (Si)-Total			<0.10		mg/L		0.1	26-AUG-18
Sulfur (S)-Total			<0.50		mg/L		0.5	26-AUG-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	26-AUG-18
MET-T-NP-U-CCMS-ED	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4184711								
WG2856539-3 DUP		**L2131670-17**						
Aluminum (Al)-Total		0.0235	0.0224		mg/L	4.8	20	26-AUG-18
Antimony (Sb)-Total		0.000132	0.000134		mg/L	1.2	20	26-AUG-18
Arsenic (As)-Total		0.000241	0.000267		mg/L	10	20	26-AUG-18
Barium (Ba)-Total		0.00904	0.00923		mg/L	2.0	20	26-AUG-18
Beryllium (Be)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	26-AUG-18
Bismuth (Bi)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	26-AUG-18
Boron (B)-Total		0.0012	0.0013		mg/L	4.3	20	26-AUG-18
Cadmium (Cd)-Total		0.0000077	0.0000073		mg/L	5.7	20	26-AUG-18
Chromium (Cr)-Total		0.000096	0.000104		mg/L	8.8	20	26-AUG-18
Cobalt (Co)-Total		0.000202	0.000215		mg/L	6.3	20	26-AUG-18
Copper (Cu)-Total		0.00173	0.00181		mg/L	5.0	20	26-AUG-18
Iron (Fe)-Total		0.0395	0.0396		mg/L	0.3	25	26-AUG-18
Lead (Pb)-Total		0.000022	0.000022		mg/L	1.2	20	26-AUG-18
Lithium (Li)-Total		0.00064	0.00055		mg/L	16	20	26-AUG-18
Manganese (Mn)-Total		0.00447	0.00445		mg/L	0.5	20	26-AUG-18
Molybdenum (Mo)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	26-AUG-18
Nickel (Ni)-Total		0.00395	0.00399		mg/L	1.1	20	26-AUG-18
Selenium (Se)-Total		<0.000040	<0.000040	RPD-NA	mg/L	N/A	20	26-AUG-18
Silver (Ag)-Total		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	26-AUG-18
Strontium (Sr)-Total		0.0185	0.0186		mg/L	0.3	20	26-AUG-18
Thallium (Tl)-Total		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	26-AUG-18
Tin (Sn)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	26-AUG-18
Titanium (Ti)-Total		0.00037	0.00044		mg/L	16	20	26-AUG-18
Uranium (U)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	26-AUG-18
Vanadium (V)-Total		0.000058	0.000068		mg/L	16	20	26-AUG-18
Zinc (Zn)-Total		0.00116	0.00125		mg/L	7.5	20	26-AUG-18
WG2856539-2 LCS								
Aluminum (Al)-Total			104.0		%		80-120	26-AUG-18
Antimony (Sb)-Total			103.3		%		80-120	26-AUG-18
Arsenic (As)-Total			99.1		%		80-120	26-AUG-18
Barium (Ba)-Total			101.1		%		80-120	26-AUG-18
Beryllium (Be)-Total			97.4		%		80-120	26-AUG-18
Bismuth (Bi)-Total			98.9		%		80-120	26-AUG-18
Boron (B)-Total			97.0		%		80-120	26-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4184711								
WG2856539-2 LCS								
Cadmium (Cd)-Total			99.5		%		80-120	26-AUG-18
Chromium (Cr)-Total			102.2		%		80-120	26-AUG-18
Cobalt (Co)-Total			99.1		%		80-120	26-AUG-18
Copper (Cu)-Total			99.2		%		80-120	26-AUG-18
Iron (Fe)-Total			96.1		%		80-120	26-AUG-18
Lead (Pb)-Total			100.4		%		80-120	26-AUG-18
Lithium (Li)-Total			95.2		%		80-120	26-AUG-18
Manganese (Mn)-Total			99.7		%		80-120	26-AUG-18
Molybdenum (Mo)-Total			99.8		%		80-120	26-AUG-18
Nickel (Ni)-Total			98.9		%		80-120	26-AUG-18
Selenium (Se)-Total			94.2		%		80-120	26-AUG-18
Silver (Ag)-Total			106.8		%		80-120	26-AUG-18
Strontium (Sr)-Total			99.5		%		80-120	26-AUG-18
Thallium (Tl)-Total			99.4		%		80-120	26-AUG-18
Tin (Sn)-Total			101.8		%		80-120	26-AUG-18
Titanium (Ti)-Total			98.9		%		80-120	26-AUG-18
Uranium (U)-Total			100.3		%		80-120	26-AUG-18
Vanadium (V)-Total			100.9		%		80-120	26-AUG-18
Zinc (Zn)-Total			96.5		%		80-120	26-AUG-18
WG2856539-1 MB								
Aluminum (Al)-Total			<0.00030		mg/L		0.0003	26-AUG-18
Antimony (Sb)-Total			<0.000020		mg/L		0.00002	26-AUG-18
Arsenic (As)-Total			<0.000020		mg/L		0.00002	26-AUG-18
Barium (Ba)-Total			<0.000050		mg/L		0.00005	26-AUG-18
Beryllium (Be)-Total			<0.000010		mg/L		0.00001	26-AUG-18
Bismuth (Bi)-Total			<0.000010		mg/L		0.00001	26-AUG-18
Boron (B)-Total			<0.0010		mg/L		0.001	26-AUG-18
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	26-AUG-18
Chromium (Cr)-Total			<0.000060		mg/L		0.00006	26-AUG-18
Cobalt (Co)-Total			<0.000010		mg/L		0.00001	26-AUG-18
Copper (Cu)-Total			<0.00010		mg/L		0.0001	26-AUG-18
Iron (Fe)-Total			<0.0010		mg/L		0.001	26-AUG-18
Lead (Pb)-Total			<0.000010		mg/L		0.00001	26-AUG-18
Lithium (Li)-Total			<0.00050		mg/L		0.0005	26-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4184711								
WG2856539-1 MB								
Manganese (Mn)-Total			<0.000050		mg/L		0.00005	26-AUG-18
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	26-AUG-18
Nickel (Ni)-Total			<0.000060		mg/L		0.00006	26-AUG-18
Selenium (Se)-Total			<0.000040		mg/L		0.00004	26-AUG-18
Silver (Ag)-Total			<0.000005(		mg/L		0.000005	26-AUG-18
Strontium (Sr)-Total			<0.000050		mg/L		0.00005	26-AUG-18
Thallium (Tl)-Total			<0.000005(		mg/L		0.000005	26-AUG-18
Tin (Sn)-Total			<0.000050		mg/L		0.00005	26-AUG-18
Titanium (Ti)-Total			<0.00010		mg/L		0.0001	26-AUG-18
Uranium (U)-Total			<0.000010		mg/L		0.00001	26-AUG-18
Vanadium (V)-Total			<0.000050		mg/L		0.00005	26-AUG-18
Zinc (Zn)-Total			<0.00080		mg/L		0.0008	26-AUG-18
WG2856539-4 MS		**L2131670-18**						
Aluminum (Al)-Total			101.6		%		70-130	26-AUG-18
Antimony (Sb)-Total			108.4		%		70-130	26-AUG-18
Arsenic (As)-Total			98.6		%		70-130	26-AUG-18
Barium (Ba)-Total			101.9		%		70-130	26-AUG-18
Beryllium (Be)-Total			99.9		%		70-130	26-AUG-18
Bismuth (Bi)-Total			84.8		%		70-130	26-AUG-18
Boron (B)-Total			99.6		%		70-130	26-AUG-18
Cadmium (Cd)-Total			104.9		%		70-130	26-AUG-18
Chromium (Cr)-Total			99.9		%		70-130	26-AUG-18
Cobalt (Co)-Total			98.3		%		70-130	26-AUG-18
Copper (Cu)-Total			99.6		%		70-130	26-AUG-18
Iron (Fe)-Total			99.2		%		70-130	26-AUG-18
Lead (Pb)-Total			97.7		%		70-130	26-AUG-18
Lithium (Li)-Total			97.8		%		70-130	26-AUG-18
Manganese (Mn)-Total			97.4		%		70-130	26-AUG-18
Molybdenum (Mo)-Total			100.2		%		70-130	26-AUG-18
Nickel (Ni)-Total			97.8		%		70-130	26-AUG-18
Selenium (Se)-Total			101.4		%		70-130	26-AUG-18
Silver (Ag)-Total			117.3		%		70-130	26-AUG-18
Strontium (Sr)-Total			N/A	MS-B	%		-	26-AUG-18
Thallium (Tl)-Total			99.7		%		70-130	26-AUG-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4184711								
WG2856539-4 MS		**L2131670-18**						
Tin (Sn)-Total			101.0		%		70-130	26-AUG-18
Titanium (Ti)-Total			100.3		%		70-130	26-AUG-18
Uranium (U)-Total			100.1		%		70-130	26-AUG-18
Vanadium (V)-Total			98.1		%		70-130	26-AUG-18
Zinc (Zn)-Total			98.4		%		70-130	26-AUG-18
NH3-L-CFA-ED	**Water**							
Batch R4155554								
WG2839921-3 DUP		**L2131670-10**						
Ammonia, Total (as N)		<0.0050	0.0085	RPD-NA	mg/L	N/A	20	02-AUG-18
WG2839921-7 DUP		**L2131670-20**						
Ammonia, Total (as N)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	02-AUG-18
WG2839921-10 LCS								
Ammonia, Total (as N)			93.4		%		85-115	02-AUG-18
WG2839921-2 LCS								
Ammonia, Total (as N)			96.1		%		85-115	02-AUG-18
WG2839921-6 LCS								
Ammonia, Total (as N)			93.6		%		85-115	02-AUG-18
WG2839921-1 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	02-AUG-18
WG2839921-5 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	02-AUG-18
WG2839921-9 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	02-AUG-18
WG2839921-4 MS		**L2131670-10**						
Ammonia, Total (as N)			105.6		%		75-125	02-AUG-18
WG2839921-8 MS		**L2131670-20**						
Ammonia, Total (as N)			114.4		%		75-125	02-AUG-18
Batch R4161373								
WG2844128-3 DUP		**L2131670-19**						
Ammonia, Total (as N)		0.0101	0.0101		mg/L	0.0	20	08-AUG-18
WG2844128-10 LCS								
Ammonia, Total (as N)			93.2		%		85-115	08-AUG-18
WG2844128-2 LCS								
Ammonia, Total (as N)			96.9		%		85-115	08-AUG-18
WG2844128-6 LCS								
Ammonia, Total (as N)			94.2		%		85-115	08-AUG-18
WG2844128-1 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-L-CFA-ED	**Water**							
Batch R4161373								
WG2844128-1 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	08-AUG-18
WG2844128-5 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	08-AUG-18
WG2844128-9 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	08-AUG-18
WG2844128-4 MS		**L2131670-19**						
Ammonia, Total (as N)			114.0		%		75-125	08-AUG-18
Batch R4194571								
WG2864356-5 LCS								
Ammonia, Total (as N)			99.8		%		85-115	30-AUG-18
WG2864356-6 LCS								
Ammonia, Total (as N)			101.2		%		85-115	30-AUG-18
WG2864356-7 LCS								
Ammonia, Total (as N)			103.0		%		85-115	30-AUG-18
WG2864356-8 LCS								
Ammonia, Total (as N)			107.8		%		85-115	30-AUG-18
WG2864356-1 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	30-AUG-18
WG2864356-2 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	30-AUG-18
WG2864356-3 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	30-AUG-18
WG2864356-4 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	30-AUG-18
NO2-L-IC-N-ED	**Water**							
Batch R4138366								
WG2828484-3 DUP		**L2131670-20**						
Nitrite (as N)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	20-JUL-18
WG2828484-11 LCS								
Nitrite (as N)			103.3		%		90-110	20-JUL-18
WG2828484-13 LCS								
Nitrite (as N)			103.0		%		90-110	20-JUL-18
WG2828484-15 LCS								
Nitrite (as N)			103.4		%		90-110	21-JUL-18
WG2828484-2 LCS								
Nitrite (as N)			99.0		%		90-110	20-JUL-18
WG2828484-1 MB								

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-L-IC-N-ED	**Water**							
Batch R4138366								
WG2828484-1 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	20-JUL-18
WG2828484-12 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	20-JUL-18
WG2828484-14 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	20-JUL-18
WG2828484-16 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	21-JUL-18
WG2828484-4 MS		**L2131670-20**						
Nitrite (as N)			105.1		%		75-125	20-JUL-18
NO3-L-IC-N-ED	**Water**							
Batch R4138366								
WG2828484-3 DUP		**L2131670-20**						
Nitrate (as N)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	20-JUL-18
WG2828484-11 LCS								
Nitrate (as N)			100.2		%		90-110	20-JUL-18
WG2828484-13 LCS								
Nitrate (as N)			99.8		%		90-110	20-JUL-18
WG2828484-15 LCS								
Nitrate (as N)			99.8		%		90-110	21-JUL-18
WG2828484-2 LCS								
Nitrate (as N)			100.6		%		90-110	20-JUL-18
WG2828484-1 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	20-JUL-18
WG2828484-12 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	20-JUL-18
WG2828484-14 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	20-JUL-18
WG2828484-16 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	21-JUL-18
WG2828484-4 MS		**L2131670-20**						
Nitrate (as N)			101.3		%		75-125	20-JUL-18
P-T-L-COL-ED	**Water**							
Batch R4173027								
WG2850932-7 DUP		**L2131670-20**						
Phosphorus (P)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	16-AUG-18
WG2850932-10 LCS								
Phosphorus (P)-Total			97.0		%		80-120	16-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-L-COL-ED	**Water**							
Batch R4173027								
WG2850932-12 LCS								
Phosphorus (P)-Total			98.4		%		80-120	16-AUG-18
WG2850932-2 LCS								
Phosphorus (P)-Total			101.8		%		80-120	16-AUG-18
WG2850932-1 MB								
Phosphorus (P)-Total			<0.0010		mg/L		0.001	16-AUG-18
WG2850932-11 MB								
Phosphorus (P)-Total			<0.0010		mg/L		0.001	16-AUG-18
WG2850932-9 MB								
Phosphorus (P)-Total			<0.0010		mg/L		0.001	16-AUG-18
WG2850932-8 MS		**L2131670-20**						
Phosphorus (P)-Total			102.8		%		70-130	16-AUG-18
Batch R4175464								
WG2851885-2 LCS								
Phosphorus (P)-Total			97.6		%		80-120	17-AUG-18
WG2851885-1 MB								
Phosphorus (P)-Total			<0.0010		mg/L		0.001	17-AUG-18
P-TD-L-COL-ED	**Water**							
Batch R4173027								
WG2850932-7 DUP		**L2131670-20**						
Phosphorus (P)-Total	Dissolved	<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	16-AUG-18
WG2850932-10 LCS								
Phosphorus (P)-Total	Dissolved		98.4		%		80-120	16-AUG-18
WG2850932-12 LCS								
Phosphorus (P)-Total	Dissolved		101.0		%		80-120	16-AUG-18
WG2850932-2 LCS								
Phosphorus (P)-Total	Dissolved		101.0		%		80-120	16-AUG-18
WG2850932-1 MB								
Phosphorus (P)-Total	Dissolved		<0.0010		mg/L		0.001	16-AUG-18
WG2850932-11 MB								
Phosphorus (P)-Total	Dissolved		<0.0010		mg/L		0.001	16-AUG-18
WG2850932-9 MB								
Phosphorus (P)-Total	Dissolved		<0.0010		mg/L		0.001	16-AUG-18
WG2850932-8 MS		**L2131670-20**						
Phosphorus (P)-Total	Dissolved		108.1		%		70-130	16-AUG-18
PH/EC/ALK-ED	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R4148632								
WG2836566-8 DUP		**L2131670-19**						
pH		5.29	5.12	J	pH	0.17	0.3	30-JUL-18
Conductivity (EC)		<2.0	<2.0	RPD-NA	uS/cm	N/A	10	30-JUL-18
Bicarbonate (HCO3)		<5.0	<5.0	RPD-NA	mg/L	N/A	25	30-JUL-18
Carbonate (CO3)		<5.0	<5.0	RPD-NA	mg/L	N/A	25	30-JUL-18
Hydroxide (OH)		<5.0	<5.0	RPD-NA	mg/L	N/A	25	30-JUL-18
Alkalinity, Total (as CaCO3)		<2.0	<2.0	RPD-NA	mg/L	N/A	20	30-JUL-18
WG2836566-13 LCS		**MID_1412**						
Conductivity (EC)			95.5		%		90-110	30-JUL-18
WG2836566-14 LCS		**ED-PH6**						
pH			6.02		pH		5.8-6.2	30-JUL-18
WG2836566-15 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			95.9		%		85-115	30-JUL-18
WG2836566-16 LCS		**HI_12890**						
Conductivity (EC)			91.3		%		90-110	30-JUL-18
WG2836566-18 LCS		**MID_1412**						
Conductivity (EC)			96.9		%		90-110	30-JUL-18
WG2836566-19 LCS		**ED-PH6**						
pH			6.02		pH		5.8-6.2	30-JUL-18
WG2836566-2 LCS		**MID_1412**						
Conductivity (EC)			92.2		%		90-110	30-JUL-18
WG2836566-20 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			97.3		%		85-115	30-JUL-18
WG2836566-21 LCS		**HI_12890**						
Conductivity (EC)			92.7		%		90-110	30-JUL-18
WG2836566-23 LCS		**MID_1412**						
Conductivity (EC)			97.5		%		90-110	30-JUL-18
WG2836566-24 LCS		**ED-PH6**						
pH			6.02		pH		5.8-6.2	30-JUL-18
WG2836566-25 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			97.6		%		85-115	30-JUL-18
WG2836566-26 LCS		**HI_12890**						
Conductivity (EC)			93.3		%		90-110	30-JUL-18
WG2836566-28 LCS		**MID_1412**						
Conductivity (EC)			96.5		%		90-110	30-JUL-18
WG2836566-29 LCS		**ED-PH6**						
pH			6.01		pH		5.8-6.2	30-JUL-18
WG2836566-3 LCS		**ED-PH6**						

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R4148632								
WG2836566-3 LCS		**ED-PH6**						
pH			6.04		pH		5.8-6.2	30-JUL-18
WG2836566-30 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			97.5		%		85-115	30-JUL-18
WG2836566-31 LCS		**HI_12890**						
Conductivity (EC)			91.8		%		90-110	30-JUL-18
WG2836566-33 LCS		**MID_1412**						
Conductivity (EC)			93.7		%		90-110	30-JUL-18
WG2836566-34 LCS		**ED-PH6**						
pH			6.02		pH		5.8-6.2	30-JUL-18
WG2836566-35 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			96.1		%		85-115	30-JUL-18
WG2836566-36 LCS		**HI_12890**						
Conductivity (EC)			90.5		%		90-110	30-JUL-18
WG2836566-38 LCS		**MID_1412**						
Conductivity (EC)			95.4		%		90-110	30-JUL-18
WG2836566-39 LCS		**ED-PH6**						
pH			6.02		pH		5.8-6.2	30-JUL-18
WG2836566-4 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			94.9		%		85-115	30-JUL-18
WG2836566-40 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			95.9		%		85-115	30-JUL-18
WG2836566-41 LCS		**HI_12890**						
Conductivity (EC)			90.8		%		90-110	30-JUL-18
WG2836566-5 LCS		**HI_12890**						
Conductivity (EC)			90.5		%		90-110	30-JUL-18
WG2836566-1 MB								
Conductivity (EC)			<2.0		uS/cm		2	30-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	30-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	30-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	30-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	30-JUL-18
WG2836566-12 MB								
Conductivity (EC)			<2.0		uS/cm		2	30-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	30-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	30-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	30-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	30-JUL-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R4148632								
WG2836566-17 MB								
Conductivity (EC)			<2.0		uS/cm		2	30-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	30-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	30-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	30-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	30-JUL-18
WG2836566-22 MB								
Conductivity (EC)			<2.0		uS/cm		2	30-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	30-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	30-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	30-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	30-JUL-18
WG2836566-27 MB								
Conductivity (EC)			<2.0		uS/cm		2	30-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	30-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	30-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	30-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	30-JUL-18
WG2836566-32 MB								
Conductivity (EC)			<2.0		uS/cm		2	30-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	30-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	30-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	30-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	30-JUL-18
WG2836566-37 MB								
Conductivity (EC)			<2.0		uS/cm		2	30-JUL-18
Bicarbonate (HCO3)			<5.0		mg/L		5	30-JUL-18
Carbonate (CO3)			<5.0		mg/L		5	30-JUL-18
Hydroxide (OH)			<5.0		mg/L		5	30-JUL-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	30-JUL-18
PO4-DO-L-COL-ED	**Water**							
Batch R4135572								
WG2827953-28 DUP		**L2131670-20**						
Orthophosphate-Dissolved (as P)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	21-JUL-18
WG2827953-10 LCS								
Orthophosphate-Dissolved (as P)			92.8		%		80-120	21-JUL-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PO4-DO-L-COL-ED	**Water**							
Batch R4135572								
WG2827953-11 LCS								
Orthophosphate-Dissolved (as P)			94.6		%		80-120	21-JUL-18
WG2827953-12 LCS								
Orthophosphate-Dissolved (as P)			94.6		%		80-120	21-JUL-18
WG2827953-27 LCS								
Orthophosphate-Dissolved (as P)			96.6		%		80-120	21-JUL-18
WG2827953-7 LCS								
Orthophosphate-Dissolved (as P)			96.2		%		80-120	21-JUL-18
WG2827953-8 LCS								
Orthophosphate-Dissolved (as P)			96.0		%		80-120	21-JUL-18
WG2827953-9 LCS								
Orthophosphate-Dissolved (as P)			100.0		%		80-120	21-JUL-18
WG2827953-1 MB								
Orthophosphate-Dissolved (as P)			<0.0010		mg/L		0.001	21-JUL-18
WG2827953-2 MB								
Orthophosphate-Dissolved (as P)			<0.0010		mg/L		0.001	21-JUL-18
WG2827953-26 MB								
Orthophosphate-Dissolved (as P)			<0.0010		mg/L		0.001	21-JUL-18
WG2827953-3 MB								
Orthophosphate-Dissolved (as P)			<0.0010		mg/L		0.001	21-JUL-18
WG2827953-4 MB								
Orthophosphate-Dissolved (as P)			<0.0010		mg/L		0.001	21-JUL-18
WG2827953-5 MB								
Orthophosphate-Dissolved (as P)			<0.0010		mg/L		0.001	21-JUL-18
WG2827953-6 MB								
Orthophosphate-Dissolved (as P)			<0.0010		mg/L		0.001	21-JUL-18
WG2827953-29 MS		**L2131670-20**						
Orthophosphate-Dissolved (as P)			100.8		%		70-130	21-JUL-18
SILICATE-L-COL-ED	**Water**							
Batch R4146086								
WG2835776-11 DUP		**L2131670-20**						
Silicate (as SiO2)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	29-JUL-18
WG2835776-9 DUP		**L2131670-19**						
Silicate (as SiO2)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	29-JUL-18
WG2835776-2 LCS								
Silicate (as SiO2)			107.2		%		85-115	29-JUL-18
WG2835776-4 LCS								
Silicate (as SiO2)			104.4		%		85-115	29-JUL-18
WG2835776-6 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SILICATE-L-COL-ED	**Water**							
Batch R4146086								
WG2835776-6 LCS								
Silicate (as SiO2)			109.2		%		85-115	29-JUL-18
WG2835776-1 MB								
Silicate (as SiO2)			<0.010		mg/L		0.01	29-JUL-18
WG2835776-3 MB								
Silicate (as SiO2)			<0.010		mg/L		0.01	29-JUL-18
WG2835776-5 MB								
Silicate (as SiO2)			<0.010		mg/L		0.01	29-JUL-18
WG2835776-10 MS		**L2131670-19**						
Silicate (as SiO2)			92.9		%		80-120	29-JUL-18
WG2835776-12 MS		**L2131670-20**						
Silicate (as SiO2)			102.0		%		80-120	29-JUL-18
SO4-L-IC-N-ED	**Water**							
Batch R4138366								
WG2828484-3 DUP		**L2131670-20**						
Sulfate (SO4)		<0.050	<0.050	RPD-NA	mg/L	N/A	20	20-JUL-18
WG2828484-11 LCS								
Sulfate (SO4)			101.5		%		90-110	20-JUL-18
WG2828484-13 LCS								
Sulfate (SO4)			101.4		%		90-110	20-JUL-18
WG2828484-15 LCS								
Sulfate (SO4)			101.3		%		90-110	21-JUL-18
WG2828484-2 LCS								
Sulfate (SO4)			105.0		%		90-110	20-JUL-18
WG2828484-1 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	20-JUL-18
WG2828484-12 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	20-JUL-18
WG2828484-14 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	20-JUL-18
WG2828484-16 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	21-JUL-18
WG2828484-4 MS		**L2131670-20**						
Sulfate (SO4)			102.3		%		75-125	20-JUL-18
SOLIDS-TDS-ED	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TDS-ED	**Water**							
Batch R4139509								
WG2829220-3 DUP		**L2131670-15**						
Total Dissolved Solids		49	43		mg/L	13	20	22-JUL-18
WG2829220-2 LCS								
Total Dissolved Solids			99.5		%		85-115	22-JUL-18
WG2829220-1 MB								
Total Dissolved Solids			<10		mg/L		10	22-JUL-18
Batch R4142827								
WG2831360-3 DUP		**L2131670-20**						
Total Dissolved Solids		<10	<10	RPD-NA	mg/L	N/A	20	24-JUL-18
WG2831360-2 LCS								
Total Dissolved Solids			94.6		%		85-115	24-JUL-18
WG2831360-1 MB								
Total Dissolved Solids			<10		mg/L		10	24-JUL-18
SOLIDS-TOTSUS-ED	**Water**							
Batch R4135780								
WG2828945-3 DUP		**L2131670-15**						
Total Suspended Solids		<3.0	<3.0	RPD-NA	mg/L	N/A	20	21-JUL-18
WG2828945-2 LCS								
Total Suspended Solids			105.8		%		85-115	21-JUL-18
WG2828945-1 MB								
Total Suspended Solids			<3.0		mg/L		3	21-JUL-18
Batch R4135893								
WG2829180-2 LCS								
Total Suspended Solids			103.6		%		85-115	21-JUL-18
WG2829180-1 MB								
Total Suspended Solids			<3.0		mg/L		3	21-JUL-18
Batch R4139907								
WG2831195-4 DUP		**L2131670-20**						
Total Suspended Solids		<3.0	<3.0	RPD-NA	mg/L	N/A	20	24-JUL-18
WG2831195-2 LCS								
Total Suspended Solids			109.8		%		85-115	24-JUL-18
WG2831195-1 MB								
Total Suspended Solids			<3.0		mg/L		3	24-JUL-18
SULPHIDE-CFA-ED	**Water**							
Batch R4136631								
WG2829132-11 DUP		**L2131670-20**						
Sulphide (as S)		<0.0015	<0.0015	RPD-NA	mg/L	N/A	20	21-JUL-18
WG2829132-10 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SULPHIDE-CFA-ED	**Water**							
Batch R4136631								
WG2829132-10 LCS								
Sulphide (as S)			90.5		%		75-125	21-JUL-18
WG2829132-14 LCS								
Sulphide (as S)			97.3		%		75-125	21-JUL-18
WG2829132-2 LCS								
Sulphide (as S)			103.6		%		75-125	21-JUL-18
WG2829132-6 LCS								
Sulphide (as S)			96.9		%		75-125	21-JUL-18
WG2829132-1 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	21-JUL-18
WG2829132-13 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	21-JUL-18
WG2829132-5 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	21-JUL-18
WG2829132-9 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	21-JUL-18
WG2829132-12 MS		**L2131670-20**						
Sulphide (as S)			104.6		%		65-135	21-JUL-18
Batch R4139003								
WG2830687-19 DUP		**L2131670-19**						
Sulphide (as S)		<0.0015	<0.0015	RPD-NA	mg/L	N/A	20	23-JUL-18
WG2830687-10 LCS								
Sulphide (as S)			96.1		%		75-125	23-JUL-18
WG2830687-22 LCS								
Sulphide (as S)			96.1		%		75-125	23-JUL-18
WG2830687-26 LCS								
Sulphide (as S)			87.3		%		75-125	23-JUL-18
WG2830687-30 LCS								
Sulphide (as S)			81.7		%		75-125	23-JUL-18
WG2830687-6 LCS								
Sulphide (as S)			76.0		%		75-125	23-JUL-18
WG2830687-7 LCS								
Sulphide (as S)			94.1		%		75-125	23-JUL-18
WG2830687-8 LCS								
Sulphide (as S)			90.0		%		75-125	23-JUL-18
WG2830687-9 LCS								
Sulphide (as S)			94.5		%		75-125	23-JUL-18
WG2830687-1 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	23-JUL-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SULPHIDE-CFA-ED	**Water**							
Batch R4139003								
WG2830687-2 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	23-JUL-18
WG2830687-21 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	23-JUL-18
WG2830687-25 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	23-JUL-18
WG2830687-29 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	23-JUL-18
WG2830687-3 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	23-JUL-18
WG2830687-4 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	23-JUL-18
WG2830687-5 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	23-JUL-18
WG2830687-20 MS		**L2131670-19**						
Sulphide (as S)			93.6		%		65-135	23-JUL-18
TKN-L-CFA-ED	**Water**							
Batch R4173328								
WG2850635-2 LCS								
Total Kjeldahl Nitrogen			97		%		75-125	16-AUG-18
WG2850635-1 MB								
Total Kjeldahl Nitrogen			<0.050		mg/L		0.05	16-AUG-18
WG2850635-4 MS		**L2131670-10**						
Total Kjeldahl Nitrogen			88		%		70-130	16-AUG-18
Batch R4180486								
WG2855864-2 LCS								
Total Kjeldahl Nitrogen			102		%		75-125	22-AUG-18
WG2855864-1 MB								
Total Kjeldahl Nitrogen			<0.050		mg/L		0.05	22-AUG-18
TURBIDITY-ED	**Water**							
Batch R4134247								
WG2828391-3 DUP		**L2131670-14**						
Turbidity		0.48	0.46		NTU	6.0	15	20-JUL-18
WG2828391-2 LCS								
Turbidity			100.7		%		95-105	20-JUL-18
WG2828391-1 MB								
Turbidity			<0.10		NTU		0.1	20-JUL-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
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
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							
Color, True							
	1	15-JUL-18 11:30	21-JUL-18 20:27	3	6	days	EHTR
	2	15-JUL-18 10:30	21-JUL-18 20:27	3	6	days	EHTR
	3	15-JUL-18 00:45	21-JUL-18 20:27	3	7	days	EHTR
	4	15-JUL-18 13:45	21-JUL-18 20:27	3	6	days	EHTR
	5	15-JUL-18 14:45	21-JUL-18 20:27	3	6	days	EHTR
	6	15-JUL-18 15:45	21-JUL-18 20:27	3	6	days	EHTR
	7	14-JUL-18 10:30	21-JUL-18 20:27	3	7	days	EHTR
	8	14-JUL-18 11:00	21-JUL-18 20:27	3	7	days	EHTR
	9	14-JUL-18 13:00	21-JUL-18 20:27	3	7	days	EHTR
	10	14-JUL-18 14:30	21-JUL-18 20:27	3	7	days	EHTR
	11	14-JUL-18 15:00	21-JUL-18 20:27	3	7	days	EHTR
	12	14-JUL-18 16:00	21-JUL-18 20:27	3	7	days	EHTR
	13	16-JUL-18 10:30	21-JUL-18 20:27	3	5	days	EHTL
	14	16-JUL-18 12:00	21-JUL-18 20:27	3	5	days	EHTL
	15	13-JUL-18 16:00	21-JUL-18 20:27	3	8	days	EHTR
	16	16-JUL-18 13:00	21-JUL-18 20:27	3	5	days	EHTL
	17	13-JUL-18 11:30	21-JUL-18 20:27	3	8	days	EHTR
	18	13-JUL-18 13:30	21-JUL-18 20:27	3	8	days	EHTR
	20	17-JUL-18 10:00	21-JUL-18 20:27	3	4	days	EHT
Total Dissolved Solids							
	7	14-JUL-18 10:30	22-JUL-18 00:00	7	8	days	EHT
	8	14-JUL-18 11:00	22-JUL-18 00:00	7	8	days	EHT
	15	13-JUL-18 16:00	22-JUL-18 00:00	7	8	days	EHT
	17	13-JUL-18 11:30	22-JUL-18 00:00	7	9	days	EHT
	18	13-JUL-18 13:30	22-JUL-18 00:00	7	8	days	EHT
Total Suspended Solids							
	17	13-JUL-18 11:30	21-JUL-18 00:00	7	8	days	EHT
Turbidity							
	1	15-JUL-18 11:30	20-JUL-18 14:00	3	5	days	EHTR
	2	15-JUL-18 10:30	20-JUL-18 14:00	3	5	days	EHTR
	3	15-JUL-18 00:45	20-JUL-18 14:00	3	6	days	EHTR
	4	15-JUL-18 13:45	20-JUL-18 14:00	3	5	days	EHTR
	5	15-JUL-18 14:45	20-JUL-18 14:00	3	5	days	EHTR
	6	15-JUL-18 15:45	20-JUL-18 14:00	3	5	days	EHTR
	7	14-JUL-18 10:30	20-JUL-18 14:00	3	6	days	EHTR
	8	14-JUL-18 11:00	20-JUL-18 14:00	3	6	days	EHTR
	9	14-JUL-18 13:00	20-JUL-18 14:00	3	6	days	EHTR
	10	14-JUL-18 14:30	20-JUL-18 14:00	3	6	days	EHTR
	11	14-JUL-18 15:00	20-JUL-18 14:00	3	6	days	EHTR
	12	14-JUL-18 16:00	20-JUL-18 14:00	3	6	days	EHTR
	13	16-JUL-18 10:30	20-JUL-18 14:00	3	4	days	EHTL
	14	16-JUL-18 12:00	20-JUL-18 14:00	3	4	days	EHTL
	15	13-JUL-18 16:00	20-JUL-18 14:00	3	7	days	EHTR
	16	16-JUL-18 13:00	20-JUL-18 14:00	3	4	days	EHTL
	17	13-JUL-18 11:30	20-JUL-18 14:00	3	7	days	EHTR
	18	13-JUL-18 13:30	20-JUL-18 14:00	3	7	days	EHTR
Leachable Anions & Nutrients							
Diss. Orthophosphate in Water by Colour							
	1	15-JUL-18 11:30	21-JUL-18 00:00	3	6	days	EHTR
	2	15-JUL-18 10:30	21-JUL-18 00:00	3	6	days	EHTR
	3	15-JUL-18 00:45	21-JUL-18 00:00	3	6	days	EHTR
	4	15-JUL-18 13:45	21-JUL-18 00:00	3	5	days	EHTR
	5	15-JUL-18 14:45	21-JUL-18 00:00	3	5	days	EHTR
	6	15-JUL-18 15:45	21-JUL-18 00:00	3	5	days	EHTR
	7	14-JUL-18 10:30	21-JUL-18 00:00	3	7	days	EHTR
	8	14-JUL-18 11:00	21-JUL-18 00:00	3	7	days	EHTR

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Leachable Anions & Nutrients							
Diss. Orthophosphate in Water by Colour							
	9	14-JUL-18 13:00	21-JUL-18 00:00	3	6	days	EHTR
	10	14-JUL-18 14:30	21-JUL-18 00:00	3	6	days	EHTR
	11	14-JUL-18 15:00	21-JUL-18 00:00	3	6	days	EHTR
	12	14-JUL-18 16:00	21-JUL-18 00:00	3	6	days	EHTR
	13	16-JUL-18 10:30	21-JUL-18 00:00	3	5	days	EHTL
	14	16-JUL-18 12:00	21-JUL-18 00:00	3	5	days	EHTL
	15	13-JUL-18 16:00	21-JUL-18 00:00	3	7	days	EHTR
	16	16-JUL-18 13:00	21-JUL-18 00:00	3	4	days	EHTL
	17	13-JUL-18 11:30	21-JUL-18 00:00	3	8	days	EHTR
	18	13-JUL-18 13:30	21-JUL-18 00:00	3	7	days	EHTR
	20	17-JUL-18 10:00	21-JUL-18 00:00	3	4	days	EHT
Anions and Nutrients							
Ammonia in Water by Colour							
	6	15-JUL-18 15:45	30-AUG-18 00:00	28	45	days	EHT
Nitrate in Water by IC (Low Level)							
	1	15-JUL-18 11:30	20-JUL-18 08:00	3	5	days	EHTR
	2	15-JUL-18 10:30	20-JUL-18 08:00	3	5	days	EHTR
	3	15-JUL-18 00:45	20-JUL-18 08:00	3	5	days	EHTR
	4	15-JUL-18 13:45	20-JUL-18 08:00	3	5	days	EHTR
	5	15-JUL-18 14:45	20-JUL-18 08:00	3	5	days	EHTR
	6	15-JUL-18 15:45	20-JUL-18 08:00	3	5	days	EHTR
	7	14-JUL-18 10:30	20-JUL-18 08:00	3	6	days	EHTR
	8	14-JUL-18 11:00	20-JUL-18 08:00	3	6	days	EHTR
	9	14-JUL-18 13:00	20-JUL-18 08:00	3	6	days	EHTR
	10	14-JUL-18 14:30	20-JUL-18 08:00	3	6	days	EHTR
	11	14-JUL-18 15:00	20-JUL-18 08:00	3	6	days	EHTR
	12	14-JUL-18 16:00	20-JUL-18 08:00	3	6	days	EHTR
	13	16-JUL-18 10:30	20-JUL-18 08:00	3	4	days	EHTL
	14	16-JUL-18 12:00	20-JUL-18 08:00	3	4	days	EHTL
	15	13-JUL-18 16:00	20-JUL-18 08:00	3	7	days	EHTR
	16	16-JUL-18 13:00	20-JUL-18 08:00	3	4	days	EHTL
	17	13-JUL-18 11:30	20-JUL-18 08:00	3	7	days	EHTR
	18	13-JUL-18 13:30	20-JUL-18 08:00	3	7	days	EHTR
Nitrite in Water by IC (Low Level)							
	1	15-JUL-18 11:30	20-JUL-18 08:00	3	5	days	EHTR
	2	15-JUL-18 10:30	20-JUL-18 08:00	3	5	days	EHTR
	3	15-JUL-18 00:45	20-JUL-18 08:00	3	5	days	EHTR
	4	15-JUL-18 13:45	20-JUL-18 08:00	3	5	days	EHTR
	5	15-JUL-18 14:45	20-JUL-18 08:00	3	5	days	EHTR
	6	15-JUL-18 15:45	20-JUL-18 08:00	3	5	days	EHTR
	7	14-JUL-18 10:30	20-JUL-18 08:00	3	6	days	EHTR
	8	14-JUL-18 11:00	20-JUL-18 08:00	3	6	days	EHTR
	9	14-JUL-18 13:00	20-JUL-18 08:00	3	6	days	EHTR
	10	14-JUL-18 14:30	20-JUL-18 08:00	3	6	days	EHTR
	11	14-JUL-18 15:00	20-JUL-18 08:00	3	6	days	EHTR
	12	14-JUL-18 16:00	20-JUL-18 08:00	3	6	days	EHTR
	13	16-JUL-18 10:30	20-JUL-18 08:00	3	4	days	EHTL
	14	16-JUL-18 12:00	20-JUL-18 08:00	3	4	days	EHTL
	15	13-JUL-18 16:00	20-JUL-18 08:00	3	7	days	EHTR
	16	16-JUL-18 13:00	20-JUL-18 08:00	3	4	days	EHTL
	17	13-JUL-18 11:30	20-JUL-18 08:00	3	7	days	EHTR
	18	13-JUL-18 13:30	20-JUL-18 08:00	3	7	days	EHTR
Sulphide							
	17	13-JUL-18 11:30	21-JUL-18 00:00	7	8	days	EHT
TKN in Water by Colour							

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Anions and Nutrients							
TKN in Water by Colour							
	1	15-JUL-18 11:30	15-AUG-18 00:00	28	31	days	EHT
	2	15-JUL-18 10:30	15-AUG-18 00:00	28	31	days	EHT
	3	15-JUL-18 00:45	15-AUG-18 00:00	28	31	days	EHT
	4	15-JUL-18 13:45	15-AUG-18 00:00	28	30	days	EHT
	5	15-JUL-18 14:45	15-AUG-18 00:00	28	30	days	EHT
	6	15-JUL-18 15:45	15-AUG-18 00:00	28	30	days	EHT
	7	14-JUL-18 10:30	15-AUG-18 00:00	28	32	days	EHT
	8	14-JUL-18 11:00	15-AUG-18 00:00	28	32	days	EHT
	9	14-JUL-18 13:00	15-AUG-18 00:00	28	31	days	EHT
	10	14-JUL-18 14:30	15-AUG-18 00:00	28	31	days	EHT
	11	14-JUL-18 15:00	15-AUG-18 00:00	28	31	days	EHT
	12	14-JUL-18 16:00	15-AUG-18 00:00	28	31	days	EHT
	13	16-JUL-18 10:30	15-AUG-18 00:00	28	30	days	EHT
	14	16-JUL-18 12:00	15-AUG-18 00:00	28	30	days	EHT
	15	13-JUL-18 16:00	15-AUG-18 00:00	28	32	days	EHT
	16	16-JUL-18 13:00	15-AUG-18 00:00	28	29	days	EHT
	17	13-JUL-18 11:30	15-AUG-18 00:00	28	33	days	EHT
	18	13-JUL-18 13:30	15-AUG-18 00:00	28	32	days	EHT
	20	17-JUL-18 10:00	15-AUG-18 00:00	28	29	days	EHT
Total Dissolved P in Water by Colour							
	1	15-JUL-18 11:30	16-AUG-18 00:00	28	32	days	EHT
	2	15-JUL-18 10:30	16-AUG-18 00:00	28	32	days	EHT
	3	15-JUL-18 00:45	16-AUG-18 00:00	28	32	days	EHT
	4	15-JUL-18 13:45	16-AUG-18 00:00	28	31	days	EHT
	5	15-JUL-18 14:45	16-AUG-18 00:00	28	31	days	EHT
	6	15-JUL-18 15:45	16-AUG-18 00:00	28	31	days	EHT
	7	14-JUL-18 10:30	16-AUG-18 00:00	28	33	days	EHT
	8	14-JUL-18 11:00	16-AUG-18 00:00	28	33	days	EHT
	9	14-JUL-18 13:00	16-AUG-18 00:00	28	32	days	EHT
	10	14-JUL-18 14:30	16-AUG-18 00:00	28	32	days	EHT
	11	14-JUL-18 15:00	16-AUG-18 00:00	28	32	days	EHT
	12	14-JUL-18 16:00	16-AUG-18 00:00	28	32	days	EHT
	13	16-JUL-18 10:30	16-AUG-18 00:00	28	31	days	EHT
	14	16-JUL-18 12:00	16-AUG-18 00:00	28	31	days	EHT
	15	13-JUL-18 16:00	16-AUG-18 00:00	28	33	days	EHT
	16	16-JUL-18 13:00	16-AUG-18 00:00	28	30	days	EHT
	17	13-JUL-18 11:30	16-AUG-18 00:00	28	34	days	EHT
	18	13-JUL-18 13:30	16-AUG-18 00:00	28	33	days	EHT
	20	17-JUL-18 10:00	16-AUG-18 00:00	28	30	days	EHT
Total P in Water by Colour							
	1	15-JUL-18 11:30	16-AUG-18 00:00	28	32	days	EHT
	2	15-JUL-18 10:30	16-AUG-18 00:00	28	32	days	EHT
	3	15-JUL-18 00:45	16-AUG-18 00:00	28	32	days	EHT
	4	15-JUL-18 13:45	16-AUG-18 00:00	28	31	days	EHT
	5	15-JUL-18 14:45	16-AUG-18 00:00	28	31	days	EHT
	6	15-JUL-18 15:45	16-AUG-18 00:00	28	31	days	EHT
	7	14-JUL-18 10:30	17-AUG-18 00:00	28	34	days	EHT
	8	14-JUL-18 11:00	16-AUG-18 00:00	28	33	days	EHT
	9	14-JUL-18 13:00	16-AUG-18 00:00	28	32	days	EHT
	10	14-JUL-18 14:30	16-AUG-18 00:00	28	32	days	EHT
	11	14-JUL-18 15:00	16-AUG-18 00:00	28	32	days	EHT
	12	14-JUL-18 16:00	16-AUG-18 00:00	28	32	days	EHT
	13	16-JUL-18 10:30	16-AUG-18 00:00	28	31	days	EHT
	14	16-JUL-18 12:00	16-AUG-18 00:00	28	31	days	EHT
	15	13-JUL-18 16:00	16-AUG-18 00:00	28	33	days	EHT
	16	16-JUL-18 13:00	16-AUG-18 00:00	28	30	days	EHT
	17	13-JUL-18 11:30	16-AUG-18 00:00	28	34	days	EHT

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Anions and Nutrients							
Total P in Water by Colour							
	18	13-JUL-18 13:30	16-AUG-18 00:00	28	33	days	EHT
	20	17-JUL-18 10:00	16-AUG-18 00:00	28	30	days	EHT
pH, Conductivity and Total Alkalinity							
	1	15-JUL-18 11:30	30-JUL-18 09:00	14	15	days	EHT
	2	15-JUL-18 10:30	30-JUL-18 09:00	14	15	days	EHT
	3	15-JUL-18 00:45	30-JUL-18 09:00	14	15	days	EHT
	4	15-JUL-18 13:45	30-JUL-18 09:00	14	15	days	EHT
	5	15-JUL-18 14:45	30-JUL-18 09:00	14	15	days	EHT
	6	15-JUL-18 15:45	30-JUL-18 09:00	14	15	days	EHT
	7	14-JUL-18 10:30	30-JUL-18 09:00	14	16	days	EHT
	8	14-JUL-18 11:00	30-JUL-18 09:00	14	16	days	EHT
	9	14-JUL-18 13:00	30-JUL-18 09:00	14	16	days	EHT
	10	14-JUL-18 14:30	30-JUL-18 09:00	14	16	days	EHT
	11	14-JUL-18 15:00	30-JUL-18 09:00	14	16	days	EHT
	12	14-JUL-18 16:00	30-JUL-18 09:00	14	16	days	EHT
	15	13-JUL-18 16:00	30-JUL-18 09:00	14	17	days	EHT
	17	13-JUL-18 11:30	30-JUL-18 09:00	14	17	days	EHT
	18	13-JUL-18 13:30	30-JUL-18 09:00	14	17	days	EHT
Organic / Inorganic Carbon							
Dissolved Organic Carbon by Combustion							
	2	15-JUL-18 10:30	20-AUG-18 15:00	28	36	days	EHT
	3	15-JUL-18 00:45	15-AUG-18 15:00	28	32	days	EHT
	4	15-JUL-18 13:45	15-AUG-18 15:00	28	31	days	EHT
	5	15-JUL-18 14:45	15-AUG-18 15:00	28	31	days	EHT
	6	15-JUL-18 15:45	15-AUG-18 15:00	28	31	days	EHT
	7	14-JUL-18 10:30	15-AUG-18 15:00	28	32	days	EHT
	8	14-JUL-18 11:00	15-AUG-18 15:00	28	32	days	EHT
	9	14-JUL-18 13:00	15-AUG-18 15:00	28	32	days	EHT
	10	14-JUL-18 14:30	15-AUG-18 15:00	28	32	days	EHT
	11	14-JUL-18 15:00	15-AUG-18 15:00	28	32	days	EHT
	12	14-JUL-18 16:00	15-AUG-18 15:00	28	32	days	EHT
	13	16-JUL-18 10:30	15-AUG-18 15:00	28	30	days	EHT
	14	16-JUL-18 12:00	15-AUG-18 15:00	28	30	days	EHT
	15	13-JUL-18 16:00	15-AUG-18 15:00	28	33	days	EHT
	16	16-JUL-18 13:00	15-AUG-18 15:00	28	30	days	EHT
	17	13-JUL-18 11:30	15-AUG-18 15:00	28	33	days	EHT
	18	13-JUL-18 13:30	15-AUG-18 15:00	28	33	days	EHT
	20	17-JUL-18 10:00	15-AUG-18 15:00	28	29	days	EHT
Total Organic Carbon by Combustion							
	2	15-JUL-18 10:30	15-AUG-18 15:00	28	31	days	EHT
	3	15-JUL-18 00:45	15-AUG-18 15:00	28	32	days	EHT
	4	15-JUL-18 13:45	15-AUG-18 15:00	28	31	days	EHT
	5	15-JUL-18 14:45	15-AUG-18 15:00	28	31	days	EHT
	6	15-JUL-18 15:45	15-AUG-18 15:00	28	31	days	EHT
	7	14-JUL-18 10:30	15-AUG-18 15:00	28	32	days	EHT
	8	14-JUL-18 11:00	15-AUG-18 15:00	28	32	days	EHT
	9	14-JUL-18 13:00	15-AUG-18 15:00	28	32	days	EHT
	10	14-JUL-18 14:30	15-AUG-18 15:00	28	32	days	EHT
	11	14-JUL-18 15:00	15-AUG-18 15:00	28	32	days	EHT
	12	14-JUL-18 16:00	15-AUG-18 15:00	28	32	days	EHT
	13	16-JUL-18 10:30	15-AUG-18 15:00	28	30	days	EHT
	14	16-JUL-18 12:00	15-AUG-18 15:00	28	30	days	EHT
	15	13-JUL-18 16:00	15-AUG-18 15:00	28	33	days	EHT
	16	16-JUL-18 13:00	15-AUG-18 15:00	28	30	days	EHT
	17	13-JUL-18 11:30	15-AUG-18 15:00	28	33	days	EHT
	18	13-JUL-18 13:30	15-AUG-18 15:00	28	33	days	EHT

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Organic / Inorganic Carbon							
Total Organic Carbon by Combustion							
	20	17-JUL-18 10:00	15-AUG-18 15:00	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 L2131670 were received on 18-JUL-18 21:30.

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

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 1 of 2

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Golder Associates Ltd.	Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Zenovia Craciunescu/Kerrie Serben	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	16820 107 Avenue Edmonton, Alberta, Canada T5P 4C3	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
		Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	+1 780 930 6786/ +1 306 667 1531	Email 1 or Fax	mkeefe@sabinagoldsilver.com	Specify Date Required for E2,E or P:
		Email 2	zcraciunescu@golder.com; Kerrie_Serben@golder.com	

Invoice To		Invoice Distribution		Analysis Request
	Same as Report To ☐ Yes ☑ No	Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☐ Yes ☑ No	Email 1 or Fax	mkeefe@sabinagoldsilver.com	
Company:	Sabina Gold and Silver	Email 2		
Contact:	Merle Keefe (604 998 4190) mkeefe@sabinagoldsilver.com	**Oil and Gas Required Fields (client use)**		
Project Information		Approver ID:	Cost Center:	
ALS Bottle Order	BR210169/ Quote: Q63297	GL Account:	Routing Code:	
Job #:	1787890/2100	Activity Code:		
PO / AFE:		Location:		
LSD:				

ALS Lab Work Order # (lab use only) L2131670 | **ALS Contact:** Jessica Spira | **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	GLD-CAL-WQ-MET-DU-ED	GLD-CAL-WQ-MET-TU-ED	GLD-CAL-WQ-NUT-ED	GLD-CAL-WQ-ROU-ED	HG-D-U-CVAF-VA	HG-T-U-CVAF-VA	N-T-CALC-ED	PO4-DO-L-COL-ED	SILICATE-L-COL-ED	Cyanides	Radium-226	[illegible]		Number of Containers
1	BRP-40-1	15-July-18	11:30	Water														11
2	BRP-40-1-1	15-July-18	10:30	Water														11
3	BRP-40-2	15-July-18	12:45	Water														11
4	BRP-40-3	15-July-18	13:45	Water														11
5	BRP-40-4	15-July-18	14:45	Water														11
6	BRP-40-5	15-July-18	15:45	Water														11
7	BRP-34a	14-July-18	10:30	Water														11
8	BRP-34b	14-July-18	11:00	Water														11
9	BRP-39	14-July-18	13:00	Water														11
10	BRP-18	14-July-18	14:30	Water														11
11	BRP-18-1	14-July-18	15:00	Water														11
12	BRP-23	14-July-18	16:00	Water														11

L2131670-COFC

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

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

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

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

4 coolers

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
4.8					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: M. DONNER	Date: 17-JULY-18	Time: 10:00	Received by:	Date: July 18/18	Time: 0930	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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

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

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

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 2 of 2

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Golder Associates Ltd.	Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Zenovia Craciunescu/Kerrie Serben	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	16820 107 Avenue Edmonton, Alberta, Canada T5P 4C3	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
Phone:	+1 780 930 6786/ +1 306 667 1531	Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
		Email 1 or Fax	mkeefe@sabinagoldsilver.com	Specify Date Required for E2,E or P:
		Email 2	zcraciunescu@golder.com; Kerrie_Serben@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:	Sabina Gold and Silver	Email 1 or Fax	mkeefe@sabinagoldsilver.com
Contact:	Merle Keefe (604 998 4190) mkeefe@sabinagoldsilver.com	Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Bottle Order	BR210169/ Quote: Q63297	Approver ID:	Cost Center:
Job #:	1787890/2100	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): L2131670 **ALS Contact:** Jessica Spira **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	GLD-CAL-WQ-MET-DU-ED	GLD-CAL-WQ-MET-TU-ED	GLD-CAL-WQ-NUT-ED	GLD-CAL-WQ-ROU-ED	HG-D-U-CVAF-VA	HG-T-U-CVAF-VA	N-T-CALC-ED	PO4-DO-L-COL-ED	SILICATE-L-COL-ED	Cyanides	Radium-226	Chlorophyll a		Number of Containers
13	BRP-29-1	16-Jul-18	10:30	Water														11
14	BRP-29-2	16-July-18	12:00	Water														11
15	BRP-29-3	13-Jul-18	~~[illegible]~~ 16:00	Water														11
16	BRP-29-4	16-Jul-18	13:00	Water														11
17	BRP-29-5	13-Jul-18	11:30	Water														11
18	BRP-29-6	13-Jul-18	13:30	Water														11
19	TRIP BLANK	—	—	Water														11
20	~~BRP-TB1~~	17-Jul-18	10:00	Water														11
				Water														
				Water														
				Water														
				Water														

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

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

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

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

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

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

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
4.8					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: M. DONNER	Date: 17-Jul-18	Time: 10:00	Received by:	Date: July 18/18	Time: 0930	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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NA-FM-0326e v09 Front04 January 2014

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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**.

[redacted]

GOLDER ASSOCIATES LTD
ATTN: Zenovia Craciunescu / Kerrie Serbin
16820 107 Ave NW
EDMONTON AB T5P 4C3

Date Received: 15-AUG-18
Report Date: 28-SEP-18 11:47 (MT)
Version: FINAL

Client Phone: 306-667-1531

Certificate of Analysis

Lab Work Order #: L2147304

Project P.O. #: NOT SUBMITTED
Job Reference: 1787890/2300
C of C Numbers:
Legal Site Desc:

[redacted]

PL

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[redacted]

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2147304-1 BRP-33-5							
Sampled By: CLIENT on 10-AUG-18 @ 08:40							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.00439		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	0.000089		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000230		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.00593		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	0.0015		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	3.10		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	0.000104		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.000064		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00037		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.0044		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	0.000014		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00087		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	1.98		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.00131		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00283		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.415		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	0.780		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.0148		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	<0.0030	DLB	0.0030	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	0.187		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	3.45		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.20		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	3.03		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.141		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0050		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0047		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							

* 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
L2147304-1 BRP-33-5							
Sampled By: CLIENT on 10-AUG-18 @ 08:40							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	2.35		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	5.5		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	15.9		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	20.7			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	8.67		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	33		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		18-AUG-18	R4177508
Turbidity							
Turbidity	0.61		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.80		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	40.7		2.0	uS/cm		18-AUG-18	R4175983
Bicarbonate (HCO3)	6.8		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	5.6		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	5.05		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Free	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Ra-226	<0.0049		0.0049	Bq/L	13-SEP-18	20-SEP-18	R4203163
Silicate (as SiO2)	0.395		0.010	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Mercury (Hg)-Total	0.00058		0.00050	ug/L		21-AUG-18	R4179640
Total Nitrogen	0.141		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.71		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00863		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000211		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.00582		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	<0.0010		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4215481

* 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
L2147304-1 BRP-33-5							
Sampled By: CLIENT on 10-AUG-18 @ 08:40							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Cobalt (Co)-Total	0.000083		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00135		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	0.0220		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.00217		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00301		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.0149		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	0.00104		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00069		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-2 BRP-23							
Sampled By: CLIENT on 11-AUG-18 @ 14:20							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.0346		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000391		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.0223		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	0.0016		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	0.0000078		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	9.55		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	0.000208		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.00155		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00101		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.192		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	0.000018		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00107		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	4.34		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.0333		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00438		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.367		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	1.10		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.0432		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206

* 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
L2147304-2 BRP-23							
Sampled By: CLIENT on 11-AUG-18 @ 14:20							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	0.00017		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	0.000188		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	<0.0010	DLB	0.0010	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	0.849		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	3.63		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	0.000090		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.88		0.10	mg/L		26-AUG-18	R4184711
Sulfur (S)-Total	3.32		0.50	mg/L		26-AUG-18	R4184711
Zirconium (Zr)-Total	0.000073		0.000060	mg/L		26-AUG-18	R4184711
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0172		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.832		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0051		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0363		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	21.8		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	21.7		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	41.7		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	48.8			mg/L		08-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	9.22		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	0.0058		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	92		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	42.5		3.0	mg/L		18-AUG-18	R4177508
Turbidity							
Turbidity	7.10		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.62		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	102		2.0	uS/cm		18-AUG-18	R4175983

* 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
L2147304-2 BRP-23							
Sampled By: CLIENT on 11-AUG-18 @ 14:20							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Bicarbonate (HCO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	4.0		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	6.30		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Free	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Ra-226	0.0063		0.0059	Bq/L	13-SEP-18	20-SEP-18	R4203163
Silicate (as SiO2)	1.87	DLHC	0.050	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Mercury (Hg)-Total	0.00091		0.00050	ug/L		21-AUG-18	R4179640
Total Nitrogen	0.832		0.050	mg/L		04-SEP-18	
Total Organic Carbon	7.13		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.365		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000897		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.0285		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	0.000025		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	0.0024		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	0.0000346		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	0.00105		0.000060	mg/L		12-SEP-18	R4215481
Cobalt (Co)-Total	0.00389		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00335		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	2.31		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	0.000244		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	0.00067		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.0702		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00798		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.0450		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	0.0000057		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	0.0135		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	0.000045		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	0.00200		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	0.00433		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00334	DTC	0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-3 BRP-34-A							
Sampled By: CLIENT on 11-AUG-18 @ 14:45							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							

* 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
L2147304-3 BRP-34-A							
Sampled By: CLIENT on 11-AUG-18 @ 14:45							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.00534		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000195		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.00491		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	0.0010		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	0.0000075		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	2.99		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	0.000076		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.000075		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00099		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.0232		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00080		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	1.95		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.00219		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00231		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.386		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	0.735		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.0144		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	0.194		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	3.17		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.20		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	2.42		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.221		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0032		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0046		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							

* 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
L2147304-3 BRP-34-A							
Sampled By: CLIENT on 11-AUG-18 @ 14:45							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	2.33		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	7.0		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	15.5		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	18.8			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	7.96		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	38		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		18-AUG-18	R4177508
Turbidity							
Turbidity	0.60		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.68		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	38.2		2.0	uS/cm		18-AUG-18	R4175983
Bicarbonate (HCO3)	5.0		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	4.1		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0018		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	4.35		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Free	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Ra-226	<0.0067		0.0067	Bq/L	13-SEP-18	20-SEP-18	R4203163
Silicate (as SiO2)	0.440		0.010	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		21-AUG-18	R4179640
Total Nitrogen	0.221		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.32		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00734		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000219		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.00528		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	<0.0010		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	0.000075		0.000060	mg/L		12-SEP-18	R4215481

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2147304-3 BRP-34-A							
Sampled By: CLIENT on 11-AUG-18 @ 14:45							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Cobalt (Co)-Total	0.000133		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00111		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	0.0667		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.00350		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00238		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.0142		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00069		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-4 BRP-34-B							
Sampled By: CLIENT on 11-AUG-18 @ 15:10							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.00541		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000207		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.00489		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	0.0000059		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	2.88		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	0.000088		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.000099		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00104		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.0287		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00077		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	1.86		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.00237		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00227		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.358		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	0.714		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.0141		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206

* 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
L2147304-4 BRP-34-B							
Sampled By: CLIENT on 11-AUG-18 @ 15:10							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	0.203		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	2.91		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.21		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	2.73		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.166		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0035		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0049		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	2.32		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	6.7		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	14.8		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	18.2			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	7.58		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	41		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		18-AUG-18	R4177508
Turbidity							
Turbidity	0.49		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.69		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	38.6		2.0	uS/cm		18-AUG-18	R4175983

* 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
L2147304-4 BRP-34-B							
Sampled By: CLIENT on 11-AUG-18 @ 15:10							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Bicarbonate (HCO3)	5.1		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	4.2		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0017		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	4.25		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Free	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Ra-226	<0.0064		0.0064	Bq/L	13-SEP-18	20-SEP-18	R4203163
Silicate (as SiO2)	0.435		0.010	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Mercury (Hg)-Total	0.00061		0.00050	ug/L		21-AUG-18	R4179640
Total Nitrogen	0.166		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.35		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00814		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000213		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.00516		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	<0.0010		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4215481
Cobalt (Co)-Total	0.000140		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00107		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	0.0702		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.00364		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00240		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.0143		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00052		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-5 BRP-39-A							
Sampled By: CLIENT on 11-AUG-18 @ 15:45							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							

* 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
L2147304-5 BRP-39-A							
Sampled By: CLIENT on 11-AUG-18 @ 15:45							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.00569		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000246		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.00371		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	2.01		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	0.000077		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.000072		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00050		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.101		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00061		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	1.71		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.00354		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00110		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.280		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	0.608		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.00675		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	0.486		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	2.57		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.50		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	2.17		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0054		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.266		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0062		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0074		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							

* 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
L2147304-5 BRP-39-A							
Sampled By: CLIENT on 11-AUG-18 @ 15:45							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	0.55		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	12.0		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	12.1		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	13.9			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	5.43		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	32		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	7.4		3.0	mg/L		18-AUG-18	R4177508
Turbidity							
Turbidity	0.74		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.84		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	29.4		2.0	uS/cm		18-AUG-18	R4175983
Bicarbonate (HCO3)	6.8		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	5.6		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	5.11		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Free	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Ra-226	<0.0072		0.0072	Bq/L	13-SEP-18	20-SEP-18	R4203163
Silicate (as SiO2)	1.07	DLHC	0.050	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Mercury (Hg)-Total	0.00074		0.00050	ug/L		21-AUG-18	R4179640
Total Nitrogen	0.266		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.59		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00883		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000242		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.00412		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	<0.0010		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	0.000124		0.000060	mg/L		12-SEP-18	R4215481

* 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
L2147304-5 BRP-39-A							
Sampled By: CLIENT on 11-AUG-18 @ 15:45							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Cobalt (Co)-Total	0.000127		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00060		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	0.194		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	0.000011		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.00462		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00114		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.00685		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	0.00014		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00060		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-6 BRP-39-B							
Sampled By: CLIENT on 11-AUG-18 @ 15:45							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.00582		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000222		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.00378		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	2.05		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	0.000083		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.000076		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00054		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.102		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	0.000010		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00062		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	1.77		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.00355		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00112		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.285		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	0.605		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.00684		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206

* 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
L2147304-6 BRP-39-B							
Sampled By: CLIENT on 11-AUG-18 @ 15:45							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	0.000054		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	0.450		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	2.60		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.54		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	2.34		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.283		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0054		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0070		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	0.59		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	13.5		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	12.4		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	14.1			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	5.52		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	32		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		18-AUG-18	R4177508
Turbidity							
Turbidity	0.83		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.93		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	30.9		2.0	uS/cm		18-AUG-18	R4175983

* 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
L2147304-6 BRP-39-B							
Sampled By: CLIENT on 11-AUG-18 @ 15:45							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Bicarbonate (HCO3)	6.6		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	5.4		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	4.21		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Free	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Ra-226	<0.0068		0.0068	Bq/L	13-SEP-18	20-SEP-18	R4203163
Silicate (as SiO2)	1.11	DLHC	0.050	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Mercury (Hg)-Total	0.00077		0.00050	ug/L		21-AUG-18	R4179640
Total Nitrogen	0.283		0.050	mg/L		04-SEP-18	
Total Organic Carbon	5.00		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00869		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000246		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.00430		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	<0.0010		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	0.000095		0.000060	mg/L		12-SEP-18	R4215481
Cobalt (Co)-Total	0.000151		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00068		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	0.201		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	0.000011		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.00511		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00131		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.00716		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	0.00014		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	0.000053		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00064		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-7 BRP-18							
Sampled By: CLIENT on 11-AUG-18 @ 14:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							

* 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
L2147304-7 BRP-18							
Sampled By: CLIENT on 11-AUG-18 @ 14:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.0181		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000191		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.0138		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	0.0024		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	0.0000253		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	7.65		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	0.000103		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.000433		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00182		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.0054		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00128		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	3.55		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.00290		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00746		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.572		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	1.11		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.0398		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	0.00319		0.00080	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	1.32		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	5.35		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	0.000065		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	1.39		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	4.62		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	0.000073		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.050		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0040		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0033		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							

* 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
L2147304-7 BRP-18							
Sampled By: CLIENT on 11-AUG-18 @ 14:00							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	9.73		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	5.0		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	33.7		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	39.1			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.244		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	12.2		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	68		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		18-AUG-18	R4177508
Turbidity							
Turbidity	0.39		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.76		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	83.7		2.0	uS/cm		18-AUG-18	R4175983
Bicarbonate (HCO3)	6.6		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	5.4		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	3.19		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Free	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Ra-226	<0.0065		0.0065	Bq/L	13-SEP-18	20-SEP-18	R4203163
Silicate (as SiO2)	3.5		1.0	mg/L		19-AUG-18	R4176406
Cyanide, Total	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Mercury (Hg)-Total	0.00095		0.00050	ug/L		21-AUG-18	R4179640
Total Nitrogen	0.244		0.050	mg/L		04-SEP-18	
Total Organic Carbon	3.27		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0272		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000218		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.0145		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	0.0020		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	0.0000267		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	0.000103		0.000060	mg/L		12-SEP-18	R4215481

* 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
L2147304-7 BRP-18							
Sampled By: CLIENT on 11-AUG-18 @ 14:00							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Cobalt (Co)-Total	0.000444		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00189		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	0.0211		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	0.000013		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.00285		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00731		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.0394		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	0.00038		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	0.00329		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00098		0.00050	ug/L	18-AUG-18	22-SEP-18	R4180650
L2147304-8 BRP-19							
Sampled By: CLIENT on 11-AUG-18 @ 13:40							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.165		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000402		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.0265		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	0.000016		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	0.0019		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	0.0000222		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	7.31		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	0.000593		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.00313		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00265		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.103		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	0.000010		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00152		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	4.33		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.0291		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00808		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.143		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	1.30		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.0437		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206

* 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
L2147304-8 BRP-19							
Sampled By: CLIENT on 11-AUG-18 @ 13:40							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	0.00044		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	0.000012		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	0.000232		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	0.00392		0.00080	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	2.26		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	6.12		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	0.000331		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	2.37		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	5.48		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	0.000308		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0110		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.637		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0078		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0121		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	12.0		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	51.1		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	36.1		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	39.7			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	14.6		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	0.0030		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	105		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		18-AUG-18	R4177508
Turbidity							
Turbidity	0.63		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	5.58		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	88.5		2.0	uS/cm		18-AUG-18	R4175983

* 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
L2147304-8 BRP-19							
Sampled By: CLIENT on 11-AUG-18 @ 13:40							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Bicarbonate (HCO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	14.7		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Free	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Ra-226	<0.0064		0.0064	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	5.7		1.0	mg/L		19-AUG-18	R4176406
Cyanide, Total	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Mercury (Hg)-Total	0.00300		0.00050	ug/L		21-AUG-18	R4179640
Total Nitrogen	0.637		0.050	mg/L		04-SEP-18	
Total Organic Carbon	16.0		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.161		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000388		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.0278		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	0.000015		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	0.0015		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	0.0000196		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	0.000566		0.000060	mg/L		12-SEP-18	R4215481
Cobalt (Co)-Total	0.00315		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00262		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	0.222		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	0.00066		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.0292		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00804		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.0441		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	0.00054		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	0.000212		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	0.00388		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00349		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-9 BRP-QC-1							
Sampled By: CLIENT on 11-AUG-18 @ 16:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							

* 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
L2147304-9 BRP-QC-1							
Sampled By: CLIENT on 11-AUG-18 @ 16:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	<0.00030		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	<0.020		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	<0.0010		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	<0.0040		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	<0.020		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	<0.020	DLB	0.020	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	<0.050		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	<0.50		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	<0.10		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	<0.50		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.050		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	<0.0010		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	<0.0010		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							

* 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
L2147304-9 BRP-QC-1							
Sampled By: CLIENT on 11-AUG-18 @ 16:00							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	<2.0		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	<0.053		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	<1.0			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	<0.050		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	<10		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		18-AUG-18	R4177508
Turbidity							
Turbidity	0.13		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	5.36		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	<2.0		2.0	uS/cm		18-AUG-18	R4175983
Bicarbonate (HCO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	<0.50		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Free	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Ra-226	<0.0051		0.0051	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	<0.010		0.010	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	<0.050		0.050	mg/L		04-SEP-18	
Total Organic Carbon	<0.50		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	<0.00030		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	<0.0010		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4215481

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2147304-9 BRP-QC-1							
Sampled By: CLIENT on 11-AUG-18 @ 16:00							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Cobalt (Co)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	<0.00010		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	<0.0010		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	18-AUG-18	22-SEP-18	R4180650
L2147304-10 TRIP BLANK							
Sampled By: CLIENT on 14-AUG-18 @ 11:45							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.00055		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	0.0015		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	<0.020		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00017		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	<0.0010		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	0.000010		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	<0.0040		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.020		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	0.150		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.000073		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206

* 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
L2147304-10 TRIP BLANK							
Sampled By: CLIENT on 14-AUG-18 @ 11:45							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	<0.050		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	<0.50		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	<0.10		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	<0.50		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.050		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0020	RRV	0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0022	RRV	0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	<2.0		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	<0.053		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	<1.0			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		21-AUG-18	R4180079
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	<0.050		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	<10		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		20-AUG-18	R4179142
Turbidity							
Turbidity	<0.10		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	5.51		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	<2.0		2.0	uS/cm		18-AUG-18	R4175983

* 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
L2147304-10 TRIP BLANK							
Sampled By: CLIENT on 14-AUG-18 @ 11:45							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Bicarbonate (HCO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	<0.50		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Free	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Ra-226	<0.0063		0.0063	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	<0.010		0.010	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	<0.050		0.050	mg/L		04-SEP-18	
Total Organic Carbon	<0.50		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	<0.00030		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	0.0015		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4215481
Cobalt (Co)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00014		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	<0.0010		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-11 BRP-31-1							
Sampled By: CLIENT on 12-AUG-18 @ 08:45							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							

* 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
L2147304-11 BRP-31-1							
Sampled By: CLIENT on 12-AUG-18 @ 08:45							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.00512		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	0.000083		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000181		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.00671		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	0.0016		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	3.61		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	0.000104		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.000094		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00117		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.0038		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00092		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	1.53		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.00209		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00230		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.274		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	0.0000073		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	0.637		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.0175		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Tin (Sn)-Dissolved	0.000053		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	0.00450	DTC	0.00080	mg/L		17-SEP-18	R4220290
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	0.327		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	3.23		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.37		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	3.05		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	0.000142		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.108		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0051		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0066		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							

* 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
L2147304-11 BRP-31-1							
Sampled By: CLIENT on 12-AUG-18 @ 08:45							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	3.54		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	5.8		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	15.3		0.053	mg/L		13-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	19.7			mg/L		18-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	7.56		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	41		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	3.1		3.0	mg/L		18-AUG-18	R4177508
Turbidity							
Turbidity	0.46		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.69		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	44.7		2.0	uS/cm		18-AUG-18	R4175983
Bicarbonate (HCO3)	5.1		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	4.2		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	5.01		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Free	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Ra-226	<0.0059		0.0059	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	0.756	DLHC	0.050	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Mercury (Hg)-Total	0.00084		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	0.108		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.68		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0159		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	0.000053		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000270		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.00732		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	0.0010		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	0.0000075		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	0.000083		0.000060	mg/L		12-SEP-18	R4215481

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2147304-11 BRP-31-1							
Sampled By: CLIENT on 12-AUG-18 @ 08:45							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Cobalt (Co)-Total	0.000209		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00156		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	0.0442		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	0.000031		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.00341		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00333		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.0187		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	0.00015		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	0.00135		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00086		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-12 BRP-31-2							
Sampled By: CLIENT on 12-AUG-18 @ 09:50							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.00782		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000250		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.00673		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	0.0014		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	0.0000074		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	3.61		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	0.000079		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.000027		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00203		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.0060		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00090		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	2.10		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.000115		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00320		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.391		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	0.777		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.0186		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206

* 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
L2147304-12 BRP-31-2							
Sampled By: CLIENT on 12-AUG-18 @ 09:50							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	<0.0010	DLB	0.0010	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	0.349		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	3.60		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.35		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	3.02		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.136		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0244	DTC	0.0010	mg/L		06-SEP-18	R4204190
Total P in Water by Colour							
Phosphorus (P)-Total	0.0034	DTC	0.0010	mg/L		06-SEP-18	R4204190
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	3.57		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	6.2		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	17.7		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	20.5			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	7.88		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	43		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		18-AUG-18	R4177508
Turbidity							
Turbidity	0.48		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.73		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	45.0		2.0	uS/cm		18-AUG-18	R4175983

* 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
L2147304-12 BRP-31-2							
Sampled By: CLIENT on 12-AUG-18 @ 09:50							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Bicarbonate (HCO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	3.7		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	4.62		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Free	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Ra-226	<0.0042		0.0042	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	0.771	DLHC	0.050	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Mercury (Hg)-Total	0.00090		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	0.136		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.47		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0176		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	0.000042		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000264		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.00727		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	0.0010		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	0.000080		0.000060	mg/L		12-SEP-18	R4215481
Cobalt (Co)-Total	0.000245		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00236		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	0.0462		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	0.000023		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.00375		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00342		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.0188		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	0.00013		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	0.00106		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00088		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-13 BRP-31-3							
Sampled By: CLIENT on 12-AUG-18 @ 10:15							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							

* 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
L2147304-13 BRP-31-3							
Sampled By: CLIENT on 12-AUG-18 @ 10:15							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.00716		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000240		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.00688		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	0.0013		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	0.0000100		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	3.65		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	0.000106		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.000029		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00153		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.0037		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00090		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	2.17		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.000156		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00322		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.404		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	0.768		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.0186		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	0.362		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	3.44		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.36		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	2.90		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.197		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0035		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0070		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							

* 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
L2147304-13 BRP-31-3							
Sampled By: CLIENT on 12-AUG-18 @ 10:15							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	3.55		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	5.7		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	18.1		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	21.0			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	7.91		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	39		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	3.4		3.0	mg/L		18-AUG-18	R4177508
Turbidity							
Turbidity	0.41		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.72		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	45.7		2.0	uS/cm		18-AUG-18	R4175983
Bicarbonate (HCO3)	5.1		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	4.2		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	4.53		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Free	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Ra-226	<0.0067		0.0067	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	0.777	DLHC	0.050	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Mercury (Hg)-Total	0.00088		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	0.197		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.23		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0178		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000267		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.00738		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	<0.0010		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	0.0000083		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	0.000111		0.000060	mg/L		12-SEP-18	R4215481

* 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
L2147304-13 BRP-31-3							
Sampled By: CLIENT on 12-AUG-18 @ 10:15							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Cobalt (Co)-Total	0.000241		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00191		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	0.0575		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	0.000018		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.00442		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00374		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.0189		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	0.00016		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	0.00083		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00084		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-14 BRP-31-4							
Sampled By: CLIENT on 12-AUG-18 @ 11:15							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.00691		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000230		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.00650		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	0.0013		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	0.0000056		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	3.58		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	0.000086		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.000040		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00138		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.0024		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00092		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	2.14		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.000195		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00326		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.397		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	0.764		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.0183		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206

* 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
L2147304-14 BRP-31-4							
Sampled By: CLIENT on 12-AUG-18 @ 11:15							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	0.361		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	3.61		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.37		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	3.16		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.137		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0038		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0067		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	3.57		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	6.0		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	17.7		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	21.0			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	8.03		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	42		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		20-AUG-18	R4179142
Turbidity							
Turbidity	0.40		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.74		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	46.0		2.0	uS/cm		18-AUG-18	R4175983

* 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
L2147304-14 BRP-31-4							
Sampled By: CLIENT on 12-AUG-18 @ 11:15							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Bicarbonate (HCO3)	5.1		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	4.2		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	4.34		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Free	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Ra-226	<0.0065		0.0065	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	0.863	DLHC	0.050	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Mercury (Hg)-Total	0.00085		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	0.137		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.95		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0153		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000247		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.00713		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	0.0010		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	0.0000065		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	0.000087		0.000060	mg/L		12-SEP-18	R4215481
Cobalt (Co)-Total	0.000226		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00163		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	0.0432		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	0.000019		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.00370		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00327		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.0187		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	0.00017		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	0.00082		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00086		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-15 BRP-31-5							
Sampled By: CLIENT on 12-AUG-18 @ 12:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							

* 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
L2147304-15 BRP-31-5							
Sampled By: CLIENT on 12-AUG-18 @ 12:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.00717		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000243		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.00650		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	0.0012		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	0.0000076		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	3.57		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	0.000073		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.000027		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00127		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.0114		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	0.000016		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00089		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	2.15		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.000512		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00311		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.400		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	0.765		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.0184		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	0.324		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	3.41		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.36		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	2.99		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.186		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0057		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0059		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							

* 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
L2147304-15 BRP-31-5							
Sampled By: CLIENT on 12-AUG-18 @ 12:00							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	3.54		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	6.2		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	17.8		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	20.8			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	7.96		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	44		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		20-AUG-18	R4179142
Turbidity							
Turbidity	0.55		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.73		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	45.4		2.0	uS/cm		18-AUG-18	R4175983
Bicarbonate (HCO3)	5.0		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	4.1		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	4.51		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Free	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Ra-226	<0.0074		0.0074	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	0.791	DLHC	0.050	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Mercury (Hg)-Total	0.00080		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	0.186		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.75		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0153		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000249		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.00702		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	<0.0010		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	0.0000059		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	0.000078		0.000060	mg/L		12-SEP-18	R4215481

* 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
L2147304-15 BRP-31-5							
Sampled By: CLIENT on 12-AUG-18 @ 12:00							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Cobalt (Co)-Total	0.000222		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00146		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	0.0447		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.00360		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00326		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.0189		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	0.00015		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	0.00090		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00080		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-16 BRP-29-1							
Sampled By: CLIENT on 12-AUG-18 @ 12:50							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.00892		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000279		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.00687		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	0.0014		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	0.0000095		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	3.92		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	0.000067		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.000031		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00137		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.0059		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00098		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	2.22		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.000140		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00392		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.424		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	0.776		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.0204		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206

* 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
L2147304-16 BRP-29-1							
Sampled By: CLIENT on 12-AUG-18 @ 12:50							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	0.414		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	3.73		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.43		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	2.95		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.101		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0028		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0049		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	4.23		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	5.6		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	18.9		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	22.4			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	8.41		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	47		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		20-AUG-18	R4179142
Turbidity							
Turbidity	0.40		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.78		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	48.9		2.0	uS/cm		18-AUG-18	R4175983

* 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
L2147304-16 BRP-29-1							
Sampled By: CLIENT on 12-AUG-18 @ 12:50							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Bicarbonate (HCO3)	5.0		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	4.1		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	4.43		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Free	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Ra-226	0.043		0.0090	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	0.922	DLHC	0.050	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Mercury (Hg)-Total	0.00084		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	0.101		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.01		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0174		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000244		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.00747		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	0.0011		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	0.0000100		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	0.000099		0.000060	mg/L		12-SEP-18	R4215481
Cobalt (Co)-Total	0.000356		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00170		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	0.0411		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	0.000014		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.00376		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00422		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.0209		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	0.00013		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	0.00098		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00079		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-17 BRP-29-2							
Sampled By: CLIENT on 12-AUG-18 @ 13:30							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							

* 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
L2147304-17 BRP-29-2							
Sampled By: CLIENT on 12-AUG-18 @ 13:30							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.00698		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000255		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.00657		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	0.0015		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	0.0000067		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	3.67		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	0.000075		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.000028		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00134		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.0024		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00096		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	2.15		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.000197		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00351		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.404		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	0.764		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.0189		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	0.324		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	3.50		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.36		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	2.90		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.169		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0034		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0056		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							

* 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
L2147304-17 BRP-29-2							
Sampled By: CLIENT on 12-AUG-18 @ 13:30							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	3.66		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	5.4		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	18.0		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	21.1			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	7.99		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	46		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		20-AUG-18	R4179142
Turbidity							
Turbidity	0.42		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.74		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	46.0		2.0	uS/cm		18-AUG-18	R4175983
Bicarbonate (HCO3)	5.0		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	4.1		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	4.05		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Free	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Ra-226	0.032		0.0050	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	0.758	DLHC	0.050	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Mercury (Hg)-Total	0.00086		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	0.169		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.21		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		18-AUG-18	R4176144
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0150		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	0.000032		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000233		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.00710		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	0.0010		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	0.0000064		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	0.000079		0.000060	mg/L		12-SEP-18	R4215481

* 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
L2147304-17 BRP-29-2							
Sampled By: CLIENT on 12-AUG-18 @ 13:30							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Cobalt (Co)-Total	0.000267		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00165		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	0.0404		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	0.000015		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.00344		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00360		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.0194		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	0.00014		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	0.00104		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00080		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-18 BRP-29-3							
Sampled By: CLIENT on 12-AUG-18 @ 14:50							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.00826		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000226		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.00756		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	0.0015		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	0.0000076		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	3.82		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	0.000068		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.000035		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00136		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.0022		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00092		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	2.19		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.000310		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00365		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.408		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	0.770		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.0194		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206

* 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
L2147304-18 BRP-29-3							
Sampled By: CLIENT on 12-AUG-18 @ 14:50							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	0.354		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	3.67		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.37		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	3.19		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.208		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0031		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0054		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	3.86		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	5.5		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	18.6		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	21.7			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	8.11		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	45		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		20-AUG-18	R4179142
Turbidity							
Turbidity	0.35		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.73		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	46.9		2.0	uS/cm		18-AUG-18	R4175983

* 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
L2147304-18 BRP-29-3							
Sampled By: CLIENT on 12-AUG-18 @ 14:50							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Bicarbonate (HCO3)	5.1		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	4.2		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	4.40		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Free	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Ra-226	0.0047		0.0046	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	0.794	DLHC	0.050	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Mercury (Hg)-Total	0.00084		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	0.208		0.050	mg/L		04-SEP-18	
Total Organic Carbon	5.04		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0165		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000239		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.00732		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	0.0011		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	0.0000093		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	0.000157		0.000060	mg/L		12-SEP-18	R4215481
Cobalt (Co)-Total	0.000298		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00160		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	0.0389		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.00362		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00382		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.0201		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	0.00013		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	0.00092		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00088		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-19 BRP-32-4							
Sampled By: CLIENT on 13-AUG-18 @ 10:50							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							

* 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
L2147304-19 BRP-32-4							
Sampled By: CLIENT on 13-AUG-18 @ 10:50							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.00411		0.00030	mg/L		06-SEP-18	R4204206
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000223		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.00552		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	0.0011		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	3.04		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	0.000081		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.000021		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00114		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.0098		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00087		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	1.97		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.000123		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00292		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.378		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	0.709		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.0146		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	<0.0020	DLB	0.0020	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	0.184		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	3.19		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.20		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	2.85		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.217		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0021		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0053		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							

* 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
L2147304-19 BRP-32-4							
Sampled By: CLIENT on 13-AUG-18 @ 10:50							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	2.29		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	5.1		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	15.7		0.053	mg/L		07-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	17.8			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	7.02		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	40		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		20-AUG-18	R4179142
Turbidity							
Turbidity	0.43		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.73		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	39.4		2.0	uS/cm		18-AUG-18	R4175983
Bicarbonate (HCO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	4.0		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	4.81		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Free	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Ra-226	<0.0067		0.0067	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	0.379		0.010	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Mercury (Hg)-Total	0.00063		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	0.217		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.83		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00756		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000203		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.00574		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	<0.0010		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4215481

* 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
L2147304-19 BRP-32-4							
Sampled By: CLIENT on 13-AUG-18 @ 10:50							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Cobalt (Co)-Total	0.000094		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00136		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	0.0263		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.00227		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00320		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.0150		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00067		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-20 BRP-32-5							
Sampled By: CLIENT on 13-AUG-18 @ 11:40							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Aluminum (Al)-Dissolved	0.00316	RRV	0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		06-SEP-18	R4204206
Arsenic (As)-Dissolved	0.000202		0.000020	mg/L		06-SEP-18	R4204206
Barium (Ba)-Dissolved	0.00531		0.000050	mg/L		06-SEP-18	R4204206
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Boron (B)-Dissolved	0.0012		0.0010	mg/L		06-SEP-18	R4204206
Cadmium (Cd)-Dissolved	0.0000061		0.0000050	mg/L		06-SEP-18	R4204206
Calcium (Ca)-Dissolved	2.95		0.020	mg/L		06-SEP-18	R4204206
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Cobalt (Co)-Dissolved	0.000025		0.000010	mg/L		06-SEP-18	R4204206
Copper (Cu)-Dissolved	0.00100		0.00010	mg/L		06-SEP-18	R4204206
Iron (Fe)-Dissolved	0.0020		0.0010	mg/L		06-SEP-18	R4204206
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Lithium (Li)-Dissolved	0.00091		0.00050	mg/L		06-SEP-18	R4204206
Magnesium (Mg)-Dissolved	1.92		0.0040	mg/L		06-SEP-18	R4204206
Manganese (Mn)-Dissolved	0.000097		0.000050	mg/L		06-SEP-18	R4204206
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Nickel (Ni)-Dissolved	0.00285		0.000060	mg/L		06-SEP-18	R4204206
Potassium (K)-Dissolved	0.382		0.020	mg/L		06-SEP-18	R4204206
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		06-SEP-18	R4204206
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206
Sodium (Na)-Dissolved	0.697		0.0050	mg/L		06-SEP-18	R4204206
Strontium (Sr)-Dissolved	0.0141		0.000050	mg/L		06-SEP-18	R4204206
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		06-SEP-18	R4204206

* 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
L2147304-20 BRP-32-5							
Sampled By: CLIENT on 13-AUG-18 @ 11:40							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		06-SEP-18	R4204206
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		06-SEP-18	R4204206
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		06-SEP-18	R4204206
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		06-SEP-18	R4204206
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202067
Silicon (Si)-Dissolved	0.179		0.050	mg/L		06-SEP-18	R4204206
Sulfur (S)-Dissolved	3.35		0.50	mg/L		06-SEP-18	R4204206
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		06-SEP-18	R4204206
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.18		0.10	mg/L		12-SEP-18	R4214588
Sulfur (S)-Total	2.68		0.50	mg/L		12-SEP-18	R4214588
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		12-SEP-18	R4214588
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.157		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0026		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0072		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	2.34		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	4.7		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	15.3		0.053	mg/L		13-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	18.5			mg/L		13-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	7.73		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	40		10	mg/L		20-AUG-18	R4179259
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		20-AUG-18	R4179142
Turbidity							
Turbidity	0.49		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.73		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	39.6		2.0	uS/cm		18-AUG-18	R4175983

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2147304-20 BRP-32-5							
Sampled By: CLIENT on 13-AUG-18 @ 11:40							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Bicarbonate (HCO3)	5.1		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	4.2		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	4.42		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Free	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Ra-226	<0.0070		0.0070	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	0.388		0.010	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Mercury (Hg)-Total	0.00064		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	0.157		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.43		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00835		0.00030	mg/L		12-SEP-18	R4215481
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		12-SEP-18	R4215481
Arsenic (As)-Total	0.000214		0.000020	mg/L		12-SEP-18	R4215481
Barium (Ba)-Total	0.00572		0.000050	mg/L		12-SEP-18	R4215481
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Boron (B)-Total	<0.0010		0.0010	mg/L		12-SEP-18	R4215481
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Chromium (Cr)-Total	0.000087		0.000060	mg/L		12-SEP-18	R4215481
Cobalt (Co)-Total	0.000097		0.000010	mg/L		12-SEP-18	R4215481
Copper (Cu)-Total	0.00121		0.00010	mg/L		12-SEP-18	R4215481
Iron (Fe)-Total	0.0257		0.0010	mg/L		12-SEP-18	R4215481
Lead (Pb)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Lithium (Li)-Total	<0.00050		0.00050	mg/L		12-SEP-18	R4215481
Manganese (Mn)-Total	0.00227		0.000050	mg/L		12-SEP-18	R4215481
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Nickel (Ni)-Total	0.00298		0.000060	mg/L		12-SEP-18	R4215481
Selenium (Se)-Total	<0.000040		0.000040	mg/L		12-SEP-18	R4215481
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Strontium (Sr)-Total	0.0150		0.000050	mg/L		12-SEP-18	R4215481
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Tin (Sn)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		12-SEP-18	R4215481
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	<0.000050		0.000050	mg/L		12-SEP-18	R4215481
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		12-SEP-18	R4215481
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175841
Mercury (Hg)-Dissolved	0.00064		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-21 BRP-29-4							
Sampled By: CLIENT on 13-AUG-18 @ 13:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							

* 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
L2147304-21 BRP-29-4							
Sampled By: CLIENT on 13-AUG-18 @ 13:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	LAB					07-SEP-18	R4204662
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202539
Aluminum (Al)-Dissolved	0.00927		0.00030	mg/L		08-SEP-18	R4205640
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		05-SEP-18	R4203962
Arsenic (As)-Dissolved	0.000262		0.000020	mg/L		05-SEP-18	R4203962
Barium (Ba)-Dissolved	0.00704		0.000050	mg/L		05-SEP-18	R4203962
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Boron (B)-Dissolved	0.0020		0.0010	mg/L		05-SEP-18	R4203962
Cadmium (Cd)-Dissolved	0.0000271	DTC	0.0000050	mg/L		12-SEP-18	R4215481
Calcium (Ca)-Dissolved	3.79		0.020	mg/L		05-SEP-18	R4203962
Chromium (Cr)-Dissolved	0.000082		0.000060	mg/L		05-SEP-18	R4203962
Cobalt (Co)-Dissolved	0.000025		0.000010	mg/L		05-SEP-18	R4203962
Copper (Cu)-Dissolved	0.00120		0.00010	mg/L		05-SEP-18	R4203962
Iron (Fe)-Dissolved	0.0018		0.0010	mg/L		05-SEP-18	R4203962
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Lithium (Li)-Dissolved	0.00121		0.00050	mg/L		05-SEP-18	R4203962
Magnesium (Mg)-Dissolved	2.14		0.0040	mg/L		05-SEP-18	R4203962
Manganese (Mn)-Dissolved	0.000156		0.000050	mg/L		05-SEP-18	R4203962
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962
Nickel (Ni)-Dissolved	0.00390		0.000060	mg/L		08-SEP-18	R4205640
Potassium (K)-Dissolved	0.411		0.020	mg/L		05-SEP-18	R4203962
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		05-SEP-18	R4203962
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		05-SEP-18	R4203962
Sodium (Na)-Dissolved	0.783		0.0050	mg/L		05-SEP-18	R4203962
Strontium (Sr)-Dissolved	0.0199		0.000050	mg/L		05-SEP-18	R4203962
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		05-SEP-18	R4203962
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		05-SEP-18	R4203962
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962
Zinc (Zn)-Dissolved	0.00197		0.00080	mg/L		08-SEP-18	R4205640
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202539
Silicon (Si)-Dissolved	0.377		0.050	mg/L		05-SEP-18	R4203258
Sulfur (S)-Dissolved	3.24		0.50	mg/L		05-SEP-18	R4203258
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		05-SEP-18	R4203258
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.34		0.10	mg/L		10-SEP-18	R4209029
Sulfur (S)-Total	3.35		0.50	mg/L		10-SEP-18	R4209029
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		10-SEP-18	R4209029
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.125		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0028		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0047		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							

* 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
L2147304-21 BRP-29-4							
Sampled By: CLIENT on 13-AUG-18 @ 13:00							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	3.95		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	5.5		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	18.3		0.053	mg/L		09-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	22.0			mg/L		10-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	8.43		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	40		10	mg/L		21-AUG-18	R4180280
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		20-AUG-18	R4179142
Turbidity							
Turbidity	0.53		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.73		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	47.2		2.0	uS/cm		18-AUG-18	R4175983
Bicarbonate (HCO3)	5.1		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	4.2		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	4.43		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Free	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Ra-226	<0.0076		0.0076	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	0.816	DLHC	0.050	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Mercury (Hg)-Total	0.00083		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	0.125		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.37		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0167		0.00030	mg/L		10-SEP-18	R4209029
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		10-SEP-18	R4209029
Arsenic (As)-Total	0.000262		0.000020	mg/L		10-SEP-18	R4209029
Barium (Ba)-Total	0.00725		0.000050	mg/L		10-SEP-18	R4209029
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Boron (B)-Total	0.0021		0.0010	mg/L		10-SEP-18	R4209029
Cadmium (Cd)-Total	0.0000065		0.0000050	mg/L		10-SEP-18	R4209029
Chromium (Cr)-Total	0.000081		0.000060	mg/L		10-SEP-18	R4209029

* 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
L2147304-21 BRP-29-4							
Sampled By: CLIENT on 13-AUG-18 @ 13:00							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Cobalt (Co)-Total	0.000318		0.000010	mg/L		10-SEP-18	R4209029
Copper (Cu)-Total	0.00153		0.00010	mg/L		10-SEP-18	R4209029
Iron (Fe)-Total	0.0363		0.0010	mg/L		10-SEP-18	R4209029
Lead (Pb)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Lithium (Li)-Total	0.00057		0.00050	mg/L		10-SEP-18	R4209029
Manganese (Mn)-Total	0.00380		0.000050	mg/L		10-SEP-18	R4209029
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Nickel (Ni)-Total	0.00385		0.000060	mg/L		10-SEP-18	R4209029
Selenium (Se)-Total	<0.000040		0.000040	mg/L		10-SEP-18	R4209029
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		10-SEP-18	R4209029
Strontium (Sr)-Total	0.0202		0.000050	mg/L		10-SEP-18	R4209029
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		10-SEP-18	R4209029
Tin (Sn)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Titanium (Ti)-Total	0.00010		0.00010	mg/L		10-SEP-18	R4209029
Uranium (U)-Total	<0.000010		0.000010	mg/L		12-SEP-18	R4215481
Vanadium (V)-Total	0.000056		0.000050	mg/L		10-SEP-18	R4209029
Zinc (Zn)-Total	0.00091		0.00080	mg/L		10-SEP-18	R4209029
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175844
Mercury (Hg)-Dissolved	0.00078		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-22 BRP-QC-3							
Sampled By: CLIENT on 13-AUG-18 @ 09:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202539
Dissolved Metals Filtration Location	LAB					07-SEP-18	R4204662
Aluminum (Al)-Dissolved	0.00031		0.00030	mg/L		05-SEP-18	R4203962
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		05-SEP-18	R4203962
Arsenic (As)-Dissolved	<0.000020		0.000020	mg/L		05-SEP-18	R4203962
Barium (Ba)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		05-SEP-18	R4203962
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		05-SEP-18	R4203962
Calcium (Ca)-Dissolved	<0.020		0.020	mg/L		05-SEP-18	R4203962
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		05-SEP-18	R4203962
Cobalt (Co)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Copper (Cu)-Dissolved	<0.00010		0.00010	mg/L		05-SEP-18	R4203962
Iron (Fe)-Dissolved	<0.0010		0.0010	mg/L		05-SEP-18	R4203962
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		05-SEP-18	R4203962
Magnesium (Mg)-Dissolved	<0.0040		0.0040	mg/L		05-SEP-18	R4203962
Manganese (Mn)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962
Nickel (Ni)-Dissolved	<0.000060		0.000060	mg/L		05-SEP-18	R4203962
Potassium (K)-Dissolved	<0.020		0.020	mg/L		05-SEP-18	R4203962
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		05-SEP-18	R4203962
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		05-SEP-18	R4203962
Sodium (Na)-Dissolved	0.0091		0.0050	mg/L		05-SEP-18	R4203962
Strontium (Sr)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962

* 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
L2147304-22 BRP-QC-3							
Sampled By: CLIENT on 13-AUG-18 @ 09:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		05-SEP-18	R4203962
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		05-SEP-18	R4203962
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		05-SEP-18	R4203962
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202539
Silicon (Si)-Dissolved	<0.050		0.050	mg/L		05-SEP-18	R4203258
Sulfur (S)-Dissolved	<0.50		0.50	mg/L		05-SEP-18	R4203258
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		05-SEP-18	R4203258
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	<0.10		0.10	mg/L		10-SEP-18	R4209029
Sulfur (S)-Total	<0.50		0.50	mg/L		10-SEP-18	R4209029
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		10-SEP-18	R4209029
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.050		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	<0.0010		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	<0.0010		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	<2.0		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	<0.053		0.053	mg/L		09-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	<1.0			mg/L		12-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	<0.050		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	<10		10	mg/L		21-AUG-18	R4180280
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		20-AUG-18	R4179142
Turbidity							
Turbidity	<0.10		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	5.29		0.10	pH		18-AUG-18	R4175983

* 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
L2147304-22 BRP-QC-3							
Sampled By: CLIENT on 13-AUG-18 @ 09:00							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Conductivity (EC)	<2.0		2.0	uS/cm		18-AUG-18	R4175983
Bicarbonate (HCO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	<0.50		0.50	mg/L		12-SEP-18	R4214325
Cyanide, Free	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Ra-226	<0.0044		0.0044	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	<0.010		0.010	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	<0.050		0.050	mg/L		04-SEP-18	
Total Organic Carbon	<0.50		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	<0.00030		0.00030	mg/L		10-SEP-18	R4209029
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		10-SEP-18	R4209029
Arsenic (As)-Total	<0.000020		0.000020	mg/L		10-SEP-18	R4209029
Barium (Ba)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Boron (B)-Total	<0.0010		0.0010	mg/L		10-SEP-18	R4209029
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		10-SEP-18	R4209029
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		10-SEP-18	R4209029
Cobalt (Co)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Copper (Cu)-Total	<0.00010		0.00010	mg/L		10-SEP-18	R4209029
Iron (Fe)-Total	<0.0010		0.0010	mg/L		10-SEP-18	R4209029
Lead (Pb)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Lithium (Li)-Total	<0.00050		0.00050	mg/L		10-SEP-18	R4209029
Manganese (Mn)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Nickel (Ni)-Total	<0.000060		0.000060	mg/L		10-SEP-18	R4209029
Selenium (Se)-Total	<0.000040		0.000040	mg/L		10-SEP-18	R4209029
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		10-SEP-18	R4209029
Strontium (Sr)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		10-SEP-18	R4209029
Tin (Sn)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		10-SEP-18	R4209029
Uranium (U)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Vanadium (V)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		10-SEP-18	R4209029
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175844
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-23 BRP-32-1							
Sampled By: CLIENT on 13-AUG-18 @ 08:45							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							

* 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
L2147304-23 BRP-32-1							
Sampled By: CLIENT on 13-AUG-18 @ 08:45							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202539
Dissolved Metals Filtration Location	LAB					07-SEP-18	R4204662
Aluminum (Al)-Dissolved	0.00484		0.00030	mg/L		08-SEP-18	R4205640
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		05-SEP-18	R4203962
Arsenic (As)-Dissolved	0.000213		0.000020	mg/L		05-SEP-18	R4203962
Barium (Ba)-Dissolved	0.00571		0.000050	mg/L		05-SEP-18	R4203962
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Boron (B)-Dissolved	0.0017		0.0010	mg/L		05-SEP-18	R4203962
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Calcium (Ca)-Dissolved	2.99		0.020	mg/L		05-SEP-18	R4203962
Chromium (Cr)-Dissolved	0.000076		0.000060	mg/L		05-SEP-18	R4203962
Cobalt (Co)-Dissolved	0.000025		0.000010	mg/L		05-SEP-18	R4203962
Copper (Cu)-Dissolved	0.00096		0.00010	mg/L		05-SEP-18	R4203962
Iron (Fe)-Dissolved	0.0018		0.0010	mg/L		05-SEP-18	R4203962
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Lithium (Li)-Dissolved	0.00106		0.00050	mg/L		05-SEP-18	R4203962
Magnesium (Mg)-Dissolved	1.93		0.0040	mg/L		05-SEP-18	R4203962
Manganese (Mn)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962
Nickel (Ni)-Dissolved	0.00353		0.000060	mg/L		08-SEP-18	R4205640
Potassium (K)-Dissolved	0.383		0.020	mg/L		05-SEP-18	R4203962
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		05-SEP-18	R4203962
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		05-SEP-18	R4203962
Sodium (Na)-Dissolved	0.717		0.0050	mg/L		05-SEP-18	R4203962
Strontium (Sr)-Dissolved	0.0148		0.000050	mg/L		05-SEP-18	R4203962
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		05-SEP-18	R4203962
Tin (Sn)-Dissolved	0.000084		0.000050	mg/L		05-SEP-18	R4203962
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		05-SEP-18	R4203962
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Vanadium (V)-Dissolved	0.000051		0.000050	mg/L		05-SEP-18	R4203962
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		05-SEP-18	R4203962
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202539
Silicon (Si)-Dissolved	0.176		0.050	mg/L		05-SEP-18	R4203258
Sulfur (S)-Dissolved	2.65		0.50	mg/L		05-SEP-18	R4203258
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		05-SEP-18	R4203258
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.18		0.10	mg/L		10-SEP-18	R4209029
Sulfur (S)-Total	2.88		0.50	mg/L		10-SEP-18	R4209029
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		10-SEP-18	R4209029
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.130		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0050		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0051		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							

* 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
L2147304-23 BRP-32-1							
Sampled By: CLIENT on 13-AUG-18 @ 08:45							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	2.33		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	4.5		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	15.4		0.053	mg/L		09-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	18.2			mg/L		10-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	7.37		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	47		10	mg/L		21-AUG-18	R4180280
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		20-AUG-18	R4179142
Turbidity							
Turbidity	0.45		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.68		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	39.8		2.0	uS/cm		18-AUG-18	R4175983
Bicarbonate (HCO3)	5.1		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	4.2		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	3.99		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Free	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Ra-226	<0.0048		0.0048	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	0.393		0.010	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Mercury (Hg)-Total	0.00077		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	0.130		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.05		0.50	mg/L		11-SEP-18	R4214325
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00902		0.00030	mg/L		10-SEP-18	R4209029
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		10-SEP-18	R4209029
Arsenic (As)-Total	0.000216		0.000020	mg/L		10-SEP-18	R4209029
Barium (Ba)-Total	0.00609		0.000050	mg/L		10-SEP-18	R4209029
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Boron (B)-Total	0.0013		0.0010	mg/L		10-SEP-18	R4209029
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		10-SEP-18	R4209029
Chromium (Cr)-Total	0.000061		0.000060	mg/L		10-SEP-18	R4209029

* 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
L2147304-23 BRP-32-1							
Sampled By: CLIENT on 13-AUG-18 @ 08:45							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Cobalt (Co)-Total	0.000098		0.000010	mg/L		10-SEP-18	R4209029
Copper (Cu)-Total	0.00117		0.00010	mg/L		10-SEP-18	R4209029
Iron (Fe)-Total	0.0254		0.0010	mg/L		10-SEP-18	R4209029
Lead (Pb)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Lithium (Li)-Total	<0.00050		0.00050	mg/L		10-SEP-18	R4209029
Manganese (Mn)-Total	0.00237		0.000050	mg/L		10-SEP-18	R4209029
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Nickel (Ni)-Total	0.00297		0.000060	mg/L		10-SEP-18	R4209029
Selenium (Se)-Total	<0.000040		0.000040	mg/L		10-SEP-18	R4209029
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		10-SEP-18	R4209029
Strontium (Sr)-Total	0.0147		0.000050	mg/L		10-SEP-18	R4209029
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		10-SEP-18	R4209029
Tin (Sn)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		10-SEP-18	R4209029
Uranium (U)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Vanadium (V)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		10-SEP-18	R4209029
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175844
Mercury (Hg)-Dissolved	0.00064		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-24 BRP-32-2							
Sampled By: CLIENT on 13-AUG-18 @ 09:30							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202539
Dissolved Metals Filtration Location	LAB					07-SEP-18	R4204662
Aluminum (Al)-Dissolved	0.00492		0.00030	mg/L		08-SEP-18	R4205640
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		05-SEP-18	R4203962
Arsenic (As)-Dissolved	0.000220		0.000020	mg/L		05-SEP-18	R4203962
Barium (Ba)-Dissolved	0.00584		0.000050	mg/L		05-SEP-18	R4203962
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Boron (B)-Dissolved	0.0016		0.0010	mg/L		05-SEP-18	R4203962
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		05-SEP-18	R4203962
Calcium (Ca)-Dissolved	2.98		0.020	mg/L		05-SEP-18	R4203962
Chromium (Cr)-Dissolved	0.000087		0.000060	mg/L		05-SEP-18	R4203962
Cobalt (Co)-Dissolved	0.000024		0.000010	mg/L		05-SEP-18	R4203962
Copper (Cu)-Dissolved	0.00096		0.00010	mg/L		05-SEP-18	R4203962
Iron (Fe)-Dissolved	0.0018		0.0010	mg/L		05-SEP-18	R4203962
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Lithium (Li)-Dissolved	0.00113		0.00050	mg/L		05-SEP-18	R4203962
Magnesium (Mg)-Dissolved	1.93		0.0040	mg/L		05-SEP-18	R4203962
Manganese (Mn)-Dissolved	0.000065		0.000050	mg/L		05-SEP-18	R4203962
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962
Nickel (Ni)-Dissolved	0.00299		0.000060	mg/L		08-SEP-18	R4205640
Potassium (K)-Dissolved	0.382		0.020	mg/L		05-SEP-18	R4203962
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		05-SEP-18	R4203962
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		05-SEP-18	R4203962
Sodium (Na)-Dissolved	0.718		0.0050	mg/L		05-SEP-18	R4203962
Strontium (Sr)-Dissolved	0.0148		0.000050	mg/L		05-SEP-18	R4203962

* 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
L2147304-24 BRP-32-2							
Sampled By: CLIENT on 13-AUG-18 @ 09:30							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		05-SEP-18	R4203962
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		05-SEP-18	R4203962
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Vanadium (V)-Dissolved	0.000063		0.000050	mg/L		05-SEP-18	R4203962
Zinc (Zn)-Dissolved	0.00113		0.00080	mg/L		08-SEP-18	R4205640
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202539
Silicon (Si)-Dissolved	0.202		0.050	mg/L		05-SEP-18	R4203258
Sulfur (S)-Dissolved	2.90		0.50	mg/L		05-SEP-18	R4203258
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		05-SEP-18	R4203258
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.18		0.10	mg/L		10-SEP-18	R4209029
Sulfur (S)-Total	2.85		0.50	mg/L		10-SEP-18	R4209029
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		10-SEP-18	R4209029
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.180		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0033		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0056		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	2.34		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	4.5		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	15.4		0.053	mg/L		09-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	18.6			mg/L		10-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	7.64		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	39		10	mg/L		21-AUG-18	R4180280
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		20-AUG-18	R4179142
Turbidity							
Turbidity	0.48		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.74		0.10	pH		18-AUG-18	R4175983

* 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
L2147304-24 BRP-32-2							
Sampled By: CLIENT on 13-AUG-18 @ 09:30							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Conductivity (EC)	40.2		2.0	uS/cm		18-AUG-18	R4175983
Bicarbonate (HCO3)	5.2		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	4.3		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0010		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	3.94		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Free	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Ra-226	<0.0033		0.0033	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	0.384		0.010	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Mercury (Hg)-Total	0.00069		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	0.180		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.68		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00846		0.00030	mg/L		10-SEP-18	R4209029
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		10-SEP-18	R4209029
Arsenic (As)-Total	0.000215		0.000020	mg/L		10-SEP-18	R4209029
Barium (Ba)-Total	0.00578		0.000050	mg/L		10-SEP-18	R4209029
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Boron (B)-Total	0.0011		0.0010	mg/L		10-SEP-18	R4209029
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		10-SEP-18	R4209029
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		10-SEP-18	R4209029
Cobalt (Co)-Total	0.000095		0.000010	mg/L		10-SEP-18	R4209029
Copper (Cu)-Total	0.00117		0.00010	mg/L		10-SEP-18	R4209029
Iron (Fe)-Total	0.0251		0.0010	mg/L		10-SEP-18	R4209029
Lead (Pb)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Lithium (Li)-Total	<0.00050		0.00050	mg/L		10-SEP-18	R4209029
Manganese (Mn)-Total	0.00240		0.000050	mg/L		10-SEP-18	R4209029
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Nickel (Ni)-Total	0.00302		0.000060	mg/L		10-SEP-18	R4209029
Selenium (Se)-Total	<0.000040		0.000040	mg/L		10-SEP-18	R4209029
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		10-SEP-18	R4209029
Strontium (Sr)-Total	0.0148		0.000050	mg/L		10-SEP-18	R4209029
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		10-SEP-18	R4209029
Tin (Sn)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		10-SEP-18	R4209029
Uranium (U)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Vanadium (V)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		10-SEP-18	R4209029
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175844
Mercury (Hg)-Dissolved	0.00069		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-25 BRP-32-3							
Sampled By: CLIENT on 13-AUG-18 @ 10:10							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							

* 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
L2147304-25 BRP-32-3							
Sampled By: CLIENT on 13-AUG-18 @ 10:10							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202539
Dissolved Metals Filtration Location	LAB					07-SEP-18	R4204662
Aluminum (Al)-Dissolved	0.00543		0.00030	mg/L		08-SEP-18	R4205640
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		05-SEP-18	R4203962
Arsenic (As)-Dissolved	0.000208		0.000020	mg/L		05-SEP-18	R4203962
Barium (Ba)-Dissolved	0.00580		0.000050	mg/L		05-SEP-18	R4203962
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Boron (B)-Dissolved	0.0016		0.0010	mg/L		05-SEP-18	R4203962
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		12-SEP-18	R4215481
Calcium (Ca)-Dissolved	3.04		0.020	mg/L		05-SEP-18	R4203962
Chromium (Cr)-Dissolved	0.000082		0.000060	mg/L		05-SEP-18	R4203962
Cobalt (Co)-Dissolved	0.000023		0.000010	mg/L		05-SEP-18	R4203962
Copper (Cu)-Dissolved	0.00100		0.00010	mg/L		05-SEP-18	R4203962
Iron (Fe)-Dissolved	0.0018		0.0010	mg/L		05-SEP-18	R4203962
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Lithium (Li)-Dissolved	0.00113		0.00050	mg/L		05-SEP-18	R4203962
Magnesium (Mg)-Dissolved	1.91		0.0040	mg/L		05-SEP-18	R4203962
Manganese (Mn)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962
Nickel (Ni)-Dissolved	0.00307		0.000060	mg/L		08-SEP-18	R4205640
Potassium (K)-Dissolved	0.377		0.020	mg/L		05-SEP-18	R4203962
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		05-SEP-18	R4203962
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		05-SEP-18	R4203962
Sodium (Na)-Dissolved	0.706		0.0050	mg/L		05-SEP-18	R4203962
Strontium (Sr)-Dissolved	0.0149		0.000050	mg/L		05-SEP-18	R4203962
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		05-SEP-18	R4203962
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		05-SEP-18	R4203962
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Vanadium (V)-Dissolved	0.000059		0.000050	mg/L		05-SEP-18	R4203962
Zinc (Zn)-Dissolved	0.00092		0.00080	mg/L		08-SEP-18	R4205640
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202539
Silicon (Si)-Dissolved	0.185		0.050	mg/L		05-SEP-18	R4203258
Sulfur (S)-Dissolved	3.10		0.50	mg/L		05-SEP-18	R4203258
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		05-SEP-18	R4203258
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.17		0.10	mg/L		10-SEP-18	R4209029
Sulfur (S)-Total	2.85		0.50	mg/L		10-SEP-18	R4209029
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		10-SEP-18	R4209029
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.248		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0040		0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0077		0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							

* 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
L2147304-25 BRP-32-3							
Sampled By: CLIENT on 13-AUG-18 @ 10:10							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	2.33		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	5.0		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	15.4		0.053	mg/L		09-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	18.4			mg/L		10-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	7.64		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	36		10	mg/L		21-AUG-18	R4180280
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		20-AUG-18	R4179142
Turbidity							
Turbidity	0.43		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.71		0.10	pH		18-AUG-18	R4175983
Conductivity (EC)	40.5		2.0	uS/cm		18-AUG-18	R4175983
Bicarbonate (HCO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	4.0		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0030		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	4.33		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Free	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Ra-226	<0.0081		0.0081	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	0.397		0.010	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Mercury (Hg)-Total	0.00068		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	0.248		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.16		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00929		0.00030	mg/L		10-SEP-18	R4209029
Antimony (Sb)-Total	0.000024		0.000020	mg/L		10-SEP-18	R4209029
Arsenic (As)-Total	0.000222		0.000020	mg/L		10-SEP-18	R4209029
Barium (Ba)-Total	0.00590		0.000050	mg/L		10-SEP-18	R4209029
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Boron (B)-Total	0.0011		0.0010	mg/L		10-SEP-18	R4209029
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		10-SEP-18	R4209029
Chromium (Cr)-Total	0.000071		0.000060	mg/L		10-SEP-18	R4209029

* 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
L2147304-25 BRP-32-3							
Sampled By: CLIENT on 13-AUG-18 @ 10:10							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Cobalt (Co)-Total	0.000102		0.000010	mg/L		10-SEP-18	R4209029
Copper (Cu)-Total	0.00123		0.00010	mg/L		10-SEP-18	R4209029
Iron (Fe)-Total	0.0260		0.0010	mg/L		10-SEP-18	R4209029
Lead (Pb)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Lithium (Li)-Total	<0.00050		0.00050	mg/L		10-SEP-18	R4209029
Manganese (Mn)-Total	0.00252		0.000050	mg/L		10-SEP-18	R4209029
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Nickel (Ni)-Total	0.00304		0.000060	mg/L		10-SEP-18	R4209029
Selenium (Se)-Total	<0.000040		0.000040	mg/L		10-SEP-18	R4209029
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		10-SEP-18	R4209029
Strontium (Sr)-Total	0.0147		0.000050	mg/L		10-SEP-18	R4209029
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		10-SEP-18	R4209029
Tin (Sn)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Titanium (Ti)-Total	0.00011		0.00010	mg/L		10-SEP-18	R4209029
Uranium (U)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Vanadium (V)-Total	0.000054		0.000050	mg/L		10-SEP-18	R4209029
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		10-SEP-18	R4209029
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175844
Mercury (Hg)-Dissolved	0.00070		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650
L2147304-26 BRP-QC-2							
Sampled By: CLIENT on 13-AUG-18 @ 08:45							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202539
Dissolved Metals Filtration Location	LAB					07-SEP-18	R4204662
Aluminum (Al)-Dissolved	0.00558		0.00030	mg/L		08-SEP-18	R4205640
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		05-SEP-18	R4203962
Arsenic (As)-Dissolved	0.000212		0.000020	mg/L		05-SEP-18	R4203962
Barium (Ba)-Dissolved	0.00621		0.000050	mg/L		05-SEP-18	R4203962
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Boron (B)-Dissolved	0.0016		0.0010	mg/L		05-SEP-18	R4203962
Cadmium (Cd)-Dissolved	0.0000585		0.0000050	mg/L		12-SEP-18	R4215481
Calcium (Ca)-Dissolved	3.05		0.020	mg/L		05-SEP-18	R4203962
Chromium (Cr)-Dissolved	0.000086		0.000060	mg/L		05-SEP-18	R4203962
Cobalt (Co)-Dissolved	0.000018		0.000010	mg/L		05-SEP-18	R4203962
Copper (Cu)-Dissolved	0.00099		0.00010	mg/L		05-SEP-18	R4203962
Iron (Fe)-Dissolved	0.0018		0.0010	mg/L		05-SEP-18	R4203962
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Lithium (Li)-Dissolved	0.00107		0.00050	mg/L		05-SEP-18	R4203962
Magnesium (Mg)-Dissolved	1.91		0.0040	mg/L		05-SEP-18	R4203962
Manganese (Mn)-Dissolved	0.000081		0.000050	mg/L		05-SEP-18	R4203962
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962
Nickel (Ni)-Dissolved	0.00305		0.000060	mg/L		08-SEP-18	R4205640
Potassium (K)-Dissolved	0.370		0.020	mg/L		05-SEP-18	R4203962
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		05-SEP-18	R4203962
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		05-SEP-18	R4203962
Sodium (Na)-Dissolved	0.701		0.0050	mg/L		05-SEP-18	R4203962
Strontium (Sr)-Dissolved	0.0148		0.000050	mg/L		05-SEP-18	R4203962

* 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
L2147304-26 BRP-QC-2							
Sampled By: CLIENT on 13-AUG-18 @ 08:45							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		05-SEP-18	R4203962
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		05-SEP-18	R4203962
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		05-SEP-18	R4203962
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		05-SEP-18	R4203962
Vanadium (V)-Dissolved	0.000055		0.000050	mg/L		05-SEP-18	R4203962
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		05-SEP-18	R4203962
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					05-SEP-18	R4202539
Silicon (Si)-Dissolved	0.194		0.050	mg/L		05-SEP-18	R4203258
Sulfur (S)-Dissolved	2.58		0.50	mg/L		05-SEP-18	R4203258
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		05-SEP-18	R4203258
Total Metals in Water for Golder Cgy							
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.18		0.10	mg/L		10-SEP-18	R4209029
Sulfur (S)-Total	2.81		0.50	mg/L		10-SEP-18	R4209029
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		10-SEP-18	R4209029
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		27-AUG-18	R4185451
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.252		0.050	mg/L	31-AUG-18	04-SEP-18	R4199928
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0050	RRV	0.0010	mg/L		04-SEP-18	R4202069
Total P in Water by Colour							
Phosphorus (P)-Total	0.0045	RRV	0.0010	mg/L		04-SEP-18	R4202069
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	2.34		0.50	mg/L		17-AUG-18	R4175968
Color, True							
Color, True	4.9		2.0	C.U.		17-AUG-18	R4175456
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		17-AUG-18	R4175968
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	15.5		0.053	mg/L		09-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	18.6			mg/L		10-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		17-AUG-18	R4175968
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		17-AUG-18	R4175968
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	7.65		0.050	mg/L		17-AUG-18	R4175968
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		18-AUG-18	R4176227
Total Dissolved Solids							
Total Dissolved Solids	38		10	mg/L		21-AUG-18	R4180280
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		20-AUG-18	R4179142
Turbidity							
Turbidity	0.49		0.10	NTU		17-AUG-18	R4175602
pH, Conductivity and Total Alkalinity							
pH	6.77		0.10	pH		18-AUG-18	R4175983

* 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
L2147304-26 BRP-QC-2							
Sampled By: CLIENT on 13-AUG-18 @ 08:45							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Conductivity (EC)	40.4		2.0	uS/cm		18-AUG-18	R4175983
Bicarbonate (HCO3)	5.2		5.0	mg/L		18-AUG-18	R4175983
Carbonate (CO3)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Hydroxide (OH)	<5.0		5.0	mg/L		18-AUG-18	R4175983
Alkalinity, Total (as CaCO3)	4.3		2.0	mg/L		18-AUG-18	R4175983
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	0.0013		0.0010	mg/L		17-AUG-18	R4175701
Dissolved Organic Carbon	4.32		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Free	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Ra-226	<0.0081		0.0081	Bq/L	14-SEP-18	26-SEP-18	R4203163
Silicate (as SiO2)	0.383		0.010	mg/L		19-AUG-18	R4176401
Cyanide, Total	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Mercury (Hg)-Total	0.00063		0.00050	ug/L		22-AUG-18	R4180656
Total Nitrogen	0.252		0.050	mg/L		04-SEP-18	
Total Organic Carbon	4.45		0.50	mg/L		11-SEP-18	R4214062
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-AUG-18	R4180117
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00894		0.00030	mg/L		10-SEP-18	R4209029
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		10-SEP-18	R4209029
Arsenic (As)-Total	0.000230		0.000020	mg/L		10-SEP-18	R4209029
Barium (Ba)-Total	0.00601		0.000050	mg/L		10-SEP-18	R4209029
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Boron (B)-Total	0.0012		0.0010	mg/L		10-SEP-18	R4209029
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		10-SEP-18	R4209029
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		10-SEP-18	R4209029
Cobalt (Co)-Total	0.000095		0.000010	mg/L		10-SEP-18	R4209029
Copper (Cu)-Total	0.00126		0.00010	mg/L		10-SEP-18	R4209029
Iron (Fe)-Total	0.0263		0.0010	mg/L		10-SEP-18	R4209029
Lead (Pb)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Lithium (Li)-Total	0.00055		0.00050	mg/L		10-SEP-18	R4209029
Manganese (Mn)-Total	0.00236		0.000050	mg/L		10-SEP-18	R4209029
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Nickel (Ni)-Total	0.00307		0.000060	mg/L		10-SEP-18	R4209029
Selenium (Se)-Total	<0.000040		0.000040	mg/L		10-SEP-18	R4209029
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		10-SEP-18	R4209029
Strontium (Sr)-Total	0.0149		0.000050	mg/L		10-SEP-18	R4209029
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		10-SEP-18	R4209029
Tin (Sn)-Total	<0.000050		0.000050	mg/L		10-SEP-18	R4209029
Titanium (Ti)-Total	0.00014		0.00010	mg/L		10-SEP-18	R4209029
Uranium (U)-Total	<0.000010		0.000010	mg/L		10-SEP-18	R4209029
Vanadium (V)-Total	0.000052		0.000050	mg/L		10-SEP-18	R4209029
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		10-SEP-18	R4209029
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					18-AUG-18	R4175844
Mercury (Hg)-Dissolved	0.00064		0.00050	ug/L	18-AUG-18	22-AUG-18	R4180650

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
DLB	Detection Limit Raised. Analyte detected at comparable level in Method Blank.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-DIS-ORG-LOW-CL	Water	Dissolved Organic Carbon	APHA 5310 B-Instrumental

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.
TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 TOTAL ORGANIC CARBON (TOC)

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.
TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

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

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

CN-FREE-CFA-VA	Water	Free Cyanide in water by CFA	ASTM 7237

This analysis is carried out using procedures adapted from ASTM Method 7237 "Free Cyanide with Flow Injection Analysis (FIA) Utilizing Gas Diffusion Separation and Amperometric Detection". Free cyanide is determined by in-line gas diffusion at pH 6 with final determination by colourimetric analysis.

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

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

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

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

COL-TRU-ED	Water	Color, True	APHA 2120

True Colour is measured using a colorimeter by comparison to platinum-cobalt standards using the single wavelength method (450 - 465 nm) after filtration of sample through a 0.45 um filter. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Concurrent measurement of sample pH is recommended.

ETL-HARDNESS-DIS-ED	Water	Hardness (from Dissolved Ca and Mg)	APHA 2340 B-Calculation
F-IC-N-ED	Water	Fluoride in Water by IC	EPA 300.1 (mod)

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

HG-D-U-CVAF-VA	Water	Diss. Mercury in Water by CVAFS (Ultra)	APHA 3030 B / EPA 1631 REV. E

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency (EPA). The procedure may involve preliminary sample treatment by filtration (APHA 3030B) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

cold vapour atomic fluorescence spectrophotometry.

HG-T-U-CVAF-VA	Water	Total Mercury in Water by CVAFS (Ultra)	EPA 1631 REV. E

This analysis is carried out using procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry.

IONBALANCE-ED	Water	Ion Balance Calculation	APHA 1030E
MET-D-CCMS-ED	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)

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

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

MET-D-NP-U-CCMS-ED	Water	Diss. Metals in Water by CRC ICPMS (Ult)	APHA 3125-ICP-MS

Ultra trace metals in water are analyzed by ICPMS, based on US EPA Method 6020A (Jan 1998). This procedure is intended for pristine field-filtered acid-preserved water samples. ALS recommends that filtration blanks be submitted for this test to aid with interpretation of results.

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

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

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

MET-T-NP-U-CCMS-ED	Water	Metals in Water by CRC ICPMS (No Digest)	APHA 3125-ICP-MS

Ultra trace metals in water are analyzed by ICPMS, based on US EPA Method 6020A (Jan 1998). The detection limits provided can only be met for undigested samples. This procedure is intended for pristine, non-turbid, acid-preserved water samples, where sample turbidity is < 1 NTU. Where turbidity exceeds 1 NTU, results may be biased low compared to true Total Metals concentrations. ALS recommends that turbidity analysis be requested on samples submitted for this test to aid with interpretation of results.

N-T-CALC-ED	Water	Total Nitrogen (Calculation)	APHA 4500 N-Calculated

Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)]

NH3-L-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.

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

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

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

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

P-T-L-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

P-TD-L-COL-ED	Water	Total Dissolved P in Water by Colour	APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Dissolved Phosphorous is determined colourimetrically after persulphate digestion of a sample that has been lab or field filtered through a 0.45 micron membrane filter.

PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320

All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed).
pH measurement is determined from the activity of the hydrogen ions using a hydrogen electrode and a reference electrode.
Alkalinity measurement is based on the sample's capacity to neutralize acid. Auto-titration to pH 4.5 using 0.02N H2SO4 is performed.
Conductivity measurement is based on the sample's capacity to convey an electric current, and is measured with a conductivity meter.

PO4-DO-L-COL-ED	Water	Diss. Orthophosphate in Water 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.

RA226-MMER-FC	Water	Ra226 by Alpha Scint, MDC=0.01 Bq/L	EPA 903.1
SILICATE-COL-ED	Water	Reactive Silica by Colour	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.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
SILICATE-L-COL-ED	Water	Reactive Silica by Colour	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.			
SO4-L-IC-N-ED	Water	Sulfate in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
SOLIDS-TDS-ED	Water	Total Dissolved Solids	APHA 2540 C
Gravimetric determination of solids in waters by filtration and evaporating filtrate to dryness at 180 degrees Celsius.			
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.			
SULPHIDE-CFA-ED	Water	Sulphide	APHA 4500 -S E-Auto-Colorimetry
A continuous flow manifold adds HCl to the sample which converts sulphide to a gas, then the sulphide is separated from the flow using a gas dialysis membrane. A colorimetric reaction produces a methylene blue compound which is measured at 660 nm. This follows the Standard Methods procedure 4500 S-E.			
TKN-L-CFA-ED	Water	TKN in Water by Colour	APHA 4500-NORG (TKN)
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 celcius with analysis using an automated colourimetric finish.			
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer
This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.			

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

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

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA
FC	ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA

Chain of Custody Numbers:

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: GOLDER ASSOCIATES LTD
16820 107 Ave NW
EDMONTON AB T5P 4C3
Contact: Zenovia Craciunescu / Kerrie Serbin

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-DIS-ORG-LOW-CL	**Water**							
Batch R4214062								
WG2874366-2 LCS								
Dissolved Organic Carbon			98.9		%		80-120	11-SEP-18
WG2874366-1 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	11-SEP-18
Batch R4214325								
WG2874686-3 DUP		**L2147304-19**						
Dissolved Organic Carbon		4.81	4.88		mg/L	1.5	20	11-SEP-18
WG2874686-2 LCS								
Dissolved Organic Carbon			100.2		%		80-120	11-SEP-18
WG2874686-1 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	12-SEP-18
WG2874686-4 MS		**L2147304-20**						
Dissolved Organic Carbon			120.9		%		70-130	11-SEP-18
C-TOT-ORG-LOW-CL	**Water**							
Batch R4214062								
WG2874366-2 LCS								
Total Organic Carbon			105.8		%		80-120	11-SEP-18
WG2874366-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	11-SEP-18
Batch R4214325								
WG2874686-3 DUP		**L2147304-19**						
Total Organic Carbon		4.83	4.23		mg/L	13	20	11-SEP-18
WG2874686-2 LCS								
Total Organic Carbon			105.2		%		80-120	11-SEP-18
WG2874686-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	11-SEP-18
WG2874686-4 MS		**L2147304-20**						
Total Organic Carbon			123.1		%		70-130	11-SEP-18
CL-IC-N-ED	**Water**							
Batch R4175968								
WG2852554-5 DUP		**L2147304-18**						
Chloride (Cl)		3.86	3.90		mg/L	0.9	20	17-AUG-18
WG2852554-11 LCS								
Chloride (Cl)			102.8		%		90-110	17-AUG-18
WG2852554-13 LCS								
Chloride (Cl)			102.2		%		90-110	17-AUG-18
WG2852554-15 LCS								
Chloride (Cl)			102.2		%		90-110	17-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-IC-N-ED	**Water**							
Batch R4175968								
WG2852554-17 LCS								
Chloride (Cl)			102.3		%		90-110	17-AUG-18
WG2852554-2 LCS								
Chloride (Cl)			106.2		%		90-110	17-AUG-18
WG2852554-1 MB								
Chloride (Cl)			<0.50		mg/L		0.5	17-AUG-18
WG2852554-12 MB								
Chloride (Cl)			<0.50		mg/L		0.5	17-AUG-18
WG2852554-14 MB								
Chloride (Cl)			<0.50		mg/L		0.5	17-AUG-18
WG2852554-16 MB								
Chloride (Cl)			<0.50		mg/L		0.5	17-AUG-18
WG2852554-18 MB								
Chloride (Cl)			<0.50		mg/L		0.5	17-AUG-18
WG2852554-6 MS		**L2147304-18**						
Chloride (Cl)			106.0		%		75-125	17-AUG-18
CN-FREE-CFA-VA	**Water**							
Batch R4176144								
WG2853425-7 LCS								
Cyanide, Free			98.6		%		80-120	18-AUG-18
WG2853425-6 MB								
Cyanide, Free			<0.0050		mg/L		0.005	18-AUG-18
Batch R4180117								
WG2855239-10 DUP		**L2147304-20**						
Cyanide, Free		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	21-AUG-18
WG2855239-12 LCS								
Cyanide, Free			98.7		%		80-120	21-AUG-18
WG2855239-17 LCS								
Cyanide, Free			98.4		%		80-120	21-AUG-18
WG2855239-2 LCS								
Cyanide, Free			96.6		%		80-120	21-AUG-18
WG2855239-7 LCS								
Cyanide, Free			97.6		%		80-120	21-AUG-18
WG2855239-1 MB								
Cyanide, Free			<0.0050		mg/L		0.005	21-AUG-18
WG2855239-11 MB								
Cyanide, Free			<0.0050		mg/L		0.005	21-AUG-18
WG2855239-16 MB								

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Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-FREE-CFA-VA	**Water**							
Batch R4180117								
WG2855239-16 MB								
Cyanide, Free			<0.0050		mg/L		0.005	21-AUG-18
WG2855239-6 MB								
Cyanide, Free			<0.0050		mg/L		0.005	21-AUG-18
WG2855239-9 MS		**L2147304-20**						
Cyanide, Free			97.1		%		75-125	21-AUG-18
CN-T-CFA-VA	**Water**							
Batch R4176144								
WG2853425-7 LCS								
Cyanide, Total			95.7		%		80-120	18-AUG-18
WG2853425-6 MB								
Cyanide, Total			<0.0050		mg/L		0.005	18-AUG-18
Batch R4180117								
WG2855239-10 DUP		**L2147304-20**						
Cyanide, Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	21-AUG-18
WG2855239-12 LCS								
Cyanide, Total			97.4		%		80-120	21-AUG-18
WG2855239-17 LCS								
Cyanide, Total			96.9		%		80-120	21-AUG-18
WG2855239-2 LCS								
Cyanide, Total			96.3		%		80-120	21-AUG-18
WG2855239-7 LCS								
Cyanide, Total			96.4		%		80-120	21-AUG-18
WG2855239-1 MB								
Cyanide, Total			<0.0050		mg/L		0.005	21-AUG-18
WG2855239-11 MB								
Cyanide, Total			<0.0050		mg/L		0.005	21-AUG-18
WG2855239-16 MB								
Cyanide, Total			<0.0050		mg/L		0.005	21-AUG-18
WG2855239-6 MB								
Cyanide, Total			<0.0050		mg/L		0.005	21-AUG-18
WG2855239-9 MS		**L2147304-20**						
Cyanide, Total			94.8		%		75-125	21-AUG-18
CN-WAD-CFA-VA	**Water**							
Batch R4176144								
WG2853425-7 LCS								
Cyanide, Weak Acid Diss			96.7		%		80-120	18-AUG-18
WG2853425-6 MB								

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Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-WAD-CFA-VA	**Water**							
Batch R4176144								
WG2853425-6 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	18-AUG-18
Batch R4180117								
WG2855239-10 DUP		**L2147304-20**						
Cyanide, Weak Acid Diss		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	21-AUG-18
WG2855239-12 LCS								
Cyanide, Weak Acid Diss			97.2		%		80-120	21-AUG-18
WG2855239-17 LCS								
Cyanide, Weak Acid Diss			97.7		%		80-120	21-AUG-18
WG2855239-2 LCS								
Cyanide, Weak Acid Diss			99.2		%		80-120	21-AUG-18
WG2855239-7 LCS								
Cyanide, Weak Acid Diss			96.4		%		80-120	21-AUG-18
WG2855239-1 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	21-AUG-18
WG2855239-11 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	21-AUG-18
WG2855239-16 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	21-AUG-18
WG2855239-6 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	21-AUG-18
WG2855239-9 MS		**L2147304-20**						
Cyanide, Weak Acid Diss			96.7		%		75-125	21-AUG-18
COL-TRU-ED	**Water**							
Batch R4175456								
WG2852747-3 DUP		**L2147304-8**						
Color, True		51.1	51.3		C.U.	0.3	20	17-AUG-18
WG2852747-6 DUP		**L2147304-26**						
Color, True		4.9	4.5		C.U.	8.3	20	17-AUG-18
WG2852747-2 LCS								
Color, True			98.2		%		85-115	17-AUG-18
WG2852747-5 LCS								
Color, True			100.0		%		85-115	17-AUG-18
WG2852747-1 MB								
Color, True			<2.0		C.U.		2	17-AUG-18
WG2852747-4 MB								
Color, True			<2.0		C.U.		2	17-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-ED	**Water**							
Batch R4175968								
WG2852554-5 DUP		**L2147304-18**						
Fluoride (F)		<0.020	<0.020	RPD-NA	mg/L	N/A	20	17-AUG-18
WG2852554-11 LCS								
Fluoride (F)			100.2		%		90-110	17-AUG-18
WG2852554-13 LCS								
Fluoride (F)			99.1		%		90-110	17-AUG-18
WG2852554-15 LCS								
Fluoride (F)			101.7		%		90-110	17-AUG-18
WG2852554-17 LCS								
Fluoride (F)			97.0		%		90-110	17-AUG-18
WG2852554-2 LCS								
Fluoride (F)			96.4		%		90-110	17-AUG-18
WG2852554-1 MB								
Fluoride (F)			<0.020		mg/L		0.02	17-AUG-18
WG2852554-12 MB								
Fluoride (F)			<0.020		mg/L		0.02	17-AUG-18
WG2852554-14 MB								
Fluoride (F)			<0.020		mg/L		0.02	17-AUG-18
WG2852554-16 MB								
Fluoride (F)			<0.020		mg/L		0.02	17-AUG-18
WG2852554-18 MB								
Fluoride (F)			<0.020		mg/L		0.02	17-AUG-18
WG2852554-6 MS		**L2147304-18**						
Fluoride (F)			98.6		%		75-125	17-AUG-18
HG-D-U-CVAF-VA	**Water**							
Batch R4180650								
WG2853293-3 DUP		**L2147304-17**						
Mercury (Hg)-Dissolved		0.00080	0.00078		ug/L	1.7	20	22-AUG-18
WG2853298-3 DUP		**L2147304-22**						
Mercury (Hg)-Dissolved		<0.00050	<0.00050	RPD-NA	ug/L	N/A	20	22-AUG-18
WG2853293-2 LCS								
Mercury (Hg)-Dissolved			107.5		%		80-120	22-AUG-18
WG2853298-2 LCS								
Mercury (Hg)-Dissolved			107.5		%		80-120	22-AUG-18
WG2856625-2 LCS								
Mercury (Hg)-Dissolved			107.5		%		80-120	22-AUG-18
WG2853293-1 MB		**NP**						
Mercury (Hg)-Dissolved			<0.00050		ug/L		0.0005	22-AUG-18
WG2853298-1 MB		**NP**						

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-D-U-CVAF-VA	**Water**							
Batch R4180650								
WG2853298-1 MB		**NP**						
Mercury (Hg)-Dissolved			<0.00050		ug/L		0.0005	22-AUG-18
WG2856625-1 MB								
Mercury (Hg)-Dissolved			<0.00050		ug/L		0.0005	22-AUG-18
WG2853293-4 MS		**L2147304-16**						
Mercury (Hg)-Dissolved			92.7		%		70-130	22-AUG-18
WG2853298-4 MS		**L2147304-21**						
Mercury (Hg)-Dissolved			93.1		%		70-130	22-AUG-18
HG-T-U-CVAF-VA	**Water**							
Batch R4179640								
WG2855480-3 DUP		**L2147304-7**						
Mercury (Hg)-Total		0.00095	0.00099		ug/L	3.7	20	21-AUG-18
WG2855480-2 LCS								
Mercury (Hg)-Total			103.0		%		80-120	21-AUG-18
WG2855480-1 MB								
Mercury (Hg)-Total			<0.00050		ug/L		0.0005	21-AUG-18
Batch R4180656								
WG2856861-2 LCS								
Mercury (Hg)-Total			113.2		%		80-120	22-AUG-18
WG2856861-1 MB								
Mercury (Hg)-Total			<0.00050		ug/L		0.0005	22-AUG-18
WG2856861-4 MS		**L2147304-11**						
Mercury (Hg)-Total			93.1		%		70-130	22-AUG-18
MET-D-CCMS-ED	**Water**							
Batch R4203258								
WG2868399-3 DUP		**L2147304-26**						
Silicon (Si)-Dissolved		0.194	0.194		mg/L	0.3	20	05-SEP-18
Sulfur (S)-Dissolved		2.58	2.94		mg/L	13	20	05-SEP-18
Zirconium (Zr)-Dissolved		<0.000060	<0.000060	RPD-NA	mg/L	N/A	20	05-SEP-18
WG2868399-2 LCS								
Silicon (Si)-Dissolved			104.6		%		80-120	05-SEP-18
Sulfur (S)-Dissolved			103.0		%		80-120	05-SEP-18
Zirconium (Zr)-Dissolved			100.7		%		80-120	05-SEP-18
WG2868399-1 MB								
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	05-SEP-18
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	05-SEP-18
Zirconium (Zr)-Dissolved			<0.000060		mg/L		0.00006	05-SEP-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-ED	**Water**							
Batch R4204206								
WG2868258-3 DUP		**L2147304-20**						
Silicon (Si)-Dissolved		0.179	0.191		mg/L	6.5	20	06-SEP-18
Sulfur (S)-Dissolved		3.35	3.16		mg/L	6.0	20	06-SEP-18
Zirconium (Zr)-Dissolved		<0.000060	<0.000060	RPD-NA	mg/L	N/A	20	06-SEP-18
WG2868258-2 LCS								
Silicon (Si)-Dissolved			99.8		%		80-120	06-SEP-18
Sulfur (S)-Dissolved			111.1		%		80-120	06-SEP-18
Zirconium (Zr)-Dissolved			110.6		%		80-120	06-SEP-18
WG2868258-1 MB								
Silicon (Si)-Dissolved			<0.050		mg/L		0.05	06-SEP-18
Sulfur (S)-Dissolved			<0.50		mg/L		0.5	06-SEP-18
Zirconium (Zr)-Dissolved			<0.000060		mg/L		0.00006	06-SEP-18
WG2868258-4 MS		**L2147304-20**						
Silicon (Si)-Dissolved			113.7		%		70-130	06-SEP-18
Sulfur (S)-Dissolved			101.7		%		70-130	06-SEP-18
Zirconium (Zr)-Dissolved			122.4		%		70-130	06-SEP-18
MET-D-NP-U-CCMS-ED	**Water**							
Batch R4203962								
WG2868399-2 LCS								
Aluminum (Al)-Dissolved			110.1		%		80-120	05-SEP-18
Antimony (Sb)-Dissolved			100.8		%		80-120	05-SEP-18
Arsenic (As)-Dissolved			105.2		%		80-120	05-SEP-18
Barium (Ba)-Dissolved			108.2		%		80-120	05-SEP-18
Beryllium (Be)-Dissolved			101.7		%		80-120	05-SEP-18
Bismuth (Bi)-Dissolved			103.1		%		80-120	05-SEP-18
Boron (B)-Dissolved			97.5		%		80-120	05-SEP-18
Cadmium (Cd)-Dissolved			102.7		%		80-120	05-SEP-18
Calcium (Ca)-Dissolved			102.5		%		80-120	05-SEP-18
Chromium (Cr)-Dissolved			105.8		%		80-120	05-SEP-18
Cobalt (Co)-Dissolved			102.6		%		80-120	05-SEP-18
Copper (Cu)-Dissolved			102.6		%		80-120	05-SEP-18
Iron (Fe)-Dissolved			106.2		%		80-120	05-SEP-18
Lead (Pb)-Dissolved			102.2		%		80-120	05-SEP-18
Lithium (Li)-Dissolved			98.7		%		80-120	05-SEP-18
Magnesium (Mg)-Dissolved			107.2		%		80-120	05-SEP-18
Manganese (Mn)-Dissolved			100.4		%		80-120	05-SEP-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch	**R4203962**							
WG2868399-2	**LCS**							
Molybdenum (Mo)-Dissolved			101.0		%		80-120	05-SEP-18
Nickel (Ni)-Dissolved			103.2		%		80-120	05-SEP-18
Potassium (K)-Dissolved			105.4		%		80-120	05-SEP-18
Selenium (Se)-Dissolved			109.7		%		80-120	05-SEP-18
Silver (Ag)-Dissolved			101.8		%		80-120	05-SEP-18
Sodium (Na)-Dissolved			101.9		%		80-120	05-SEP-18
Strontium (Sr)-Dissolved			99.6		%		80-120	05-SEP-18
Thallium (Tl)-Dissolved			102.2		%		80-120	05-SEP-18
Tin (Sn)-Dissolved			101.2		%		80-120	05-SEP-18
Titanium (Ti)-Dissolved			101.4		%		80-120	05-SEP-18
Uranium (U)-Dissolved			99.7		%		80-120	05-SEP-18
Vanadium (V)-Dissolved			104.6		%		80-120	05-SEP-18
Zinc (Zn)-Dissolved			108.0		%		80-120	05-SEP-18
WG2868399-1	**MB**							
Aluminum (Al)-Dissolved			0.00053	B	mg/L		0.0003	05-SEP-18
Antimony (Sb)-Dissolved			<0.000020		mg/L		0.00002	05-SEP-18
Arsenic (As)-Dissolved			<0.000020		mg/L		0.00002	05-SEP-18
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	05-SEP-18
Beryllium (Be)-Dissolved			<0.000010		mg/L		0.00001	05-SEP-18
Bismuth (Bi)-Dissolved			<0.000010		mg/L		0.00001	05-SEP-18
Boron (B)-Dissolved			<0.0010		mg/L		0.001	05-SEP-18
Cadmium (Cd)-Dissolved			0.0000071	B	mg/L		0.000005	05-SEP-18
Calcium (Ca)-Dissolved			<0.020		mg/L		0.02	05-SEP-18
Chromium (Cr)-Dissolved			<0.000060		mg/L		0.00006	05-SEP-18
Cobalt (Co)-Dissolved			<0.000010		mg/L		0.00001	05-SEP-18
Copper (Cu)-Dissolved			<0.00010		mg/L		0.0001	05-SEP-18
Iron (Fe)-Dissolved			<0.0010		mg/L		0.001	05-SEP-18
Lead (Pb)-Dissolved			0.000011	B	mg/L		0.00001	05-SEP-18
Lithium (Li)-Dissolved			<0.00050		mg/L		0.0005	05-SEP-18
Magnesium (Mg)-Dissolved			<0.0040		mg/L		0.004	05-SEP-18
Manganese (Mn)-Dissolved			<0.000050		mg/L		0.00005	05-SEP-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	05-SEP-18
Nickel (Ni)-Dissolved			0.000079	B	mg/L		0.00006	05-SEP-18
Potassium (K)-Dissolved			<0.020		mg/L		0.02	05-SEP-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch R4203962								
WG2868399-1 MB								
Selenium (Se)-Dissolved			<0.000040		mg/L		0.00004	05-SEP-18
Silver (Ag)-Dissolved			<0.000005(		mg/L		0.000005	05-SEP-18
Sodium (Na)-Dissolved			<0.0050		mg/L		0.005	05-SEP-18
Strontium (Sr)-Dissolved			<0.000050		mg/L		0.00005	05-SEP-18
Thallium (Tl)-Dissolved			<0.000005(		mg/L		0.000005	05-SEP-18
Tin (Sn)-Dissolved			<0.000050		mg/L		0.00005	05-SEP-18
Titanium (Ti)-Dissolved			<0.00010		mg/L		0.0001	05-SEP-18
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	05-SEP-18
Vanadium (V)-Dissolved			<0.000050		mg/L		0.00005	05-SEP-18
Zinc (Zn)-Dissolved			0.00080	B	mg/L		0.0008	05-SEP-18
Batch R4204206								
WG2868258-3 DUP		**L2147304-20**						
Antimony (Sb)-Dissolved		<0.000020	<0.000020	RPD-NA	mg/L	N/A	20	06-SEP-18
Arsenic (As)-Dissolved		0.000202	0.000219		mg/L	8.1	20	06-SEP-18
Barium (Ba)-Dissolved		0.00531	0.00560		mg/L	5.3	20	06-SEP-18
Beryllium (Be)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	06-SEP-18
Bismuth (Bi)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	06-SEP-18
Boron (B)-Dissolved		0.0012	0.0010		mg/L	17	20	06-SEP-18
Cadmium (Cd)-Dissolved		0.0000061	0.0000059		mg/L	2.3	20	06-SEP-18
Calcium (Ca)-Dissolved		2.95	3.12		mg/L	5.5	20	06-SEP-18
Chromium (Cr)-Dissolved		<0.000060	0.000065	RPD-NA	mg/L	N/A	20	06-SEP-18
Cobalt (Co)-Dissolved		0.000025	0.000021		mg/L	17	20	06-SEP-18
Copper (Cu)-Dissolved		0.00100	0.00099		mg/L	0.8	20	06-SEP-18
Iron (Fe)-Dissolved		0.0020	0.0018		mg/L	12	20	06-SEP-18
Lead (Pb)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	06-SEP-18
Lithium (Li)-Dissolved		0.00091	0.00083		mg/L	8.2	20	06-SEP-18
Magnesium (Mg)-Dissolved		1.92	1.98		mg/L	3.1	20	06-SEP-18
Manganese (Mn)-Dissolved		0.000097	0.000067	J	mg/L	0.000031	0.0001	06-SEP-18
Molybdenum (Mo)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	06-SEP-18
Nickel (Ni)-Dissolved		0.00285	0.00296		mg/L	3.8	20	06-SEP-18
Potassium (K)-Dissolved		0.382	0.391		mg/L	2.2	20	06-SEP-18
Selenium (Se)-Dissolved		<0.000040	<0.000040	RPD-NA	mg/L	N/A	20	06-SEP-18
Silver (Ag)-Dissolved		<0.0000050	<0.000005(	RPD-NA	mg/L	N/A	20	06-SEP-18
Sodium (Na)-Dissolved		0.697	0.705		mg/L	1.2	20	06-SEP-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch R4204206								
WG2868258-3 DUP		**L2147304-20**						
Strontium (Sr)-Dissolved		0.0141	0.0147		mg/L	3.9	20	06-SEP-18
Thallium (Tl)-Dissolved		<0.0000050	<0.000005(	RPD-NA	mg/L	N/A	20	06-SEP-18
Tin (Sn)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	06-SEP-18
Titanium (Ti)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	06-SEP-18
Uranium (U)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	06-SEP-18
Vanadium (V)-Dissolved		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	06-SEP-18
Zinc (Zn)-Dissolved		<0.00080	<0.00080	RPD-NA	mg/L	N/A	20	06-SEP-18
WG2868258-2 LCS								
Aluminum (Al)-Dissolved			105.0		%		80-120	06-SEP-18
Antimony (Sb)-Dissolved			97.3		%		80-120	06-SEP-18
Arsenic (As)-Dissolved			102.8		%		80-120	06-SEP-18
Barium (Ba)-Dissolved			102.9		%		80-120	06-SEP-18
Beryllium (Be)-Dissolved			101.0		%		80-120	06-SEP-18
Bismuth (Bi)-Dissolved			99.99		%		80-120	06-SEP-18
Boron (B)-Dissolved			101.5		%		80-120	06-SEP-18
Cadmium (Cd)-Dissolved			102.4		%		80-120	06-SEP-18
Calcium (Ca)-Dissolved			100.2		%		80-120	06-SEP-18
Chromium (Cr)-Dissolved			104.1		%		80-120	06-SEP-18
Cobalt (Co)-Dissolved			101.4		%		80-120	06-SEP-18
Copper (Cu)-Dissolved			100.1		%		80-120	06-SEP-18
Iron (Fe)-Dissolved			99.3		%		80-120	06-SEP-18
Lead (Pb)-Dissolved			101.5		%		80-120	06-SEP-18
Lithium (Li)-Dissolved			98.5		%		80-120	06-SEP-18
Magnesium (Mg)-Dissolved			104.6		%		80-120	06-SEP-18
Manganese (Mn)-Dissolved			105.2		%		80-120	06-SEP-18
Molybdenum (Mo)-Dissolved			99.1		%		80-120	06-SEP-18
Nickel (Ni)-Dissolved			102.0		%		80-120	06-SEP-18
Potassium (K)-Dissolved			104.4		%		80-120	06-SEP-18
Selenium (Se)-Dissolved			99.1		%		80-120	06-SEP-18
Silver (Ag)-Dissolved			100.2		%		80-120	06-SEP-18
Sodium (Na)-Dissolved			103.7		%		80-120	06-SEP-18
Strontium (Sr)-Dissolved			100.1		%		80-120	06-SEP-18
Thallium (Tl)-Dissolved			102.8		%		80-120	06-SEP-18
Tin (Sn)-Dissolved			99.0		%		80-120	06-SEP-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch	**R4204206**							
WG2868258-2	**LCS**							
Titanium (Ti)-Dissolved			98.8		%		80-120	06-SEP-18
Uranium (U)-Dissolved			101.2		%		80-120	06-SEP-18
Vanadium (V)-Dissolved			105.2		%		80-120	06-SEP-18
Zinc (Zn)-Dissolved			98.3		%		80-120	06-SEP-18
WG2868258-1	**MB**							
Aluminum (Al)-Dissolved			<0.00030		mg/L		0.0003	06-SEP-18
Antimony (Sb)-Dissolved			<0.000020		mg/L		0.00002	06-SEP-18
Arsenic (As)-Dissolved			<0.000020		mg/L		0.00002	06-SEP-18
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	06-SEP-18
Beryllium (Be)-Dissolved			<0.000010		mg/L		0.00001	06-SEP-18
Bismuth (Bi)-Dissolved			<0.000010		mg/L		0.00001	06-SEP-18
Boron (B)-Dissolved			<0.0010		mg/L		0.001	06-SEP-18
Cadmium (Cd)-Dissolved			<0.000005(		mg/L		0.000005	06-SEP-18
Calcium (Ca)-Dissolved			<0.020		mg/L		0.02	06-SEP-18
Chromium (Cr)-Dissolved			<0.000060		mg/L		0.00006	06-SEP-18
Cobalt (Co)-Dissolved			<0.000010		mg/L		0.00001	06-SEP-18
Copper (Cu)-Dissolved			<0.00010		mg/L		0.0001	06-SEP-18
Iron (Fe)-Dissolved			<0.0010		mg/L		0.001	06-SEP-18
Lead (Pb)-Dissolved			<0.000010		mg/L		0.00001	06-SEP-18
Lithium (Li)-Dissolved			<0.00050		mg/L		0.0005	06-SEP-18
Magnesium (Mg)-Dissolved			<0.0040		mg/L		0.004	06-SEP-18
Manganese (Mn)-Dissolved			<0.000050		mg/L		0.00005	06-SEP-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	06-SEP-18
Nickel (Ni)-Dissolved			<0.000060		mg/L		0.00006	06-SEP-18
Potassium (K)-Dissolved			<0.020		mg/L		0.02	06-SEP-18
Selenium (Se)-Dissolved			<0.000040		mg/L		0.00004	06-SEP-18
Silver (Ag)-Dissolved			<0.000005(		mg/L		0.000005	06-SEP-18
Sodium (Na)-Dissolved			0.0260	MB-LOR	mg/L		0.005	06-SEP-18
Strontium (Sr)-Dissolved			<0.000050		mg/L		0.00005	06-SEP-18
Thallium (Tl)-Dissolved			<0.000005(		mg/L		0.000005	06-SEP-18
Tin (Sn)-Dissolved			<0.000050	B	mg/L		0.00005	06-SEP-18
Titanium (Ti)-Dissolved			<0.00010		mg/L		0.0001	06-SEP-18
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	06-SEP-18
Vanadium (V)-Dissolved			<0.000050		mg/L		0.00005	06-SEP-18

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Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch R4204206								
WG2868258-1 MB								
Zinc (Zn)-Dissolved			0.00085	MB-LOR	mg/L		0.0008	06-SEP-18
WG2868258-4 MS		**L2147304-20**						
Aluminum (Al)-Dissolved			111.2		%		70-130	06-SEP-18
Antimony (Sb)-Dissolved			124.2		%		70-130	06-SEP-18
Arsenic (As)-Dissolved			107.1		%		70-130	06-SEP-18
Barium (Ba)-Dissolved			104.8		%		70-130	06-SEP-18
Beryllium (Be)-Dissolved			105.9		%		70-130	06-SEP-18
Bismuth (Bi)-Dissolved			97.7		%		70-130	06-SEP-18
Boron (B)-Dissolved			122.6		%		70-130	06-SEP-18
Cadmium (Cd)-Dissolved			108.2		%		70-130	06-SEP-18
Calcium (Ca)-Dissolved			104.5		%		70-130	06-SEP-18
Chromium (Cr)-Dissolved			108.0		%		70-130	06-SEP-18
Cobalt (Co)-Dissolved			106.9		%		70-130	06-SEP-18
Copper (Cu)-Dissolved			107.2		%		70-130	06-SEP-18
Iron (Fe)-Dissolved			104.1		%		70-130	06-SEP-18
Lead (Pb)-Dissolved			102.8		%		70-130	06-SEP-18
Lithium (Li)-Dissolved			100.6		%		70-130	06-SEP-18
Magnesium (Mg)-Dissolved			N/A	MS-B	%		-	06-SEP-18
Manganese (Mn)-Dissolved			108.7		%		70-130	06-SEP-18
Molybdenum (Mo)-Dissolved			119.9		%		70-130	06-SEP-18
Nickel (Ni)-Dissolved			107.9		%		70-130	06-SEP-18
Potassium (K)-Dissolved			107.0		%		70-130	06-SEP-18
Selenium (Se)-Dissolved			104.7		%		70-130	06-SEP-18
Silver (Ag)-Dissolved			116.8		%		70-130	06-SEP-18
Sodium (Na)-Dissolved			105.0		%		70-130	06-SEP-18
Strontium (Sr)-Dissolved			104.9		%		70-130	06-SEP-18
Thallium (Tl)-Dissolved			105.6		%		70-130	06-SEP-18
Tin (Sn)-Dissolved			120.0		%		70-130	06-SEP-18
Titanium (Ti)-Dissolved			123.2		%		70-130	06-SEP-18
Uranium (U)-Dissolved			105.9		%		70-130	06-SEP-18
Vanadium (V)-Dissolved			106.6		%		70-130	06-SEP-18
Zinc (Zn)-Dissolved			105.4		%		70-130	06-SEP-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch	**R4205640**							
WG2870449-3	**DUP**	**L2147304-21**						
Aluminum (Al)-Dissolved		0.00927	0.00903		mg/L	2.6	20	08-SEP-18
Antimony (Sb)-Dissolved		<0.000020	0.000132		mg/L	0.9	20	08-SEP-18
Arsenic (As)-Dissolved		0.000262	0.000330		mg/L	6.6	20	08-SEP-18
Barium (Ba)-Dissolved		0.00704	0.00730		mg/L	1.0	20	08-SEP-18
Beryllium (Be)-Dissolved		<0.000010	0.000046		mg/L	2.9	20	08-SEP-18
Bismuth (Bi)-Dissolved		<0.000010	0.000012		mg/L	18	20	08-SEP-18
Boron (B)-Dissolved		0.0020	0.0027		mg/L	14	20	08-SEP-18
Calcium (Ca)-Dissolved		3.79	3.85		mg/L	0.7	20	08-SEP-18
Chromium (Cr)-Dissolved		0.000082	0.000234		mg/L	8.9	20	08-SEP-18
Cobalt (Co)-Dissolved		0.000025	0.000053		mg/L	0.9	20	08-SEP-18
Copper (Cu)-Dissolved		0.00120	0.00144		mg/L	0.3	20	08-SEP-18
Iron (Fe)-Dissolved		0.0018	0.0025		mg/L	1.4	20	08-SEP-18
Lead (Pb)-Dissolved		<0.000010	0.000039		mg/L	0.7	20	08-SEP-18
Lithium (Li)-Dissolved		0.00121	<0.00050	RPD-NA	mg/L	N/A	20	08-SEP-18
Magnesium (Mg)-Dissolved		2.14	2.19		mg/L	1.1	20	08-SEP-18
Molybdenum (Mo)-Dissolved		<0.000050	0.000148		mg/L	0.1	20	08-SEP-18
Nickel (Ni)-Dissolved		0.00390	0.00382		mg/L	2.0	20	08-SEP-18
Potassium (K)-Dissolved		0.411	0.436		mg/L	0.2	20	08-SEP-18
Silver (Ag)-Dissolved		<0.0000050	<0.000005(	RPD-NA	mg/L	N/A	20	08-SEP-18
Sodium (Na)-Dissolved		0.783	0.776		mg/L	0.1	20	08-SEP-18
Strontium (Sr)-Dissolved		0.0199	0.0207		mg/L	0.8	20	08-SEP-18
Thallium (Tl)-Dissolved		<0.0000050	0.0000515		mg/L	6.5	20	08-SEP-18
Tin (Sn)-Dissolved		<0.000050	0.000664		mg/L	17	20	08-SEP-18
Titanium (Ti)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	08-SEP-18
Uranium (U)-Dissolved		<0.000010	0.000066		mg/L	0.0	20	08-SEP-18
Vanadium (V)-Dissolved		<0.000050	0.000097		mg/L	15	20	08-SEP-18
Zinc (Zn)-Dissolved		0.00197	0.00212		mg/L	7.4	20	08-SEP-18
WG2870449-2	**LCS**							
Aluminum (Al)-Dissolved			111.6		%		80-120	08-SEP-18
Antimony (Sb)-Dissolved			111.8		%		80-120	08-SEP-18
Arsenic (As)-Dissolved			107.0		%		80-120	08-SEP-18
Barium (Ba)-Dissolved			110.2		%		80-120	08-SEP-18
Beryllium (Be)-Dissolved			98.0		%		80-120	08-SEP-18
Bismuth (Bi)-Dissolved			104.7		%		80-120	08-SEP-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch	**R4205640**							
WG2870449-2	**LCS**							
Boron (B)-Dissolved			96.3		%		80-120	08-SEP-18
Cadmium (Cd)-Dissolved			108.3		%		80-120	08-SEP-18
Calcium (Ca)-Dissolved			101.9		%		80-120	08-SEP-18
Chromium (Cr)-Dissolved			104.6		%		80-120	08-SEP-18
Cobalt (Co)-Dissolved			105.6		%		80-120	08-SEP-18
Copper (Cu)-Dissolved			105.5		%		80-120	08-SEP-18
Iron (Fe)-Dissolved			110.1		%		80-120	08-SEP-18
Lead (Pb)-Dissolved			104.0		%		80-120	08-SEP-18
Lithium (Li)-Dissolved			97.7		%		80-120	08-SEP-18
Magnesium (Mg)-Dissolved			106.4		%		80-120	08-SEP-18
Manganese (Mn)-Dissolved			105.8		%		80-120	08-SEP-18
Molybdenum (Mo)-Dissolved			106.8		%		80-120	08-SEP-18
Nickel (Ni)-Dissolved			106.6		%		80-120	08-SEP-18
Potassium (K)-Dissolved			106.0		%		80-120	08-SEP-18
Selenium (Se)-Dissolved			103.7		%		80-120	08-SEP-18
Silver (Ag)-Dissolved			116.9		%		80-120	08-SEP-18
Sodium (Na)-Dissolved			103.8		%		80-120	08-SEP-18
Strontium (Sr)-Dissolved			103.5		%		80-120	08-SEP-18
Thallium (Tl)-Dissolved			104.1		%		80-120	08-SEP-18
Tin (Sn)-Dissolved			110.0		%		80-120	08-SEP-18
Titanium (Ti)-Dissolved			101.8		%		80-120	08-SEP-18
Uranium (U)-Dissolved			106.0		%		80-120	08-SEP-18
Vanadium (V)-Dissolved			107.3		%		80-120	08-SEP-18
Zinc (Zn)-Dissolved			109.2		%		80-120	08-SEP-18
WG2870449-1	**MB**							
Aluminum (Al)-Dissolved			<0.00030		mg/L		0.0003	08-SEP-18
Antimony (Sb)-Dissolved			<0.000020		mg/L		0.00002	08-SEP-18
Arsenic (As)-Dissolved			<0.000020		mg/L		0.00002	08-SEP-18
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	08-SEP-18
Beryllium (Be)-Dissolved			<0.000010		mg/L		0.00001	08-SEP-18
Bismuth (Bi)-Dissolved			<0.000010		mg/L		0.00001	08-SEP-18
Boron (B)-Dissolved			<0.0010		mg/L		0.001	08-SEP-18
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	08-SEP-18
Calcium (Ca)-Dissolved			<0.020		mg/L		0.02	08-SEP-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch R4205640								
WG2870449-1 MB								
Chromium (Cr)-Dissolved			<0.000060		mg/L		0.00006	08-SEP-18
Cobalt (Co)-Dissolved			<0.000010		mg/L		0.00001	08-SEP-18
Copper (Cu)-Dissolved			<0.00010		mg/L		0.0001	08-SEP-18
Iron (Fe)-Dissolved			<0.0010		mg/L		0.001	08-SEP-18
Lead (Pb)-Dissolved			<0.000010		mg/L		0.00001	08-SEP-18
Lithium (Li)-Dissolved			<0.00050		mg/L		0.0005	08-SEP-18
Magnesium (Mg)-Dissolved			<0.0040		mg/L		0.004	08-SEP-18
Manganese (Mn)-Dissolved			<0.000050		mg/L		0.00005	08-SEP-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	08-SEP-18
Nickel (Ni)-Dissolved			<0.000060		mg/L		0.00006	08-SEP-18
Potassium (K)-Dissolved			<0.020		mg/L		0.02	08-SEP-18
Selenium (Se)-Dissolved			<0.000040		mg/L		0.00004	08-SEP-18
Silver (Ag)-Dissolved			<0.000005C		mg/L		0.000005	08-SEP-18
Sodium (Na)-Dissolved			<0.0050		mg/L		0.005	08-SEP-18
Strontium (Sr)-Dissolved			<0.000050		mg/L		0.00005	08-SEP-18
Thallium (Tl)-Dissolved			<0.000005C		mg/L		0.000005	08-SEP-18
Tin (Sn)-Dissolved			<0.000050		mg/L		0.00005	08-SEP-18
Titanium (Ti)-Dissolved			<0.00010		mg/L		0.0001	08-SEP-18
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	08-SEP-18
Vanadium (V)-Dissolved			<0.000050		mg/L		0.00005	08-SEP-18
Zinc (Zn)-Dissolved			<0.00080		mg/L		0.0008	08-SEP-18
MET-T-CCMS-ED	**Water**							
Batch R4184711								
WG2855486-2 LCS		**HB_WATER**						
Silicon (Si)-Total			106.3		%		80-120	26-AUG-18
Sulfur (S)-Total			94.4		%		80-120	26-AUG-18
Zirconium (Zr)-Total			98.0		%		80-120	26-AUG-18
WG2855486-1 MB								
Silicon (Si)-Total			<0.10		mg/L		0.1	26-AUG-18
Sulfur (S)-Total			<0.50		mg/L		0.5	26-AUG-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	26-AUG-18
WG2855486-4 MS		**L2147304-2**						
Silicon (Si)-Total			95.8		%		70-130	26-AUG-18
Sulfur (S)-Total			102.1		%		70-130	26-AUG-18
Zirconium (Zr)-Total			97.8		%		70-130	26-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-ED	**Water**							
Batch R4209029								
WG2868297-2 LCS								
Silicon (Si)-Total			95.8		%		70-130	10-SEP-18
Sulfur (S)-Total			99.4		%		70-130	10-SEP-18
Zirconium (Zr)-Total			97.7		%		70-130	10-SEP-18
WG2868297-1 MB								
Silicon (Si)-Total			<0.10		mg/L		0.1	10-SEP-18
Sulfur (S)-Total			<0.50		mg/L		0.5	10-SEP-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	10-SEP-18
Batch R4214588								
WG2868282-3 DUP		**L2147304-10**						
Silicon (Si)-Total		<0.10	<0.10	RPD-NA	mg/L	N/A	20	12-SEP-18
Sulfur (S)-Total		<0.50	<0.50	RPD-NA	mg/L	N/A	20	12-SEP-18
Zirconium (Zr)-Total		<0.000060	<0.000060	RPD-NA	mg/L	N/A	20	12-SEP-18
WG2868282-2 LCS								
Silicon (Si)-Total			106.4		%		70-130	12-SEP-18
Sulfur (S)-Total			97.6		%		70-130	12-SEP-18
Zirconium (Zr)-Total			99.7		%		70-130	12-SEP-18
WG2868282-1 MB								
Silicon (Si)-Total			<0.10		mg/L		0.1	12-SEP-18
Sulfur (S)-Total			<0.50		mg/L		0.5	12-SEP-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	12-SEP-18
WG2868282-4 MS		**L2147304-20**						
Silicon (Si)-Total			94.7		%		70-130	12-SEP-18
Sulfur (S)-Total			97.8		%		70-130	12-SEP-18
Zirconium (Zr)-Total			97.4		%		70-130	12-SEP-18
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4209029								
WG2868297-2 LCS								
Aluminum (Al)-Total			99.3		%		80-120	10-SEP-18
Antimony (Sb)-Total			104.6		%		80-120	10-SEP-18
Arsenic (As)-Total			98.9		%		80-120	10-SEP-18
Barium (Ba)-Total			103.3		%		80-120	10-SEP-18
Beryllium (Be)-Total			101.9		%		80-120	10-SEP-18
Bismuth (Bi)-Total			94.6		%		80-120	10-SEP-18
Boron (B)-Total			97.7		%		80-120	10-SEP-18
Cadmium (Cd)-Total			102.1		%		80-120	10-SEP-18

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Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4209029								
WG2868297-2 LCS								
Chromium (Cr)-Total			97.6		%		80-120	10-SEP-18
Cobalt (Co)-Total			99.0		%		80-120	10-SEP-18
Copper (Cu)-Total			95.7		%		80-120	10-SEP-18
Iron (Fe)-Total			100.4		%		80-120	10-SEP-18
Lead (Pb)-Total			96.5		%		80-120	10-SEP-18
Lithium (Li)-Total			97.4		%		80-120	10-SEP-18
Manganese (Mn)-Total			99.6		%		80-120	10-SEP-18
Molybdenum (Mo)-Total			99.5		%		80-120	10-SEP-18
Nickel (Ni)-Total			97.4		%		80-120	10-SEP-18
Selenium (Se)-Total			102.9		%		80-120	10-SEP-18
Silver (Ag)-Total			98.7		%		80-120	10-SEP-18
Strontium (Sr)-Total			98.1		%		80-120	10-SEP-18
Thallium (Tl)-Total			94.6		%		80-120	10-SEP-18
Tin (Sn)-Total			103.2		%		80-120	10-SEP-18
Titanium (Ti)-Total			96.6		%		80-120	10-SEP-18
Uranium (U)-Total			96.0		%		80-120	10-SEP-18
Vanadium (V)-Total			99.1		%		80-120	10-SEP-18
Zinc (Zn)-Total			93.1		%		80-120	10-SEP-18
WG2868297-1 MB								
Aluminum (Al)-Total			<0.00030		mg/L		0.0003	10-SEP-18
Antimony (Sb)-Total			<0.000020		mg/L		0.00002	10-SEP-18
Arsenic (As)-Total			<0.000020		mg/L		0.00002	10-SEP-18
Barium (Ba)-Total			<0.000050		mg/L		0.00005	10-SEP-18
Beryllium (Be)-Total			<0.000010		mg/L		0.00001	10-SEP-18
Bismuth (Bi)-Total			<0.000010		mg/L		0.00001	10-SEP-18
Boron (B)-Total			<0.0010		mg/L		0.001	10-SEP-18
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	10-SEP-18
Chromium (Cr)-Total			<0.000060		mg/L		0.00006	10-SEP-18
Cobalt (Co)-Total			<0.000010		mg/L		0.00001	10-SEP-18
Copper (Cu)-Total			<0.00010		mg/L		0.0001	10-SEP-18
Iron (Fe)-Total			<0.0010		mg/L		0.001	10-SEP-18
Lead (Pb)-Total			<0.000010		mg/L		0.00001	10-SEP-18
Lithium (Li)-Total			<0.00050		mg/L		0.0005	10-SEP-18
Manganese (Mn)-Total			<0.000050		mg/L		0.00005	10-SEP-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4209029								
WG2868297-1 MB								
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	10-SEP-18
Nickel (Ni)-Total			<0.000060		mg/L		0.00006	10-SEP-18
Selenium (Se)-Total			<0.000040		mg/L		0.00004	10-SEP-18
Silver (Ag)-Total			<0.000005(		mg/L		0.000005	10-SEP-18
Strontium (Sr)-Total			<0.000050		mg/L		0.00005	10-SEP-18
Thallium (Tl)-Total			<0.000005(		mg/L		0.000005	10-SEP-18
Tin (Sn)-Total			<0.000050		mg/L		0.00005	10-SEP-18
Titanium (Ti)-Total			<0.00010		mg/L		0.0001	10-SEP-18
Uranium (U)-Total			<0.000010		mg/L		0.00001	10-SEP-18
Vanadium (V)-Total			<0.000050		mg/L		0.00005	10-SEP-18
Zinc (Zn)-Total			<0.00080		mg/L		0.0008	10-SEP-18
NH3-L-CFA-ED	**Water**							
Batch R4185451								
WG2861007-11 DUP		**L2147304-12**						
Ammonia, Total (as N)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	27-AUG-18
WG2861007-15 DUP		**L2147304-26**						
Ammonia, Total (as N)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	27-AUG-18
WG2861007-18 LCS								
Ammonia, Total (as N)			100.2		%		85-115	28-AUG-18
WG2861007-5 LCS								
Ammonia, Total (as N)			96.6		%		85-115	27-AUG-18
WG2861007-6 LCS								
Ammonia, Total (as N)			95.3		%		85-115	27-AUG-18
WG2861007-7 LCS								
Ammonia, Total (as N)			94.0		%		85-115	27-AUG-18
WG2861007-8 LCS								
Ammonia, Total (as N)			98.4		%		85-115	27-AUG-18
WG2861007-1 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	27-AUG-18
WG2861007-17 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	28-AUG-18
WG2861007-2 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	27-AUG-18
WG2861007-3 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	27-AUG-18
WG2861007-4 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-L-CFA-ED	**Water**							
Batch R4185451								
WG2861007-4 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	27-AUG-18
WG2861007-12 MS		**L2147304-12**						
Ammonia, Total (as N)			107.8		%		75-125	27-AUG-18
WG2861007-16 MS		**L2147304-26**						
Ammonia, Total (as N)			112.0		%		75-125	27-AUG-18
NO2-L-IC-N-ED	**Water**							
Batch R4175968								
WG2852554-5 DUP		**L2147304-18**						
Nitrite (as N)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	17-AUG-18
WG2852554-11 LCS								
Nitrite (as N)			92.4		%		90-110	17-AUG-18
WG2852554-13 LCS								
Nitrite (as N)			99.8		%		90-110	17-AUG-18
WG2852554-15 LCS								
Nitrite (as N)			94.9		%		90-110	17-AUG-18
WG2852554-17 LCS								
Nitrite (as N)			99.3		%		90-110	17-AUG-18
WG2852554-2 LCS								
Nitrite (as N)			101.0		%		90-110	17-AUG-18
WG2852554-1 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	17-AUG-18
WG2852554-12 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	17-AUG-18
WG2852554-14 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	17-AUG-18
WG2852554-16 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	17-AUG-18
WG2852554-18 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	17-AUG-18
WG2852554-6 MS		**L2147304-18**						
Nitrite (as N)			99.9		%		75-125	17-AUG-18
NO3-L-IC-N-ED	**Water**							
Batch R4175968								
WG2852554-5 DUP		**L2147304-18**						
Nitrate (as N)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	17-AUG-18
WG2852554-11 LCS								
Nitrate (as N)			96.7		%		90-110	17-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO3-L-IC-N-ED	**Water**							
Batch R4175968								
WG2852554-13 LCS								
Nitrate (as N)			96.9		%		90-110	17-AUG-18
WG2852554-15 LCS								
Nitrate (as N)			95.2		%		90-110	17-AUG-18
WG2852554-17 LCS								
Nitrate (as N)			93.3		%		90-110	17-AUG-18
WG2852554-2 LCS								
Nitrate (as N)			96.1		%		90-110	17-AUG-18
WG2852554-1 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	17-AUG-18
WG2852554-12 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	17-AUG-18
WG2852554-14 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	17-AUG-18
WG2852554-16 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	17-AUG-18
WG2852554-18 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	17-AUG-18
WG2852554-6 MS		**L2147304-18**						
Nitrate (as N)			95.4		%		75-125	17-AUG-18
Batch R4180079								
WG2855454-11 LCS								
Nitrate (as N)			93.5		%		90-110	21-AUG-18
WG2855454-13 LCS								
Nitrate (as N)			95.3		%		90-110	21-AUG-18
WG2855454-15 LCS								
Nitrate (as N)			93.2		%		90-110	21-AUG-18
WG2855454-2 LCS								
Nitrate (as N)			98.2		%		90-110	21-AUG-18
WG2855454-1 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	21-AUG-18
WG2855454-12 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	21-AUG-18
WG2855454-14 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	21-AUG-18
WG2855454-16 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	21-AUG-18
P-T-L-COL-ED	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-L-COL-ED	**Water**							
Batch R4202069								
WG2865753-5 DUP		**L2147304-10**						
Phosphorus (P)-Total		0.0022	0.0021		mg/L	4.7	20	04-SEP-18
WG2865753-7 DUP		**L2147304-26**						
Phosphorus (P)-Total		0.0045	0.0037		mg/L	20	20	04-SEP-18
WG2865753-10 LCS								
Phosphorus (P)-Total			99.0		%		80-120	04-SEP-18
WG2865753-12 LCS								
Phosphorus (P)-Total			100.6		%		80-120	04-SEP-18
WG2865753-2 LCS								
Phosphorus (P)-Total			100.8		%		80-120	04-SEP-18
WG2865753-1 MB								
Phosphorus (P)-Total			<0.0010		mg/L		0.001	04-SEP-18
WG2865753-11 MB								
Phosphorus (P)-Total			<0.0010		mg/L		0.001	04-SEP-18
WG2865753-9 MB								
Phosphorus (P)-Total			<0.0010		mg/L		0.001	04-SEP-18
WG2865753-6 MS		**L2147304-10**						
Phosphorus (P)-Total			105.1		%		70-130	04-SEP-18
WG2865753-8 MS		**L2147304-26**						
Phosphorus (P)-Total			99.4		%		70-130	04-SEP-18
Batch R4204190								
WG2868430-2 LCS								
Phosphorus (P)-Total			99.0		%		80-120	06-SEP-18
WG2868430-1 MB								
Phosphorus (P)-Total			<0.0010		mg/L		0.001	06-SEP-18
P-TD-L-COL-ED	**Water**							
Batch R4202069								
WG2865753-5 DUP		**L2147304-10**						
Phosphorus (P)-Total	Dissolved	0.0020	0.0021		mg/L	4.9	20	04-SEP-18
WG2865753-7 DUP		**L2147304-26**						
Phosphorus (P)-Total	Dissolved	0.0050	0.0047		mg/L	6.2	20	04-SEP-18
WG2865753-10 LCS								
Phosphorus (P)-Total	Dissolved		98.8		%		80-120	04-SEP-18
WG2865753-12 LCS								
Phosphorus (P)-Total	Dissolved		99.6		%		80-120	04-SEP-18
WG2865753-2 LCS								
Phosphorus (P)-Total	Dissolved		104.4		%		80-120	04-SEP-18
WG2865753-1 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-TD-L-COL-ED	**Water**							
Batch R4202069								
WG2865753-1 MB								
Phosphorus (P)-Total	Dissolved		<0.0010		mg/L		0.001	04-SEP-18
WG2865753-11 MB								
Phosphorus (P)-Total	Dissolved		<0.0010		mg/L		0.001	04-SEP-18
WG2865753-9 MB								
Phosphorus (P)-Total	Dissolved		<0.0010		mg/L		0.001	04-SEP-18
WG2865753-6 MS		**L2147304-10**						
Phosphorus (P)-Total	Dissolved		103.9		%		70-130	04-SEP-18
WG2865753-8 MS		**L2147304-26**						
Phosphorus (P)-Total	Dissolved		106.1		%		70-130	04-SEP-18
Batch R4204190								
WG2868430-2 LCS								
Phosphorus (P)-Total	Dissolved		101.0		%		80-120	06-SEP-18
WG2868430-1 MB								
Phosphorus (P)-Total	Dissolved		<0.0010		mg/L		0.001	06-SEP-18
PH/EC/ALK-ED	**Water**							
Batch R4175983								
WG2853436-33 DUP		**L2147304-14**						
pH		6.74	6.74	J	pH	0.00	0.3	18-AUG-18
Conductivity (EC)		46.0	45.3		uS/cm	1.5	10	18-AUG-18
Bicarbonate (HCO3)		5.1	5.0		mg/L	2.4	25	18-AUG-18
Carbonate (CO3)		<5.0	<5.0	RPD-NA	mg/L	N/A	25	18-AUG-18
Hydroxide (OH)		<5.0	<5.0	RPD-NA	mg/L	N/A	25	18-AUG-18
Alkalinity, Total (as CaCO3)		4.2	4.1		mg/L	2.4	20	18-AUG-18
WG2853436-10 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			99.5		%		85-115	18-AUG-18
WG2853436-11 LCS		**HI_12890**						
Conductivity (EC)			91.9		%		90-110	18-AUG-18
WG2853436-13 LCS		**MID_1412**						
Conductivity (EC)			95.6		%		90-110	18-AUG-18
WG2853436-14 LCS		**ED-PH6**						
pH			6.00		pH		5.8-6.2	18-AUG-18
WG2853436-15 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			100.6		%		85-115	18-AUG-18
WG2853436-16 LCS		**HI_12890**						
Conductivity (EC)			92.9		%		90-110	18-AUG-18
WG2853436-18 LCS		**MID_1412**						
Conductivity (EC)			94.6		%		90-110	18-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R4175983								
WG2853436-19 LCS		**ED-PH6**						
pH			6.02		pH		5.8-6.2	18-AUG-18
WG2853436-20 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			103.5		%		85-115	18-AUG-18
WG2853436-21 LCS		**HI_12890**						
Conductivity (EC)			97.6		%		90-110	18-AUG-18
WG2853436-23 LCS		**MID_1412**						
Conductivity (EC)			96.9		%		90-110	18-AUG-18
WG2853436-24 LCS		**ED-PH6**						
pH			5.99		pH		5.8-6.2	18-AUG-18
WG2853436-25 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			101.9		%		85-115	18-AUG-18
WG2853436-26 LCS		**HI_12890**						
Conductivity (EC)			93.9		%		90-110	18-AUG-18
WG2853436-3 LCS		**ED-PH6**						
pH			6.00		pH		5.8-6.2	18-AUG-18
WG2853436-4 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			98.9		%		85-115	18-AUG-18
WG2853436-8 LCS		**MID_1412**						
Conductivity (EC)			92.8		%		90-110	18-AUG-18
WG2853436-9 LCS		**ED-PH6**						
pH			6.02		pH		5.8-6.2	18-AUG-18
WG2853436-1 MB								
Conductivity (EC)			<2.0		uS/cm		2	18-AUG-18
Bicarbonate (HCO3)			<5.0		mg/L		5	18-AUG-18
Carbonate (CO3)			<5.0		mg/L		5	18-AUG-18
Hydroxide (OH)			<5.0		mg/L		5	18-AUG-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	18-AUG-18
WG2853436-12 MB								
Conductivity (EC)			<2.0		uS/cm		2	18-AUG-18
Bicarbonate (HCO3)			<5.0		mg/L		5	18-AUG-18
Carbonate (CO3)			<5.0		mg/L		5	18-AUG-18
Hydroxide (OH)			<5.0		mg/L		5	18-AUG-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	18-AUG-18
WG2853436-17 MB								
Conductivity (EC)			<2.0		uS/cm		2	18-AUG-18
Bicarbonate (HCO3)			<5.0		mg/L		5	18-AUG-18
Carbonate (CO3)			<5.0		mg/L		5	18-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R4175983								
WG2853436-17 MB								
Hydroxide (OH)			<5.0		mg/L		5	18-AUG-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	18-AUG-18
WG2853436-22 MB								
Conductivity (EC)			<2.0		uS/cm		2	18-AUG-18
Bicarbonate (HCO3)			<5.0		mg/L		5	18-AUG-18
Carbonate (CO3)			<5.0		mg/L		5	18-AUG-18
Hydroxide (OH)			<5.0		mg/L		5	18-AUG-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	18-AUG-18
WG2853436-7 MB								
Conductivity (EC)			<2.0		uS/cm		2	18-AUG-18
Bicarbonate (HCO3)			<5.0		mg/L		5	18-AUG-18
Carbonate (CO3)			<5.0		mg/L		5	18-AUG-18
Hydroxide (OH)			<5.0		mg/L		5	18-AUG-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	18-AUG-18
PO4-DO-L-COL-ED	**Water**							
Batch R4175701								
WG2852911-3 DUP		**L2147304-1**						
Orthophosphate-Dissolved (as P)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	17-AUG-18
WG2852911-7 DUP		**L2147304-21**						
Orthophosphate-Dissolved (as P)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	17-AUG-18
WG2852911-2 LCS								
Orthophosphate-Dissolved (as P)			91.4		%		80-120	17-AUG-18
WG2852911-6 LCS								
Orthophosphate-Dissolved (as P)			89.8		%		80-120	17-AUG-18
WG2852911-1 MB								
Orthophosphate-Dissolved (as P)			<0.0010		mg/L		0.001	17-AUG-18
WG2852911-5 MB								
Orthophosphate-Dissolved (as P)			<0.0010		mg/L		0.001	17-AUG-18
WG2852911-4 MS		**L2147304-1**						
Orthophosphate-Dissolved (as P)			86.4		%		70-130	17-AUG-18
WG2852911-8 MS		**L2147304-21**						
Orthophosphate-Dissolved (as P)			105.0		%		70-130	17-AUG-18
SILICATE-COL-ED	**Water**							

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SILICATE-COL-ED	**Water**							
Batch R4176406								
WG2853860-2 LCS								
Silicate (as SiO2)			93.5		%		85-115	19-AUG-18
WG2853860-1 MB								
Silicate (as SiO2)			<1.0		mg/L		1	19-AUG-18
SILICATE-L-COL-ED	**Water**							
Batch R4176401								
WG2853856-13 DUP		**L2147304-10**						
Silicate (as SiO2)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	19-AUG-18
WG2853856-2 LCS								
Silicate (as SiO2)			103.6		%		85-115	19-AUG-18
WG2853856-4 LCS								
Silicate (as SiO2)			106.4		%		85-115	19-AUG-18
WG2853856-6 LCS								
Silicate (as SiO2)			103.2		%		85-115	19-AUG-18
WG2853856-8 LCS								
Silicate (as SiO2)			102.4		%		85-115	19-AUG-18
WG2853856-1 MB								
Silicate (as SiO2)			<0.010		mg/L		0.01	19-AUG-18
WG2853856-3 MB								
Silicate (as SiO2)			<0.010		mg/L		0.01	19-AUG-18
WG2853856-5 MB								
Silicate (as SiO2)			<0.010		mg/L		0.01	19-AUG-18
WG2853856-7 MB								
Silicate (as SiO2)			<0.010		mg/L		0.01	19-AUG-18
WG2853856-14 MS		**L2147304-10**						
Silicate (as SiO2)			92.8		%		80-120	19-AUG-18
SO4-L-IC-N-ED	**Water**							
Batch R4175968								
WG2852554-5 DUP		**L2147304-18**						
Sulfate (SO4)		8.11	8.24		mg/L	1.5	20	17-AUG-18
WG2852554-11 LCS								
Sulfate (SO4)			99.6		%		90-110	17-AUG-18
WG2852554-13 LCS								
Sulfate (SO4)			98.4		%		90-110	17-AUG-18
WG2852554-15 LCS								
Sulfate (SO4)			100.5		%		90-110	17-AUG-18
WG2852554-17 LCS								
Sulfate (SO4)			98.5		%		90-110	17-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-L-IC-N-ED	**Water**							
Batch R4175968								
WG2852554-2 LCS								
Sulfate (SO4)			98.8		%		90-110	17-AUG-18
WG2852554-1 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	17-AUG-18
WG2852554-12 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	17-AUG-18
WG2852554-14 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	17-AUG-18
WG2852554-16 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	17-AUG-18
WG2852554-18 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	17-AUG-18
WG2852554-6 MS		**L2147304-18**						
Sulfate (SO4)			100.3		%		75-125	17-AUG-18
SOLIDS-TDS-ED	**Water**							
Batch R4179259								
WG2854026-3 DUP		**L2147304-14**						
Total Dissolved Solids		42	42		mg/L	0.0	20	20-AUG-18
WG2854026-2 LCS								
Total Dissolved Solids			96.2		%		85-115	20-AUG-18
WG2854026-1 MB								
Total Dissolved Solids			<10		mg/L		10	20-AUG-18
Batch R4180280								
WG2854968-2 LCS								
Total Dissolved Solids			101.9		%		85-115	21-AUG-18
WG2854968-1 MB								
Total Dissolved Solids			<10		mg/L		10	21-AUG-18
SOLIDS-TOTSUS-ED	**Water**							
Batch R4177508								
WG2853402-2 LCS								
Total Suspended Solids			91.6		%		85-115	18-AUG-18
WG2853402-1 MB								
Total Suspended Solids			<3.0		mg/L		3	18-AUG-18
Batch R4179142								
WG2854473-2 LCS								
Total Suspended Solids			89.2		%		85-115	20-AUG-18
WG2854473-1 MB								
Total Suspended Solids			<3.0		mg/L		3	20-AUG-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SULPHIDE-CFA-ED	**Water**							
Batch R4176227								
WG2853610-3 DUP		**L2147304-20**						
Sulphide (as S)		<0.0015	<0.0015	RPD-NA	mg/L	N/A	20	18-AUG-18
WG2853610-9 DUP		**L2147304-10**						
Sulphide (as S)		<0.0015	<0.0015	RPD-NA	mg/L	N/A	20	18-AUG-18
WG2853610-12 LCS								
Sulphide (as S)			83.1		%		75-125	18-AUG-18
WG2853610-2 LCS								
Sulphide (as S)			106.5		%		75-125	18-AUG-18
WG2853610-6 LCS								
Sulphide (as S)			98.4		%		75-125	18-AUG-18
WG2853610-1 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	18-AUG-18
WG2853610-11 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	18-AUG-18
WG2853610-5 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	18-AUG-18
WG2853610-10 MS		**L2147304-10**						
Sulphide (as S)			107.8		%		65-135	18-AUG-18
WG2853610-4 MS		**L2147304-20**						
Sulphide (as S)			94.2		%		65-135	18-AUG-18
TKN-L-CFA-ED	**Water**							
Batch R4199928								
WG2865741-2 LCS								
Total Kjeldahl Nitrogen			110		%		75-125	04-SEP-18
WG2865741-6 LCS								
Total Kjeldahl Nitrogen			107		%		75-125	04-SEP-18
WG2865741-1 MB								
Total Kjeldahl Nitrogen			<0.050		mg/L		0.05	04-SEP-18
WG2865741-5 MB								
Total Kjeldahl Nitrogen			<0.050		mg/L		0.05	04-SEP-18
TURBIDITY-ED	**Water**							
Batch R4175602								
WG2852913-3 DUP		**L2147304-10**						
Turbidity		<0.10	<0.10	RPD-NA	NTU	N/A	15	17-AUG-18
WG2852913-6 DUP		**L2147304-24**						
Turbidity		0.48	0.42		NTU	13	15	17-AUG-18
WG2852913-2 LCS								
Turbidity			98.6		%		95-105	17-AUG-18

[redacted]

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TURBIDITY-ED	**Water**							
Batch R4175602								
WG2852913-5 LCS								
Turbidity			97.8		%		95-105	17-AUG-18
WG2852913-1 MB								
Turbidity			<0.10		NTU		0.1	17-AUG-18
WG2852913-4 MB								
Turbidity			<0.10		NTU		0.1	17-AUG-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
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
J	Duplicate results and limits are expressed in terms of absolute difference.
MB-LOR	Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
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							
Color, True							
	1	10-AUG-18 08:40	17-AUG-18 14:00	3	7	days	EHTR
	2	11-AUG-18 14:20	17-AUG-18 14:00	3	6	days	EHTR
	3	11-AUG-18 14:45	17-AUG-18 14:00	3	6	days	EHTR
	4	11-AUG-18 15:10	17-AUG-18 14:00	3	6	days	EHTR
	5	11-AUG-18 15:45	17-AUG-18 14:00	3	6	days	EHTR
	6	11-AUG-18 15:45	17-AUG-18 14:00	3	6	days	EHTR
	7	11-AUG-18 14:00	17-AUG-18 14:00	3	6	days	EHTR
	8	11-AUG-18 13:40	17-AUG-18 14:00	3	6	days	EHTR
	9	11-AUG-18 16:00	17-AUG-18 14:00	3	6	days	EHTR
	11	12-AUG-18 08:45	17-AUG-18 14:00	3	5	days	EHTR
	12	12-AUG-18 09:50	17-AUG-18 14:00	3	5	days	EHTR
	13	12-AUG-18 10:15	17-AUG-18 14:00	3	5	days	EHTR
	14	12-AUG-18 11:15	17-AUG-18 14:00	3	5	days	EHTR
	15	12-AUG-18 12:00	17-AUG-18 14:00	3	5	days	EHTL
	16	12-AUG-18 12:50	17-AUG-18 14:00	3	5	days	EHTL
	17	12-AUG-18 13:30	17-AUG-18 14:00	3	5	days	EHTL
	18	12-AUG-18 14:50	17-AUG-18 14:00	3	5	days	EHTL
	19	13-AUG-18 10:50	17-AUG-18 14:00	3	4	days	EHTL
	20	13-AUG-18 11:40	17-AUG-18 14:00	3	4	days	EHT
	21	13-AUG-18 13:00	17-AUG-18 14:00	3	4	days	EHT
	22	13-AUG-18 09:00	17-AUG-18 14:00	3	4	days	EHTL
	23	13-AUG-18 08:45	17-AUG-18 14:00	3	4	days	EHTL
	24	13-AUG-18 09:30	17-AUG-18 14:00	3	4	days	EHTL
	25	13-AUG-18 10:10	17-AUG-18 14:00	3	4	days	EHTL
	26	13-AUG-18 08:45	17-AUG-18 14:00	3	4	days	EHTL
Total Dissolved Solids							
	1	10-AUG-18 08:40	20-AUG-18 00:00	7	10	days	EHT
	2	11-AUG-18 14:20	20-AUG-18 00:00	7	8	days	EHT
	3	11-AUG-18 14:45	20-AUG-18 00:00	7	8	days	EHT
	4	11-AUG-18 15:10	20-AUG-18 00:00	7	8	days	EHT
	5	11-AUG-18 15:45	20-AUG-18 00:00	7	8	days	EHT
	6	11-AUG-18 15:45	20-AUG-18 00:00	7	8	days	EHT
	7	11-AUG-18 14:00	20-AUG-18 00:00	7	8	days	EHT
	8	11-AUG-18 13:40	20-AUG-18 00:00	7	8	days	EHT
	9	11-AUG-18 16:00	20-AUG-18 00:00	7	8	days	EHT
	11	12-AUG-18 08:45	20-AUG-18 00:00	7	8	days	EHT
	12	12-AUG-18 09:50	20-AUG-18 00:00	7	8	days	EHT
	13	12-AUG-18 10:15	20-AUG-18 00:00	7	8	days	EHT
	14	12-AUG-18 11:15	20-AUG-18 00:00	7	8	days	EHT
	15	12-AUG-18 12:00	20-AUG-18 00:00	7	8	days	EHT
	22	13-AUG-18 09:00	21-AUG-18 00:00	7	8	days	EHT
	23	13-AUG-18 08:45	21-AUG-18 00:00	7	8	days	EHT
	24	13-AUG-18 09:30	21-AUG-18 00:00	7	8	days	EHT
	25	13-AUG-18 10:10	21-AUG-18 00:00	7	8	days	EHT
	26	13-AUG-18 08:45	21-AUG-18 00:00	7	8	days	EHT
Total Suspended Solids							
	1	10-AUG-18 08:40	18-AUG-18 00:00	7	8	days	EHT
	14	12-AUG-18 11:15	20-AUG-18 00:00	7	8	days	EHT
	15	12-AUG-18 12:00	20-AUG-18 00:00	7	8	days	EHT
Turbidity							
	1	10-AUG-18 08:40	17-AUG-18 16:00	3	7	days	EHTR
	2	11-AUG-18 14:20	17-AUG-18 16:00	3	6	days	EHTR
	3	11-AUG-18 14:45	17-AUG-18 16:00	3	6	days	EHTR
	4	11-AUG-18 15:10	17-AUG-18 16:00	3	6	days	EHTR
	5	11-AUG-18 15:45	17-AUG-18 16:00	3	6	days	EHTR
	6	11-AUG-18 15:45	17-AUG-18 16:00	3	6	days	EHTR

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Turbidity							
	7	11-AUG-18 14:00	17-AUG-18 16:00	3	6	days	EHTR
	8	11-AUG-18 13:40	17-AUG-18 16:00	3	6	days	EHTR
	9	11-AUG-18 16:00	17-AUG-18 16:00	3	6	days	EHTR
	11	12-AUG-18 08:45	17-AUG-18 16:00	3	5	days	EHTR
	12	12-AUG-18 09:50	17-AUG-18 16:00	3	5	days	EHTR
	13	12-AUG-18 10:15	17-AUG-18 16:00	3	5	days	EHTR
	14	12-AUG-18 11:15	17-AUG-18 16:00	3	5	days	EHTR
	15	12-AUG-18 12:00	17-AUG-18 16:00	3	5	days	EHTL
	16	12-AUG-18 12:50	17-AUG-18 16:00	3	5	days	EHTL
	17	12-AUG-18 13:30	17-AUG-18 16:00	3	5	days	EHTL
	18	12-AUG-18 14:50	17-AUG-18 16:00	3	5	days	EHTL
	19	13-AUG-18 10:50	17-AUG-18 16:00	3	4	days	EHTL
	20	13-AUG-18 11:40	17-AUG-18 16:00	3	4	days	EHT
	21	13-AUG-18 13:00	17-AUG-18 16:00	3	4	days	EHT
	22	13-AUG-18 09:00	17-AUG-18 16:00	3	4	days	EHTL
	23	13-AUG-18 08:45	17-AUG-18 16:00	3	4	days	EHTL
	24	13-AUG-18 09:30	17-AUG-18 16:00	3	4	days	EHTL
	25	13-AUG-18 10:10	17-AUG-18 16:00	3	4	days	EHTL
	26	13-AUG-18 08:45	17-AUG-18 16:00	3	4	days	EHTL
Leachable Anions & Nutrients							
Diss. Orthophosphate in Water by Colour							
	1	10-AUG-18 08:40	17-AUG-18 00:00	3	7	days	EHTR
	2	11-AUG-18 14:20	17-AUG-18 00:00	3	5	days	EHTR
	3	11-AUG-18 14:45	17-AUG-18 00:00	3	5	days	EHTR
	4	11-AUG-18 15:10	17-AUG-18 00:00	3	5	days	EHTR
	5	11-AUG-18 15:45	17-AUG-18 00:00	3	5	days	EHTR
	6	11-AUG-18 15:45	17-AUG-18 00:00	3	5	days	EHTR
	7	11-AUG-18 14:00	17-AUG-18 00:00	3	5	days	EHTR
	8	11-AUG-18 13:40	17-AUG-18 00:00	3	5	days	EHTR
	9	11-AUG-18 16:00	17-AUG-18 00:00	3	5	days	EHTR
	11	12-AUG-18 08:45	17-AUG-18 00:00	3	5	days	EHTR
	12	12-AUG-18 09:50	17-AUG-18 00:00	3	5	days	EHTR
	13	12-AUG-18 10:15	17-AUG-18 00:00	3	5	days	EHTR
	14	12-AUG-18 11:15	17-AUG-18 00:00	3	5	days	EHTR
	15	12-AUG-18 12:00	17-AUG-18 00:00	3	5	days	EHTL
	16	12-AUG-18 12:50	17-AUG-18 00:00	3	4	days	EHTL
	17	12-AUG-18 13:30	17-AUG-18 00:00	3	4	days	EHTL
	18	12-AUG-18 14:50	17-AUG-18 00:00	3	4	days	EHTL
	19	13-AUG-18 10:50	17-AUG-18 00:00	3	4	days	EHTL
	20	13-AUG-18 11:40	17-AUG-18 00:00	3	4	days	EHT
	22	13-AUG-18 09:00	17-AUG-18 00:00	3	4	days	EHTL
	23	13-AUG-18 08:45	17-AUG-18 00:00	3	4	days	EHTL
	24	13-AUG-18 09:30	17-AUG-18 00:00	3	4	days	EHTL
	25	13-AUG-18 10:10	17-AUG-18 00:00	3	4	days	EHTL
	26	13-AUG-18 08:45	17-AUG-18 00:00	3	4	days	EHTL
Anions and Nutrients							
Nitrate in Water by IC (Low Level)							
	1	10-AUG-18 08:40	17-AUG-18 08:00	3	7	days	EHTR
	2	11-AUG-18 14:20	17-AUG-18 08:00	3	6	days	EHTR
	3	11-AUG-18 14:45	17-AUG-18 08:00	3	6	days	EHTR
	4	11-AUG-18 15:10	17-AUG-18 08:00	3	6	days	EHTR
	5	11-AUG-18 15:45	17-AUG-18 08:00	3	6	days	EHTR
	6	11-AUG-18 15:45	17-AUG-18 08:00	3	6	days	EHTR
	7	11-AUG-18 14:00	17-AUG-18 08:00	3	6	days	EHTR
	8	11-AUG-18 13:40	17-AUG-18 08:00	3	6	days	EHTR
	9	11-AUG-18 16:00	17-AUG-18 08:00	3	6	days	EHTR

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Anions and Nutrients							
Nitrate in Water by IC (Low Level)							
	10	14-AUG-18 11:45	21-AUG-18 08:00	3	7	days	EHT
	11	12-AUG-18 08:45	17-AUG-18 08:00	3	5	days	EHTR
	12	12-AUG-18 09:50	17-AUG-18 08:00	3	5	days	EHTR
	13	12-AUG-18 10:15	17-AUG-18 08:00	3	5	days	EHTR
	14	12-AUG-18 11:15	17-AUG-18 08:00	3	5	days	EHTR
	15	12-AUG-18 12:00	17-AUG-18 08:00	3	5	days	EHTL
	16	12-AUG-18 12:50	17-AUG-18 08:00	3	5	days	EHTL
	17	12-AUG-18 13:30	17-AUG-18 08:00	3	5	days	EHTL
	18	12-AUG-18 14:50	17-AUG-18 08:00	3	5	days	EHTL
	19	13-AUG-18 10:50	17-AUG-18 08:00	3	4	days	EHTL
	20	13-AUG-18 11:40	17-AUG-18 08:00	3	4	days	EHT
	21	13-AUG-18 13:00	17-AUG-18 08:00	3	4	days	EHT
	22	13-AUG-18 09:00	17-AUG-18 08:00	3	4	days	EHTL
	23	13-AUG-18 08:45	17-AUG-18 08:00	3	4	days	EHTL
	24	13-AUG-18 09:30	17-AUG-18 08:00	3	4	days	EHTL
	25	13-AUG-18 10:10	17-AUG-18 08:00	3	4	days	EHTL
	26	13-AUG-18 08:45	17-AUG-18 08:00	3	4	days	EHTL
Nitrite in Water by IC (Low Level)							
	1	10-AUG-18 08:40	17-AUG-18 08:00	3	7	days	EHTR
	2	11-AUG-18 14:20	17-AUG-18 08:00	3	6	days	EHTR
	3	11-AUG-18 14:45	17-AUG-18 08:00	3	6	days	EHTR
	4	11-AUG-18 15:10	17-AUG-18 08:00	3	6	days	EHTR
	5	11-AUG-18 15:45	17-AUG-18 08:00	3	6	days	EHTR
	6	11-AUG-18 15:45	17-AUG-18 08:00	3	6	days	EHTR
	7	11-AUG-18 14:00	17-AUG-18 08:00	3	6	days	EHTR
	8	11-AUG-18 13:40	17-AUG-18 08:00	3	6	days	EHTR
	9	11-AUG-18 16:00	17-AUG-18 08:00	3	6	days	EHTR
	11	12-AUG-18 08:45	17-AUG-18 08:00	3	5	days	EHTR
	12	12-AUG-18 09:50	17-AUG-18 08:00	3	5	days	EHTR
	13	12-AUG-18 10:15	17-AUG-18 08:00	3	5	days	EHTR
	14	12-AUG-18 11:15	17-AUG-18 08:00	3	5	days	EHTR
	15	12-AUG-18 12:00	17-AUG-18 08:00	3	5	days	EHTL
	16	12-AUG-18 12:50	17-AUG-18 08:00	3	5	days	EHTL
	17	12-AUG-18 13:30	17-AUG-18 08:00	3	5	days	EHTL
	18	12-AUG-18 14:50	17-AUG-18 08:00	3	5	days	EHTL
	19	13-AUG-18 10:50	17-AUG-18 08:00	3	4	days	EHTL
	20	13-AUG-18 11:40	17-AUG-18 08:00	3	4	days	EHT
	21	13-AUG-18 13:00	17-AUG-18 08:00	3	4	days	EHT
	22	13-AUG-18 09:00	17-AUG-18 08:00	3	4	days	EHTL
	23	13-AUG-18 08:45	17-AUG-18 08:00	3	4	days	EHTL
	24	13-AUG-18 09:30	17-AUG-18 08:00	3	4	days	EHTL
	25	13-AUG-18 10:10	17-AUG-18 08:00	3	4	days	EHTL
	26	13-AUG-18 08:45	17-AUG-18 08:00	3	4	days	EHTL
Sulphide							
	1	10-AUG-18 08:40	18-AUG-18 00:00	7	8	days	EHT
Organic / Inorganic Carbon							
Dissolved Organic Carbon							
	1	10-AUG-18 08:40	11-SEP-18 08:00	28	32	days	EHT
	2	11-AUG-18 14:20	11-SEP-18 08:00	28	31	days	EHT
	3	11-AUG-18 14:45	11-SEP-18 08:00	28	31	days	EHT
	4	11-AUG-18 15:10	11-SEP-18 08:00	28	31	days	EHT
	5	11-AUG-18 15:45	11-SEP-18 08:00	28	31	days	EHT
	6	11-AUG-18 15:45	11-SEP-18 08:00	28	31	days	EHT
	7	11-AUG-18 14:00	11-SEP-18 08:00	28	31	days	EHT
	8	11-AUG-18 13:40	11-SEP-18 08:00	28	31	days	EHT
	9	11-AUG-18 16:00	11-SEP-18 08:00	28	31	days	EHT

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Organic / Inorganic Carbon							
Dissolved Organic Carbon							
	11	12-AUG-18 08:45	11-SEP-18 09:00	28	30	days	EHT
	12	12-AUG-18 09:50	11-SEP-18 09:00	28	30	days	EHT
	13	12-AUG-18 10:15	11-SEP-18 09:00	28	30	days	EHT
	14	12-AUG-18 11:15	11-SEP-18 09:00	28	30	days	EHT
	15	12-AUG-18 12:00	11-SEP-18 09:00	28	30	days	EHT
	16	12-AUG-18 12:50	11-SEP-18 09:00	28	30	days	EHT
	17	12-AUG-18 13:30	11-SEP-18 09:00	28	30	days	EHT
	18	12-AUG-18 14:50	11-SEP-18 09:00	28	30	days	EHT
	19	13-AUG-18 10:50	11-SEP-18 09:00	28	29	days	EHT
	20	13-AUG-18 11:40	11-SEP-18 09:00	28	29	days	EHT
	21	13-AUG-18 13:00	11-SEP-18 09:00	28	29	days	EHT
	22	13-AUG-18 09:00	12-SEP-18 08:00	28	30	days	EHT
	23	13-AUG-18 08:45	11-SEP-18 09:00	28	29	days	EHT
	24	13-AUG-18 09:30	11-SEP-18 08:00	28	29	days	EHT
	25	13-AUG-18 10:10	11-SEP-18 08:00	28	29	days	EHT
	26	13-AUG-18 08:45	11-SEP-18 08:00	28	29	days	EHT
Total Organic Carbon							
	1	10-AUG-18 08:40	11-SEP-18 08:00	28	32	days	EHT
	2	11-AUG-18 14:20	11-SEP-18 08:00	28	31	days	EHT
	3	11-AUG-18 14:45	11-SEP-18 08:00	28	31	days	EHT
	4	11-AUG-18 15:10	11-SEP-18 08:00	28	31	days	EHT
	5	11-AUG-18 15:45	11-SEP-18 08:00	28	31	days	EHT
	6	11-AUG-18 15:45	11-SEP-18 08:00	28	31	days	EHT
	7	11-AUG-18 14:00	11-SEP-18 08:00	28	31	days	EHT
	8	11-AUG-18 13:40	11-SEP-18 08:00	28	31	days	EHT
	9	11-AUG-18 16:00	11-SEP-18 08:00	28	31	days	EHT
	11	12-AUG-18 08:45	11-SEP-18 09:00	28	30	days	EHT
	12	12-AUG-18 09:50	11-SEP-18 09:00	28	30	days	EHT
	13	12-AUG-18 10:15	11-SEP-18 09:00	28	30	days	EHT
	14	12-AUG-18 11:15	11-SEP-18 09:00	28	30	days	EHT
	15	12-AUG-18 12:00	11-SEP-18 09:00	28	30	days	EHT
	16	12-AUG-18 12:50	11-SEP-18 09:00	28	30	days	EHT
	17	12-AUG-18 13:30	11-SEP-18 09:00	28	30	days	EHT
	18	12-AUG-18 14:50	11-SEP-18 09:00	28	30	days	EHT
	19	13-AUG-18 10:50	11-SEP-18 09:00	28	29	days	EHT
	20	13-AUG-18 11:40	11-SEP-18 09:00	28	29	days	EHT
	21	13-AUG-18 13:00	11-SEP-18 09:00	28	29	days	EHT
	22	13-AUG-18 09:00	11-SEP-18 09:00	28	29	days	EHT
	23	13-AUG-18 08:45	11-SEP-18 09:00	28	29	days	EHT
	24	13-AUG-18 09:30	11-SEP-18 08:00	28	29	days	EHT
	25	13-AUG-18 10:10	11-SEP-18 08:00	28	29	days	EHT
	26	13-AUG-18 08:45	11-SEP-18 08:00	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 L2147304 were received on 15-AUG-18 11:45.

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

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

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Report To	
Company:	Golder Associates Ltd.
Contact:	Zenovia Craciunescu/Kerrie Serben
Address:	16820 107 Avenue Edmonton, Alberta, Canada T5P 4C3
Phone:	+1 780 930 6786/ +1 306 667 1531

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Quality Control (QC) Report with Report	☑ Yes ☐ No
☐ Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	mkeefe@sabinagoldsilver.com
Email 2	zcraciunescu@golder.com; Kerrie_Serben@golder.com

Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)	
R	☑ Regular (Standard TAT if received by 3 pm - business days)
P	☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
E	☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
E2	☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Specify Date Required for E2,E or P:	

Invoice To	Same as Report To ☐ Yes ☑ No
	Copy of Invoice with Report ☐ Yes ☑ No
Company:	Sabina Gold and Silver
Contact:	Merle Keefe (604 998 4190) mkeefe@sabinagoldsilver.com

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	mkeefe@sabinagoldsilver.com
Email 2	

Project Information	
ALS Bottle Order	BR210169/ Quote: Q63297
Job #:	1787890/2300
PO / AFE:	
LSD:	

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

ALS Lab Work Order # (lab use only): L2147304

ALS Contact: Jessica Spira **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	GLD-CAL-WQ-MET-DU-ED	GLD-CAL-WQ-MET-TU-ED	GLD-CAL-WQ-NUT-ED	GLD-CAL-WQ-ROU-ED	HG-D-U-CVAF-VA	HG-T-U-CVAF-VA	N-T-CALC-ED	PO4-DO-L-COL-ED	SILICATE-L-COL-ED	Cyanides	Radium-226	Chlorophyll a	Number of Containers
1	BRP-33-5	Aug 10, 18	8:40	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
2	BRP-23	Aug 11, 18	14:20	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		11
3	BRP-34-A	Aug 11, 18	14:45	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		11
4	BRP-34-B	Aug 11, 18	15:10	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		11
				Water													11
	Diss. Hg for BRP-33-5 not field filtered			Water													
	All other dissolved bottles are field filtered.			Water													
				Water													
				Water													
				Water													
				Water													
				Water													
				Water													

L2147304-COFC

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

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
7.4					

SHIPMENT RELEASE (client use)		
Released by: Zenovia C.	Date: Aug 11, 18	Time: 19:00

INITIAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date: 15/8	Time: 17:45

FINAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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

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

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

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

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Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Golder Associates Ltd.	Select Report Format: ☑PDF ☑EXCEL ☑EDD (DIGITAL)	R ☑Regular (Standard TAT if received by 3 pm - business days)
Contact:	Zenovia Craciunescu/Kerrie Serben	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	16820 107 Avenue Edmonton, Alberta, Canada T5P 4C3	☐Criteria on Report - provide details below if box checked Select Distribution: ☑EMAIL ☐MAIL ☐FAX	E ☐Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	+1 780 930 6786/ +1 306 667 1531	Email 1 or Fax mkeefe@sabinagoldsilver.com	Specify Date Required for E2,E or P:
		Email 2 zcraciunescu@golder.com; Kerrie_Serben@golder.com	

Invoice To		Invoice Distribution	Analysis Request
	Same as Report To ☐ Yes ☑ No	Select Invoice Distribution: ☑EMAIL ☐MAIL ☐FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☐ Yes ☑ No	Email 1 or Fax mkeefe@sabinagoldsilver.com	
Company:	Sabina Gold and Silver	Email 2	
Contact:	Merle Keefe (604 998 4190) mkeefe@sabinagoldsilver.com		

Project Information		Oil and Gas Required Fields (client use)	
ALS Bottle Order	BR210169/ Quote: Q63297	Approver ID:	Cost Center:
Job #:	1787890/2300	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): L2147304 | **ALS Contact:** Jessica Spira | **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	GLD-CAL-WQ-MET-DU-ED	GLD-CAL-WQ-MET-TU-ED	GLD-CAL-WQ-NUT-ED	GLD-CAL-WQ-ROU-ED	HG-D-U-CVAF-VA	HG-T-U-CVAF-VA	N-T-CALC-ED	PO4-DO-L-COL-ED	SILICATE-L-COL-ED	Cyanides	Radium-226	Chlorophyll a		Number of Containers
5	BRP-39-A	Aug 11, 18	15:45	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
6	BRP-39-B	Aug 11, 18	15:45	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														
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				Water														
				Water														
				Water														
				Water														
				Water														

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

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
12.2					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
Zenovia C.	Aug 11, 18	19:00		15/8	12:45			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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

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

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

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 3 of 8

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Golder Associates Ltd.	Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Zenovia Craciunescu/Kerrie Serben	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	16820 107 Avenue Edmonton, Alberta, Canada T5P 4C3	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
Phone:	+1 780 930 6786/ +1 306 667 1531	Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
		Email 1 or Fax	mkeefe@sabinagoldsilver.com	Specify Date Required for E2, E or P:
		Email 2	zcraciunescu@golder.com; Kerrie_Serben@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	mkeefe@sabinagoldsilver.com
Company:	Sabina Gold and Silver	Email 2	
Contact:	Merle Keefe (604 998 4190) mkeefe@sabinagoldsilver.com		

Project Information		Oil and Gas Required Fields (client use)	
ALS Bottle Order	BR210169/ Quote: Q63297	Approver ID:	Cost Center:
Job #:	1787890/2300	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): L2147304 **ALS Contact:** Jessica Spira **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	GLD-CAL-WQ-MET-DU-ED	GLD-CAL-WQ-MET-TU-ED	GLD-CAL-WQ-NUT-ED	GLD-CAL-WQ-ROU-ED	HG-D-U-CVAF-VA	HG-T-U-CVAF-VA	N-T-CALC-ED	PO4-DO-L-COL-ED	SILICATE-L-COL-ED	Cyanides	Radium-226	Chlorophyll a		Number of Containers
7	BRP-18	Aug 11, 18	14:00	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
8	BRP-19	Aug 11, 18	13:40	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														

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

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
10.6					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
Zenovia C.	Aug 11, 18	1900	OG	15/8	17:45			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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

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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.**

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 4 of 8

Report To	
Company:	Golder Associates Ltd.
Contact:	Zenovia Craciunescu/Kerrie Serben
Address:	16820 107 Avenue Edmonton, Alberta, Canada T5P 4C3
Phone:	+1 780 930 6786/ +1 306 667 1531

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Quality Control (QC) Report with Report	☑ Yes ☐ No
☐ Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	mkeefe@sabinagoldsilver.com
Email 2	zcraciunescu@golder.com; Kerrie_Serben@golder.com

Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)	
R	☑ Regular (Standard TAT if received by 3 pm - business days)
P	☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
E	☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
E2	☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Specify Date Required for E2,E or P:	

Invoice To	Same as Report To ☐ Yes ☑ No	Invoice Distribution	
	Copy of Invoice with Report ☐ Yes ☑ No	Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Company:	Sabina Gold and Silver	Email 1 or Fax	mkeefe@sabinagoldsilver.com
Contact:	Merle Keefe (604 998 4190) mkeefe@sabinagoldsilver.com	Email 2	

Project Information	
ALS Bottle Order	BR210169/ Quote: Q63297
Job #:	1787890/2300
PO / AFE:	
LSD:	

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

ALS Lab Work Order # (lab use only): L2147304

ALS Contact: Jessica Spira

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	GLD-CAL-WQ-MET-DU-ED	GLD-CAL-WQ-MET-TU-ED	GLD-CAL-WQ-NUT-ED	GLD-CAL-WQ-ROU-ED	HG-D-U-CVAF-VA	HG-T-U-CVAF-VA	N-T-CALC-ED	PO4-DO-L-COL-ED	SILICATE-L-COL-ED	Cyanides	Radium-226	Chlorophyll a	Number of Containers
9	BRP-QC-1	Aug 11, 18	1600	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
10	TRIP BLANK	Aug 11, 18	—	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
				Water													
				Water													
				Water													
				Water													
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				Water													
				Water													

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

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
10.0					

SHIPMENT RELEASE (client use)		
Released by: Zenovia C.	Date: Aug 11, 18	Time: 1900

INITIAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date: 15/8	Time: 8:45

FINAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:

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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**.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 5 of 8

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Golder Associates Ltd.	Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)	R ☑ Regular (Standard TAT if received by 3 pm - business days)
Contact:	Zenovia Craciunescu/Kerrie Serben	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	16820 107 Avenue Edmonton, Alberta, Canada T5P 4C3	☐ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
Phone:	+1 780 930 6786/ +1 306 667 1531	Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
		Email 1 or Fax	mkeefe@sabinagoldsilver.com	Specify Date Required for E2,E or P:
		Email 2	zcraciunescu@golder.com; Kerrie_Serben@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:	Sabina Gold and Silver	Email 1 or Fax	mkeefe@sabinagoldsilver.com
Contact:	Merle Keefe (604 998 4190) mkeefe@sabinagoldsilver.com	Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Bottle Order	BR210169/ Quote: Q63297	Approver ID:	Cost Center:
Job #:	1787890/2300	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): L2147304 **ALS Contact:** Jessica Spira **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	GLD-CAL-WQ-MET-DU-ED	GLD-CAL-WQ-MET-TU-ED	GLD-CAL-WQ-NUT-ED	GLD-CAL-WQ-ROU-ED	HG-D-U-CVAF-VA	HG-T-U-CVAF-VA	N-T-CALC-ED	PO4-DO-L-COL-ED	SILICATE-L-COL-ED	Cyanides	Radium-226	Chlorophyll a		Number of Containers
11 21	BRP 31-1	Aug 12, 18	8:45	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			11
12 22	BRP 31-2	"	9:50	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			11
13 23	BRP 31-3	"	10:15	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			11
14 24	BRP 31-4	"	11:10	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			11
				Water														
	diss. Hg and diss. metals were not filtered in the field, nor preserved			Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														

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

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

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

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

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
8.3					

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:
Zenovia Craciunescu	Aug 12	1700	OG	18/8	1743			

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

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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**.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 6 of 8

Report To	
Company:	Golder Associates Ltd.
Contact:	Zenovia Craciunescu/Kerrie Serben
Address:	16820 107 Avenue Edmonton, Alberta, Canada T5P 4C3
Phone:	+1 780 930 6786/ +1 306 667 1531

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Quality Control (QC) Report with Report	☑ Yes ☐ No
☐ Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	mkeefe@sabinagoldsilver.com
Email 2	zcraciunescu@golder.com; Kerrie_Serben@golder.com

Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)	
R	☑ Regular (Standard TAT if received by 3 pm - business days)
P	☐ Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
E	☐ Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
E2	☐ Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Specify Date Required for E2,E or P:	

Invoice To		
	Same as Report To	☐ Yes ☑ No
	Copy of Invoice with Report	☐ Yes ☑ No
Company:	Sabina Gold and Silver	
Contact:	Merle Keefe (604 998 4190) mkeefe@sabinagoldsilver.com	

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	mkeefe@sabinagoldsilver.com
Email 2	

Project Information	
ALS Bottle Order	BR210169/ Quote: Q63297
Job #:	1787890/2300
PO / AFE:	
LSD:	

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

ALS Lab Work Order # (lab use only): L2147305

ALS Contact: Jessica Spira **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	GLD-CAL-WQ-MET-DU-ED	GLD-CAL-WQ-MET-TU-ED	GLD-CAL-WQ-NUT-ED	GLD-CAL-WQ-ROU-ED	HG-D-U-CVAF-VA	HG-T-U-CVAF-VA	N-T-CALC-ED	PO4-DO-L-COL-ED	SILICATE-L-COL-ED	Cyanides	Radium-226	Chlorophyll a		Number of Containers
15	BRP-31-5	Aug 12, 18	12:00	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			11
16	BRP-29-1	-11-	12:50	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			11
17	BRP-29-2	-11-	13:30	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			11
18	BRP-29-3	-11-	14:50	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			11
19				Water														
20	Diss. Hg and diss metals were not field filtered nor preserved			Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														

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

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
10.1					

SHIPMENT RELEASE (client use)		
Released by: Zenovia Craciunescu	Date: Aug 13, 18	Time: 1400

INITIAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date: 15/8	Time: 11:45

FINAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:

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

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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.**

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 -

Page 7 of 9

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Golder Associates Ltd.	Select Report Format: ☑PDF ☑EXCEL ☑EDD (DIGITAL)	R ☑Regular (Standard TAT if received by 3 pm - business days)
Contact:	Zenovia Craciunescu/Kerrie Serben	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	16820 107 Avenue Edmonton, Alberta, Canada T5P 4C3	☐Criteria on Report - provide details below if box checked	E ☐Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
Phone:	+1 780 930 6786/ +1 306 667 1531	Select Distribution: ☑EMAIL ☐MAIL ☐FAX	E2 ☐Same day or weekend emergency - contact ALS to confirm TAT and surcharge
		Email 1 or Fax mkeefe@sabinagoldsilver.com	Specify Date Required for E2,E or P:
		Email 2 zcraciunescu@golder.com; Kerrie_Serben@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:	Sabina Gold and Silver	Email 1 or Fax mkeefe@sabinagoldsilver.com
Contact:	Merle Keefe (604 998 4190) mkeefe@sabinagoldsilver.com	Email 2

Project Information		Oil and Gas Required Fields (client use)	
ALS Bottle Order	BR210169/ Quote: Q63297	Approver ID:	Cost Center:
Job #:	1787890/2300	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): L2147304 | **ALS Contact:** Jessica Spira | **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	GLD-CAL-WQ-MET-DU-ED	GLD-CAL-WQ-MET-TU-ED	GLD-CAL-WQ-NUT-ED	GLD-CAL-WQ-ROU-ED	HG-D-U-CVAF-VA	HG-T-U-CVAF-VA	N-T-CALC-ED	PO4-DO-L-COL-ED	SILICATE-L-COL-ED	Cyanides	Radium-226	Chlorophyll a		Number of Containers
19 29	BRP-32-4	Aug 13, 18	10:50	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	1		11
20 30	BRP-32-5	"	11:40	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			11
21 31	BRP-29-4	"	1300	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			11
22 32	BRP-QC-3	"	9:00	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			11
33				Water														
	Diss Hg and diss metals not filtered nor preserved in the field			Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														

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

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
10.5					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
Zenovia C.	Aug 13, 18	18:30		15/8	11:45			

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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.**

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here
(lab use only)

COC Number: 14 - Page 8 of 8

Report To		Report Format / Distribution	Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Golder Associates Ltd.	Select Report Format: ☑PDF ☑EXCEL ☑EDD (DIGITAL)	R ☑Regular (Standard TAT if received by 3 pm - business days)
Contact:	Zenovia Craciunescu/Kerrie Serben	Quality Control (QC) Report with Report ☑ Yes ☐ No	P ☐Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	16820 107 Avenue Edmonton, Alberta, Canada T5P 4C3	☐Criteria on Report - provide details below if box checked	E ☐Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
Phone:	+1 780 930 6786/ +1 306 667 1531	Select Distribution: ☑EMAIL ☐MAIL ☐FAX	E2 ☐Same day or weekend emergency - contact ALS to confirm TAT and surcharge
		Email 1 or Fax mkeefe@sabinagoldsilver.com	Specify Date Required for E2,E or P:
		Email 2 zcraciunescu@golder.com; Kerrie_Serben@golder.com	

Invoice To		Invoice Distribution	Analysis Request
	Same as Report To ☐ Yes ☑ No	Select Invoice Distribution: ☑EMAIL ☐MAIL ☐FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
	Copy of Invoice with Report ☐ Yes ☑ No	Email 1 or Fax mkeefe@sabinagoldsilver.com	
Company:	Sabina Gold and Silver	Email 2	
Contact:	Merle Keefe (604 998 4190) mkeefe@sabinagoldsilver.com		

Project Information		Oil and Gas Required Fields (client use)	
ALS Bottle Order	BR210169/ Quote: Q63297	Approver ID:	Cost Center:
Job #:	1787890/2300	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): L2147304 **ALS Contact:** Jessica Spira **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	GLD-CAL-WQ-MET-DU-ED	GLD-CAL-WQ-MET-TU-ED	GLD-CAL-WQ-NUT-ED	GLD-CAL-WQ-ROU-ED	HG-D-U-CVAF-VA	HG-T-U-CVAF-VA	N-T-CALC-ED	PO4-DO-L-COL-ED	SILICATE-L-COL-ED	Cyanides	Radium-226	Chlorophyll a		Number of Containers
23 61	BRP-32-1	Aug 13, 18	8:45	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			1
24 62	BRP-32-2	"	9:30	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			1
25 63	BRP-32-3	"	10:10	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			1
26 64	BRP-QC-2	"	8:45	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			1
4				Water														
	Diss Hg and diss. metals not filtered nor preserved in the field			Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														
				Water														

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

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

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

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

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

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

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
9.9					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
Zenovia C	Aug 13, 18	18:30	OG	15/8	11:45			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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

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

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

[redacted]

GOLDER ASSOCIATES LTD
ATTN: Zenovia Craciunescu / Kerrie Serbin
16820 107 Ave NW
EDMONTON AB T5P 4C3

Date Received: 12-SEP-18
Report Date: 17-OCT-18 16:35 (MT)
Version: FINAL

Client Phone: 780-930-6786

Certificate of Analysis

Lab Work Order #: L2162579

Project P.O. #: NOT SUBMITTED
Job Reference: 1787890/2300
C of C Numbers:
Legal Site Desc:

[redacted]

[redacted]PL

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

[redacted]

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2162579-1 BRP-29-1							
Sampled By: CLIENT on 07-SEP-18 @ 15:30							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.00868		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	0.000222		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.0106		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	0.0021		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	0.0000120		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	5.72		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	0.000735		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00135		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0047		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00141		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	3.06		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.00559		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000298		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.00639		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.525		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	1.05		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.0300		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	0.000138		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	0.000061		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	0.00200		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	0.671		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	4.46		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	0.000061		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0163		0.00030	mg/L		26-SEP-18	R4250171
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		26-SEP-18	R4250171
Arsenic (As)-Total	0.000189		0.000020	mg/L		26-SEP-18	R4250171
Barium (Ba)-Total	0.00982		0.000050	mg/L		26-SEP-18	R4250171
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4250171
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4250171
Boron (B)-Total	0.0010		0.0010	mg/L		26-SEP-18	R4250171
Cadmium (Cd)-Total	0.0000121		0.0000050	mg/L		26-SEP-18	R4250171
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		26-SEP-18	R4250171
Cobalt (Co)-Total	0.000743		0.000010	mg/L		26-SEP-18	R4250171
Copper (Cu)-Total	0.00169		0.00010	mg/L		26-SEP-18	R4250171
Iron (Fe)-Total	0.0221		0.0010	mg/L		26-SEP-18	R4250171
Lead (Pb)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4250171
Lithium (Li)-Total	0.00118		0.00050	mg/L		26-SEP-18	R4250171

* 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
L2162579-1 BRP-29-1							
Sampled By: CLIENT on 07-SEP-18 @ 15:30							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Manganese (Mn)-Total	0.00558		0.000050	mg/L		26-SEP-18	R4250171
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-SEP-18	R4250171
Nickel (Ni)-Total	0.00608		0.000060	mg/L		26-SEP-18	R4250171
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-SEP-18	R4250171
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-SEP-18	R4250171
Strontium (Sr)-Total	0.0310		0.000050	mg/L		26-SEP-18	R4250171
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-SEP-18	R4250171
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-SEP-18	R4250171
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		26-SEP-18	R4250171
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4250171
Vanadium (V)-Total	0.000091		0.000050	mg/L		26-SEP-18	R4250171
Zinc (Zn)-Total	0.00212		0.00080	mg/L		26-SEP-18	R4250171
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.66		0.10	mg/L		26-SEP-18	R4244192
Sulfur (S)-Total	4.14		0.50	mg/L		26-SEP-18	R4244192
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		26-SEP-18	R4244192
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0090		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.190		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0019		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	0.0022		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	7.05		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	5.2		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	26.9		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	31.7			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0362		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	0.0065		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	11.5		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	48		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.38		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	6.56		0.10	pH		14-SEP-18	R4216074

* 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
L2162579-1 BRP-29-1							
Sampled By: CLIENT on 07-SEP-18 @ 15:30							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Conductivity (EC)	66.4		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	5.2		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	4.3		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	3.46		0.50	mg/L		01-OCT-18	R4258412
Cyanide, Free	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Ra-226	<0.0065		0.0065	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	1.49	DLHC	0.050	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Mercury (Hg)-Total	<0.00061	RRR	0.00061	ug/L		26-SEP-18	R4244193
Total Nitrogen	0.233		0.050	mg/L		05-OCT-18	
Total Organic Carbon	3.30		0.50	mg/L		03-OCT-18	R4259820
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-2 BRP-29-2							
Sampled By: CLIENT on 07-SEP-18 @ 14:30							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.00570		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	0.000225		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.00978		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	0.0015		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	0.0000094		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	4.97		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	0.000371		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00121		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0058		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00126		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	2.73		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.00379		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000273		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.00487		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.497		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	1.02		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.0258		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	0.000086		0.000050	mg/L		25-SEP-18	R4244190

* 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
L2162579-2 BRP-29-2							
Sampled By: CLIENT on 07-SEP-18 @ 14:30							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	0.000055		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	0.00136		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	0.547		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	3.93		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0124		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	0.000224		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	0.00825		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	0.0017		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	0.0000096		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	0.000415		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	0.00153		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	0.0250		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	0.00115		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	0.00412		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Nickel (Ni)-Total	0.00496		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	0.0260		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	0.00126		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.53		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	3.76		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0105		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.180		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0018		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	0.0088		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							

* 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
L2162579-2 BRP-29-2							
Sampled By: CLIENT on 07-SEP-18 @ 14:30							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	5.57		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	4.6		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	23.7		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	26.5			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0171		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	8.96		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	49		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.41		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	6.59		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	59.3		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	5.5		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	4.5		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	3.69		0.50	mg/L		01-OCT-18	R4258412
Cyanide, Free	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Ra-226	<0.0088		0.0088	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	1.12	DLHC	0.050	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Mercury (Hg)-Total	<0.00058	RRR	0.00058	ug/L		26-SEP-18	R4244193
Total Nitrogen	0.197		0.050	mg/L		05-OCT-18	
Total Organic Carbon	3.71		0.50	mg/L		01-OCT-18	R4258412
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-3 BRP-29-3							
Sampled By: CLIENT on 07-SEP-18 @ 14:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.00854		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190

* 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
L2162579-3 BRP-29-3							
Sampled By: CLIENT on 07-SEP-18 @ 14:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Arsenic (As)-Dissolved	0.000221		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.00894		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	0.0015		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	0.0000122		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	5.42		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	0.000063		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	0.000581		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00128		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0048		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00134		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	2.95		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.00496		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000258		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.00586		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.509		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	0.979		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.0287		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	0.000189		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	0.000054		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	0.00159		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	0.625		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	4.25		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0144		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	0.000229		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	0.00882		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	0.0017		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	0.0000115		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	0.000612		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	0.00156		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	0.0189		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	0.00110		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	0.00500		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307

* 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
L2162579-3 BRP-29-3							
Sampled By: CLIENT on 07-SEP-18 @ 14:00							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Nickel (Ni)-Total	0.00560		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	0.0293		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	0.00159		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.64		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	3.90		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0608		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.198		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0025		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	0.0028		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	6.40		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	4.1		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	25.7		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	28.4			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0282		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	9.40		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	46		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.40		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	6.59		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	64.6		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	5.4		5.0	mg/L		14-SEP-18	R4216074

* 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
L2162579-3 BRP-29-3							
Sampled By: CLIENT on 07-SEP-18 @ 14:00							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	4.4		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	3.55		0.50	mg/L		01-OCT-18	R4258412
Cyanide, Free	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Ra-226	<0.0075		0.0075	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	1.31	DLHC	0.050	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Mercury (Hg)-Total	<0.00060	RRR	0.00060	ug/L		26-SEP-18	R4244193
Total Nitrogen	0.226		0.050	mg/L		05-OCT-18	
Total Organic Carbon	3.68		0.50	mg/L		01-OCT-18	R4258412
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-4 BRP-29-4							
Sampled By: CLIENT on 07-SEP-18 @ 12:15							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.00728		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	0.000044		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	0.000203		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.00865		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	0.0014		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	0.0000117		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	5.12		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	0.000470		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00120		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0038		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00124		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	2.89		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.00411		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000310		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.00533		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.508		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	0.973		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.0269		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	0.000072		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190

* 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
L2162579-4 BRP-29-4							
Sampled By: CLIENT on 07-SEP-18 @ 12:15							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Vanadium (V)-Dissolved	0.000058		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	0.00157		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	0.571		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	4.03		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0145		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	0.000021		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	0.000225		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	0.00858		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	0.0016		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	0.0000121		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	0.000504		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	0.00155		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	0.0212		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	0.000014		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	0.00102		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	0.00443		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Nickel (Ni)-Total	0.00520		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	0.0269		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	0.00139		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.57		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	3.80		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0099		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.272		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0045		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	0.0034		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	5.87		0.50	mg/L		13-SEP-18	R4216859
Color, True							

* 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
L2162579-4 BRP-29-4							
Sampled By: CLIENT on 07-SEP-18 @ 12:15							
Matrix: WATER							
Color, True							
Color, True	4.4		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	24.7		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	27.4			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0222		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	9.22		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	0.0023		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	43		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.44		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	6.59		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	62.0		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	5.5		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	4.5		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	4.16		0.50	mg/L		01-OCT-18	R4258412
Cyanide, Free	<0.0050		0.0050	mg/L		20-SEP-18	R4233068
Ra-226	0.011		0.0061	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	1.24	DLHC	0.050	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		20-SEP-18	R4233068
Mercury (Hg)-Total	<0.00060	RRR	0.00060	ug/L		26-SEP-18	R4244193
Total Nitrogen	0.294		0.050	mg/L		05-OCT-18	
Total Organic Carbon	4.00		0.50	mg/L		01-OCT-18	R4258412
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		20-SEP-18	R4233068
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-5 BRP-29-5							
Sampled By: CLIENT on 07-SEP-18 @ 13:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.00634		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	0.000225		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.00859		0.000050	mg/L		25-SEP-18	R4244190

* 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
L2162579-5 BRP-29-5							
Sampled By: CLIENT on 07-SEP-18 @ 13:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	0.0014		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	0.0000074		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	4.99		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	0.000391		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00126		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0049		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00116		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	2.82		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.00357		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000257		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.00505		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.501		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	1.01		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.0259		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	0.000317		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	0.000058		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	0.00122		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	0.541		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	3.93		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0123		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	0.000237		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	0.00853		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	0.0015		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	0.0000109		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	0.000416		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	0.00151		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	0.0199		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	0.00098		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	0.00421		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Nickel (Ni)-Total	0.00481		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307

* 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
L2162579-5 BRP-29-5							
Sampled By: CLIENT on 07-SEP-18 @ 13:00							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	0.0270		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	0.00139		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.53		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	3.58		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0197		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.131		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0036		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	0.0027		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	5.64		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	4.2		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	24.1		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	26.7			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0190		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	9.10		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	0.0023		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	50		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.48		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	6.55		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	59.8		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	5.2		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074

* 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
L2162579-5 BRP-29-5							
Sampled By: CLIENT on 07-SEP-18 @ 13:00							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Alkalinity, Total (as CaCO3)	4.3		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	3.78		0.50	mg/L		01-OCT-18	R4258412
Cyanide, Free	<0.0050		0.0050	mg/L		20-SEP-18	R4233068
Ra-226	<0.0082		0.0082	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	1.14	DLHC	0.050	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		20-SEP-18	R4233068
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		26-SEP-18	R4244193
Total Nitrogen	0.150		0.050	mg/L		05-OCT-18	
Total Organic Carbon	3.73		0.50	mg/L		01-OCT-18	R4258412
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		20-SEP-18	R4233068
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-6 BRP-29-6							
Sampled By: CLIENT on 07-SEP-18 @ 17:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.00667		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	0.000029		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	0.000224		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.00835		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	0.0013		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	0.0000083		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	5.07		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	0.000425		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00133		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0055		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00126		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	2.83		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.00398		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000249		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.00522		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.498		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	1.01		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.0267		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	0.000483		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	0.000051		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	0.00139		0.00080	mg/L		25-SEP-18	R4244190

* 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
L2162579-6 BRP-29-6							
Sampled By: CLIENT on 07-SEP-18 @ 17:00							
Matrix: WATER							
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	0.560		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	4.11		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0128		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	0.000212		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	0.00832		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	0.0015		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	0.0000096		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	0.000472		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	0.00154		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	0.0204		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	0.00103		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	0.00424		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Nickel (Ni)-Total	0.00501		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	0.0272		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	0.00123		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.55		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	3.66		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0149		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.169		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0017		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	0.0031		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	5.85		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	4.2		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859

* 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
L2162579-6 BRP-29-6							
Sampled By: CLIENT on 07-SEP-18 @ 17:00							
Matrix: WATER							
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	24.3		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	27.2			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0201		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	9.35		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	45		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.44		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	6.59		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	61.5		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	5.0		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	4.1		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	3.60		0.50	mg/L		01-OCT-18	R4258412
Cyanide, Free	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Ra-226	<0.0055		0.0055	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	1.30	DLHC	0.050	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Mercury (Hg)-Total	<0.00055	RRR	0.00055	ug/L		26-SEP-18	R4244193
Total Nitrogen	0.189		0.050	mg/L		05-OCT-18	
Total Organic Carbon	3.72		0.50	mg/L		01-OCT-18	R4258412
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-7 BRP-40-1							
Sampled By: CLIENT on 08-SEP-18 @ 13:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.00166		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	0.000163		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.00266		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190

* 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
L2162579-7 BRP-40-1							
Sampled By: CLIENT on 08-SEP-18 @ 13:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Calcium (Ca)-Dissolved	1.86		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	0.000023		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00037		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0126		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00069		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	1.78		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.000514		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000611		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.000675		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.372		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	0.651		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.00633		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	0.328		0.050	mg/L		29-SEP-18	R4251942
Silicon (Si)-Dissolved	0.323		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	1.77	DTC	0.50	mg/L		29-SEP-18	R4251942
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		29-SEP-18	R4251942
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00103		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	0.000148		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	0.00217		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	<0.0010		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	0.000013		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	0.00039		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	0.0088		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	0.00058		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	0.000291		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	0.00156		0.000050	mg/L		24-SEP-18	R4239307
Nickel (Ni)-Total	0.000542		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	0.00640		0.000050	mg/L		24-SEP-18	R4239307

* 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
L2162579-7 BRP-40-1							
Sampled By: CLIENT on 08-SEP-18 @ 13:00							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.22		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	0.57		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0103		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.168		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0024		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	0.0044		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	<2.0		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	12.0		0.053	mg/L		30-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	12.7			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	4.27		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	23		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.54		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	6.76		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	29.0		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	7.7		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	6.3		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							

* 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
L2162579-7 BRP-40-1							
Sampled By: CLIENT on 08-SEP-18 @ 13:00							
Matrix: WATER							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	3.48		0.50	mg/L		01-OCT-18	R4258412
Cyanide, Free	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Ra-226	<0.0057		0.0057	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	0.693	DLHC	0.050	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		26-SEP-18	R4244193
Total Nitrogen	0.168		0.050	mg/L		05-OCT-18	
Total Organic Carbon	3.61		0.50	mg/L		01-OCT-18	R4258412
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-8 BRP-40-2							
Sampled By: CLIENT on 08-SEP-18 @ 12:30							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.00146		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	0.000033		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	0.000166		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.00285		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	1.89		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	0.000028		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00039		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0130		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00074		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	1.79		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.000588		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000549		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.000698		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.366		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	0.670		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.00654		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	0.000169		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	0.326		0.050	mg/L		25-SEP-18	R4244190

* 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
L2162579-8 BRP-40-2							
Sampled By: CLIENT on 08-SEP-18 @ 12:30							
Matrix: WATER							
Dissolved Metals in Water by CRC ICPMS							
Sulfur (S)-Dissolved	1.90		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00288		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	0.000156		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	0.00289		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	<0.0010		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	0.000033		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	0.00051		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	0.0322		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	0.00063		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	0.000966		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Nickel (Ni)-Total	0.000744		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	0.00671		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.32		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	1.70		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0074		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.177		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0046		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	0.0036		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	<2.0		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	12.1		0.053	mg/L		29-SEP-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
L2162579-8 BRP-40-2							
Sampled By: CLIENT on 08-SEP-18 @ 12:30							
Matrix: WATER							
Ion Balance Calculation							
TDS (Calculated)	12.4			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	4.13		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	0.0019		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	21		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.49		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	6.79		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	28.5		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	7.3		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	6.0		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	3.55		0.50	mg/L		01-OCT-18	R4258412
Cyanide, Free	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Ra-226	<0.0066		0.0066	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	0.710	DLHC	0.050	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		26-SEP-18	R4244193
Total Nitrogen	0.177		0.050	mg/L		05-OCT-18	
Total Organic Carbon	3.40		0.50	mg/L		01-OCT-18	R4258412
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-9 BRP-40-3							
Sampled By: CLIENT on 08-SEP-18 @ 12:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.00144		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	0.000146		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.00265		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	1.89		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190

* 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
L2162579-9 BRP-40-3							
Sampled By: CLIENT on 08-SEP-18 @ 12:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Cobalt (Co)-Dissolved	0.000023		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00036		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0129		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00069		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	1.78		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.000504		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000478		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.000657		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.365		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	0.651		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.00634		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	0.000080		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	0.324		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	1.81		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00340		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	0.000153		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	0.00290		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	<0.0010		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	0.000030		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	0.00049		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	0.0343		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	0.00065		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	0.00100		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Nickel (Ni)-Total	0.000731		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	0.00670		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307

* 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
L2162579-9 BRP-40-3							
Sampled By: CLIENT on 08-SEP-18 @ 12:00							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Vanadium (V)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.37		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	2.15		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0177		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.200		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0021		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	0.0035		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	<2.0		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	12.1		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	12.5			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	4.06		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	20		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.57		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	6.79		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	28.3		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	7.6		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	6.2		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	3.04		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Free	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Ra-226	<0.0087		0.0087	Bq/L	03-OCT-18	15-OCT-18	R4252755

* 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
L2162579-9 BRP-40-3							
Sampled By: CLIENT on 08-SEP-18 @ 12:00							
Matrix: WATER							
Silicate (as SiO2)	0.697	DLHC	0.050	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		26-SEP-18	R4244193
Total Nitrogen	0.200		0.050	mg/L		05-OCT-18	
Total Organic Carbon	3.16		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-10 BRP-40-4							
Sampled By: CLIENT on 08-SEP-18 @ 11:15							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.00172		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	0.000030		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	0.000174		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.00267		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	1.87		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	0.000025		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00038		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0128		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00072		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	1.82		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.000613		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000690		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.000699		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.383		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	0.691		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.00629		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	0.000080		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	0.340		0.050	mg/L		29-SEP-18	R4251942
Silicon (Si)-Dissolved	0.381		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	2.00		0.50	mg/L		29-SEP-18	R4251942
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		29-SEP-18	R4251942
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							

* 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
L2162579-10 BRP-40-4							
Sampled By: CLIENT on 08-SEP-18 @ 11:15							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00455		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	0.000163		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	0.00313		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	<0.0010		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	0.000032		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	0.00049		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	0.0304		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	0.00060		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	0.000903		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Nickel (Ni)-Total	0.000692		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	0.00659		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.31		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	1.63		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0078		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.256		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0022		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	0.0038		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	<2.0		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	12.2		0.053	mg/L		30-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	12.5			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		13-SEP-18	R4216859

* 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
L2162579-10 BRP-40-4							
Sampled By: CLIENT on 08-SEP-18 @ 11:15							
Matrix: WATER							
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	4.05		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	26		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.42		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	6.76		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	28.4		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	7.6		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	6.2		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	3.05		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Free	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Ra-226	<0.0065		0.0065	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	0.685	DLHC	0.050	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		26-SEP-18	R4244193
Total Nitrogen	0.256		0.050	mg/L		05-OCT-18	
Total Organic Carbon	3.14		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-11 BRP-40-5							
Sampled By: CLIENT on 08-SEP-18 @ 10:45							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.00094		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	0.000027		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	0.000165		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.00314		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	1.85		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	0.000018		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00035		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0121		0.0010	mg/L		25-SEP-18	R4244190

* 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
L2162579-11 BRP-40-5							
Sampled By: CLIENT on 08-SEP-18 @ 10:45							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00072		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	1.73		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.000501		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000443		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.000628		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.357		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	0.635		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.00616		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	0.000135		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	0.324		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	1.78		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00517		0.00030	mg/L		26-SEP-18	R4250171
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		26-SEP-18	R4250171
Arsenic (As)-Total	0.000144		0.000020	mg/L		26-SEP-18	R4250171
Barium (Ba)-Total	0.00290		0.000050	mg/L		26-SEP-18	R4250171
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4250171
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4250171
Boron (B)-Total	<0.0010		0.0010	mg/L		26-SEP-18	R4250171
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		26-SEP-18	R4250171
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		26-SEP-18	R4250171
Cobalt (Co)-Total	0.000028		0.000010	mg/L		26-SEP-18	R4250171
Copper (Cu)-Total	0.00051		0.00010	mg/L		26-SEP-18	R4250171
Iron (Fe)-Total	0.0358		0.0010	mg/L		26-SEP-18	R4250171
Lead (Pb)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4250171
Lithium (Li)-Total	0.00053		0.00050	mg/L		26-SEP-18	R4250171
Manganese (Mn)-Total	0.000821		0.000050	mg/L		26-SEP-18	R4250171
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		26-SEP-18	R4250171
Nickel (Ni)-Total	0.000592		0.000060	mg/L		26-SEP-18	R4250171
Selenium (Se)-Total	<0.000040		0.000040	mg/L		26-SEP-18	R4250171
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		26-SEP-18	R4250171
Strontium (Sr)-Total	0.00651		0.000050	mg/L		26-SEP-18	R4250171
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		26-SEP-18	R4250171
Tin (Sn)-Total	<0.000050		0.000050	mg/L		26-SEP-18	R4250171
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		26-SEP-18	R4250171
Uranium (U)-Total	<0.000010		0.000010	mg/L		26-SEP-18	R4250171
Vanadium (V)-Total	0.000064		0.000050	mg/L		26-SEP-18	R4250171
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		26-SEP-18	R4250171
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.31		0.10	mg/L		26-SEP-18	R4244192

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2162579-11 BRP-40-5							
Sampled By: CLIENT on 08-SEP-18 @ 10:45							
Matrix: WATER							
Total Metals in Water by CRC ICPMS							
Sulfur (S)-Total	1.82		0.50	mg/L		26-SEP-18	R4244192
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		26-SEP-18	R4244192
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0144		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.297		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0026		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	0.0044		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	2.6		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	11.7		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	12.4			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	4.12		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	0.0024	RRV	0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	21		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.47		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	6.77		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	28.4		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	7.4		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	6.1		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	2.99		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Free	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Ra-226	<0.0067		0.0067	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	0.685	DLHC	0.050	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		26-SEP-18	R4244193

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2162579-11 BRP-40-5							
Sampled By: CLIENT on 08-SEP-18 @ 10:45							
Matrix: WATER							
Total Nitrogen	0.297		0.050	mg/L		05-OCT-18	
Total Organic Carbon	3.03		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-12 FB-L							
Sampled By: CLIENT on 08-SEP-18 @ 12:20							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	<0.00030		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.000405		0.000050	mg/L		28-SEP-18	R4251701
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	<0.020		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	0.0079		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		28-SEP-18	R4251701
Nickel (Ni)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.032		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	0.0282		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.000102		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	0.000101		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	<0.050		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	<0.50		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	<0.00030		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	0.000401		0.000050	mg/L		28-SEP-18	R4251701

* 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
L2162579-12 FB-L							
Sampled By: CLIENT on 08-SEP-18 @ 12:20							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	<0.0010		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	<0.0010		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	<0.00050		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		28-SEP-18	R4251701
Nickel (Ni)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	<0.10		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	<0.50		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.165		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	<0.0010		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	<0.0010		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	<2.0		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	<0.053		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	<1.0			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	<0.050		0.050	mg/L		13-SEP-18	R4216859

* 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
L2162579-12 FB-L							
Sampled By: CLIENT on 08-SEP-18 @ 12:20							
Matrix: WATER							
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	<10		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.13		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	5.05		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	<2.0		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	<0.50		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Free	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Ra-226	<0.0055		0.0055	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	<0.010		0.010	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		26-SEP-18	R4244193
Total Nitrogen	0.165		0.050	mg/L		05-OCT-18	
Total Organic Carbon	<0.50		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.0010	RRR	0.0010	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-13 FB-S							
Sampled By: CLIENT on 09-SEP-18 @ 12:05							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	<0.00030		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	<0.020		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	0.0128		0.0040	mg/L		28-SEP-18	R4251701
Manganese (Mn)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190

* 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
L2162579-13 FB-S							
Sampled By: CLIENT on 09-SEP-18 @ 12:05							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		28-SEP-18	R4251701
Nickel (Ni)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	<0.020		0.020	mg/L		28-SEP-18	R4251701
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	0.0216		0.0050	mg/L		28-SEP-18	R4251701
Strontium (Sr)-Dissolved	0.000116		0.000050	mg/L		28-SEP-18	R4251701
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	0.000105		0.000050	mg/L		28-SEP-18	R4251701
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	<0.050		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	<0.50		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00073		0.00030	mg/L		26-SEP-18	R4250171
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	<0.0010		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	<0.0010		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	<0.00050		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Nickel (Ni)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	<0.10		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	<0.50		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							

* 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
L2162579-13 FB-S							
Sampled By: CLIENT on 09-SEP-18 @ 12:05							
Matrix: WATER							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.050		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	<0.0010		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	<0.0010		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	<2.0		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	<0.053		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	<1.0			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	<0.050		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	<10		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.13		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	4.95		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	<2.0		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	<0.50		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Free	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Ra-226	<0.0051		0.0051	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	<0.010		0.010	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Mercury (Hg)-Total	<0.00075	RRR	0.00075	ug/L		26-SEP-18	R4244193
Total Nitrogen	<0.050		0.050	mg/L		05-OCT-18	
Total Organic Carbon	<0.50		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Diss. Mercury in Water by CVAFS (Ultra)							

* 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
L2162579-13 FB-S							
Sampled By: CLIENT on 09-SEP-18 @ 12:05							
Matrix: WATER							
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00060	RRR	0.00060	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-14 BRP-39 (1)							
Sampled By: CLIENT on 09-SEP-18 @ 12:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.00194		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	0.000176		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.00316		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	2.12		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	0.000046		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00040		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0352		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00079		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	1.98		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.00107		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000379		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.000892		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.364		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	0.661		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.00694		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	0.327		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	2.17		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0102		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	0.000220		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	0.00387		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	<0.0010		0.0010	mg/L		24-SEP-18	R4239307

* 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
L2162579-14 BRP-39 (1)							
Sampled By: CLIENT on 09-SEP-18 @ 12:00							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	0.000177		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	0.00063		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	0.155		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	0.000021		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	0.00067		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	0.00551		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Nickel (Ni)-Total	0.00107		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	0.00725		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	0.00027		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.33		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	1.87		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0130		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.418		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0028		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	0.0162		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	3.8		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	13.4		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	13.3			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	4.73		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							

* 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
L2162579-14 BRP-39 (1)							
Sampled By: CLIENT on 09-SEP-18 @ 12:00							
Matrix: WATER							
Total Dissolved Solids							
Total Dissolved Solids	23		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	7.7		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	1.89		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	6.82		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	31.1		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	7.0		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	5.7		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	3.10		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Free	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Ra-226	<0.0086		0.0086	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	0.695	DLHC	0.050	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		26-SEP-18	R4244193
Total Nitrogen	0.418		0.050	mg/L		05-OCT-18	
Total Organic Carbon	4.91		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-15 BRP-39 (2)							
Sampled By: CLIENT on 09-SEP-18 @ 12:20							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.00236		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	0.000167		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.00306		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	2.11		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	0.000058		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00039		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0326		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00080		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	1.97		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.00110		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000406		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.000977		0.000060	mg/L		25-SEP-18	R4244190

* 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
L2162579-15 BRP-39 (2)							
Sampled By: CLIENT on 09-SEP-18 @ 12:20							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Potassium (K)-Dissolved	0.360		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	0.661		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.00688		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	0.000064		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	0.000057		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	0.337		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	2.18		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0795		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	0.000464		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	0.00602		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	<0.0010		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	0.0000090		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	0.000127		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	0.000339		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	0.00147		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	0.711		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	0.000161		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	0.00060		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	0.00984		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Nickel (Ni)-Total	0.00202		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	0.00774		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	0.00224		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	0.000019		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	0.000379		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	0.00093		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.36		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	1.86		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0183		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							

* 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
L2162579-15 BRP-39 (2)							
Sampled By: CLIENT on 09-SEP-18 @ 12:20							
Matrix: WATER							
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.701		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0032		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	0.0116		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	4.8		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	13.4		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	13.8			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	4.96		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	24		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	51.4		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	7.79		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	6.75		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	31.7		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	7.7		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	6.3		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	2.99		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Free	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Ra-226	<0.010	DLRC	0.010	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	0.718	DLHC	0.050	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Mercury (Hg)-Total	<0.0025	RRR	0.0025	ug/L		26-SEP-18	R4244193
Total Nitrogen	0.701		0.050	mg/L		05-OCT-18	
Total Organic Carbon	4.2	DLM	2.5	mg/L		01-OCT-18	R4258552
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	26-SEP-18	27-SEP-18	R4248829

* 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
L2162579-15 BRP-39 (2)							
Sampled By: CLIENT on 09-SEP-18 @ 12:20							
Matrix: WATER							
L2162579-16 BRP-34 (1)							
Sampled By: CLIENT on 09-SEP-18 @ 13:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.00267		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	0.000191		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.00461		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	1.75		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	0.000063		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00084		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0116		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00086		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	2.16		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.00136		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000150		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.00229		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.425		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	0.779		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.00830		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	0.000057		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	0.176		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	3.26		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00649		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	0.000205		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	0.00532		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	<0.0010		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	0.000093		0.000010	mg/L		24-SEP-18	R4239307

* 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
L2162579-16 BRP-34 (1)							
Sampled By: CLIENT on 09-SEP-18 @ 13:00							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Copper (Cu)-Total	0.00112		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	0.0317		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	0.00072		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	0.00206		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Nickel (Ni)-Total	0.00259		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	0.0150		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.17		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	2.85		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.156		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0016		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	0.0032		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	2.22		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	4.0		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	13.3		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	16.7			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	7.00		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	26		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349

* 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
L2162579-16 BRP-34 (1)							
Sampled By: CLIENT on 09-SEP-18 @ 13:00							
Matrix: WATER							
Turbidity							
Turbidity	0.38		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	6.60		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	41.1		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	4.0		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	3.75		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Free	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Ra-226	<0.0057		0.0057	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	0.389		0.010	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		26-SEP-18	R4244193
Total Nitrogen	0.156		0.050	mg/L		05-OCT-18	
Total Organic Carbon	3.50		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-17 BRP-34 (2)							
Sampled By: CLIENT on 09-SEP-18 @ 13:15							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.00272		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	0.000175		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.00480		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	3.10		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	0.000054		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00082		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0097		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00096		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	2.14		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.00112		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000238		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.00239		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.418		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	0.776		0.0050	mg/L		25-SEP-18	R4244190

* 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
L2162579-17 BRP-34 (2)							
Sampled By: CLIENT on 09-SEP-18 @ 13:15							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Strontium (Sr)-Dissolved	0.0148		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	0.000059		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	0.181		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	3.15		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.00622		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	0.000191		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	0.00485		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	<0.0010		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	0.000092		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	0.00110		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	0.0343		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	0.00082		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	0.00226		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Nickel (Ni)-Total	0.00239		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	0.0148		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.17		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	2.80		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0050		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.187		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0023		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							

* 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
L2162579-17 BRP-34 (2)							
Sampled By: CLIENT on 09-SEP-18 @ 13:15							
Matrix: WATER							
Total P in Water by Colour							
Phosphorus (P)-Total	0.0059		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	2.26		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	3.6		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	16.6		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	18.2			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	7.14		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	32		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.36		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	6.61		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	40.9		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	4.0		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	3.38		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Free	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Ra-226	<0.0080		0.0080	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	0.365		0.010	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Mercury (Hg)-Total	<0.00050		0.00050	ug/L		21-SEP-18	R4232461
Total Nitrogen	0.187		0.050	mg/L		05-OCT-18	
Total Organic Carbon	3.48		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		24-SEP-18	R4239379
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-18 BRP-19							
Sampled By: CLIENT on 09-SEP-18 @ 14:20							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							

* 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
L2162579-18 BRP-19							
Sampled By: CLIENT on 09-SEP-18 @ 14:20							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.0771		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	0.000331		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.0310		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	0.000011		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	0.0010		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	0.0000219		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	9.37		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	0.000348		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	0.00329		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00150		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0625		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00180		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	6.24		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.0228		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000089		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.00856		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.427		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	1.88		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.0553		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	0.000091		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	0.00018		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	0.000122		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	0.00392		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	2.73		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	8.56		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	0.000261		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0918		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	0.000026		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	0.000327		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	0.0316		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	0.000011		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	0.0012		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	0.0000220		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	0.000357		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	0.00323		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	0.00163		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	0.128		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	0.00164		0.00050	mg/L		24-SEP-18	R4239307

* 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
L2162579-18 BRP-19							
Sampled By: CLIENT on 09-SEP-18 @ 14:20							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Manganese (Mn)-Total	0.0224		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Nickel (Ni)-Total	0.00809		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	0.0632		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	0.00029		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	0.000123		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	0.00417		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	2.78		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	7.65		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	0.000253		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0169		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.388		0.050	mg/L	03-OCT-18	04-OCT-18	R4259914
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0025		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	0.0040		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	16.1		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	24.2		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	49.1		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	55.3			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	21.3		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	104		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.37		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	5.64		0.10	pH		14-SEP-18	R4216074

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2162579-18 BRP-19							
Sampled By: CLIENT on 09-SEP-18 @ 14:20							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Conductivity (EC)	123		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	8.85		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Free	<0.0050		0.0050	mg/L		25-SEP-18	R4241413
Ra-226	0.0057		0.0057	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	6.1		1.0	mg/L		15-SEP-18	R4217048
Cyanide, Total	<0.0050		0.0050	mg/L		25-SEP-18	R4241413
Mercury (Hg)-Total	<0.0015	RRR	0.0015	ug/L		21-SEP-18	R4232461
Total Nitrogen	0.388		0.050	mg/L		05-OCT-18	
Total Organic Carbon	9.67		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		25-SEP-18	R4241413
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.0013	RRR	0.0013	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-19 BRP-18							
Sampled By: CLIENT on 09-SEP-18 @ 13:35							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.0106		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	0.000216		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.0107		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	0.0013		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	0.0000118		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	6.02		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	0.000311		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00124		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0011		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00102		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	3.51		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.000761		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000115		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.00620		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.550		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	1.13		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.0309		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190

* 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
L2162579-19 BRP-18							
Sampled By: CLIENT on 09-SEP-18 @ 13:35							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	0.000051		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	0.00181		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	1.19		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	6.01		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	0.000091		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.0151		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	0.000196		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	0.0110		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	0.0014		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	0.0000152		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	0.000076		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	0.000307		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	0.00163		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	0.0038		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	0.00093		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	0.000742		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Nickel (Ni)-Total	0.00583		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	0.0319		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	0.00208		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	1.21		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	5.50		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	0.000067		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.058		0.050	mg/L	04-OCT-18	05-OCT-18	R4263035
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0015		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	0.0011		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							

* 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
L2162579-19 BRP-18							
Sampled By: CLIENT on 09-SEP-18 @ 13:35							
Matrix: WATER							
Chloride in Water by IC							
Chloride (Cl)	5.16		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	2.7		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	29.5		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	34.7			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.113		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	15.2		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	53		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.19		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	6.62		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	72.7		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	5.2		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	4.3		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	2.71		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Free	<0.0050		0.0050	mg/L		25-SEP-18	R4241413
Ra-226	<0.0077		0.0077	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	2.8		1.0	mg/L		15-SEP-18	R4217048
Cyanide, Total	<0.0050		0.0050	mg/L		25-SEP-18	R4241413
Mercury (Hg)-Total	<0.00075	RRR	0.00075	ug/L		21-SEP-18	R4232461
Total Nitrogen	0.170		0.050	mg/L		05-OCT-18	
Total Organic Carbon	2.82		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		25-SEP-18	R4241413
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00080	RRR	0.00080	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-20 BRP-23							
Sampled By: CLIENT on 09-SEP-18 @ 14:00							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	0.0103		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190

* 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
L2162579-20 BRP-23							
Sampled By: CLIENT on 09-SEP-18 @ 14:00							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Arsenic (As)-Dissolved	0.000236		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	0.0152		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	0.0000065		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	6.50		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	0.000073		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	0.000682		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	0.00067		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	0.0698		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	0.00092		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	3.31		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	0.0108		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	0.000146		0.000050	mg/L		25-SEP-18	R4244190
Nickel (Ni)-Dissolved	0.00328		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.441		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	1.07		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	0.0267		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	0.000084		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	0.00093		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	0.509		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	4.30		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	0.118		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	0.000429		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	0.0171		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		29-SEP-18	R4251942
Boron (B)-Total	<0.0010		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	0.0000184		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	0.000290		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	0.00109		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	0.00182		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	0.613		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	0.000092		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	0.00093		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	0.0146		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307

* 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
L2162579-20 BRP-23							
Sampled By: CLIENT on 09-SEP-18 @ 14:00							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Nickel (Ni)-Total	0.00418		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	0.0273		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	0.00457		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	0.000016		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	0.000701		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	0.00216		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	0.56		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	3.93		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	0.000078		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	0.0158		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	0.634		0.050	mg/L	04-OCT-18	05-OCT-18	R4263035
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	0.0013		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	0.0185		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	9.18		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	8.9		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	29.9		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	33.4			mg/L		30-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	0.0061		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	10.4		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	59		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	13.6		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	3.93		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	6.60		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	73.9		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	5.0		5.0	mg/L		14-SEP-18	R4216074

* 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
L2162579-20 BRP-23							
Sampled By: CLIENT on 09-SEP-18 @ 14:00							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	4.1		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	4.14		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Free	<0.0050		0.0050	mg/L		25-SEP-18	R4241413
Ra-226	<0.0071		0.0071	Bq/L	03-OCT-18	15-OCT-18	R4252755
Silicate (as SiO2)	1.06	DLHC	0.050	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		25-SEP-18	R4241413
Mercury (Hg)-Total	<0.0014	RRR	0.0014	ug/L		21-SEP-18	R4232461
Total Nitrogen	0.640		0.050	mg/L		05-OCT-18	
Total Organic Carbon	4.50		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		25-SEP-18	R4241413
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4242994
Mercury (Hg)-Dissolved	<0.00050		0.00050	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-21 TB-S							
Sampled By: CLIENT on 09-SEP-18 @ 14:20							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	<0.00030		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	<0.020		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	<0.0040		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		28-SEP-18	R4251701
Nickel (Ni)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	0.026		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	0.0067		0.0050	mg/L		25-SEP-18	R4244190
Strontium (Sr)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190

* 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
L2162579-21 TB-S							
Sampled By: CLIENT on 09-SEP-18 @ 14:20							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	<0.050		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	<0.50		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	<0.00030		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	<0.0010		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	<0.0010		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	<0.00050		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Nickel (Ni)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	<0.10		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	<0.50		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.050		0.050	mg/L	04-OCT-18	05-OCT-18	R4263035
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	<0.0010		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	<0.0010		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		13-SEP-18	R4216859
Color, True							

* 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
L2162579-21 TB-S							
Sampled By: CLIENT on 09-SEP-18 @ 14:20							
Matrix: WATER							
Color, True							
Color, True	<2.0		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	<0.053		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	<1.0			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	<0.050		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	<10		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.22		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	5.02		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	<2.0		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	<0.50		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Free	<0.0050		0.0050	mg/L		25-SEP-18	R4241413
Ra-226	0.053		0.0060	Bq/L	04-OCT-18	10-OCT-18	R4252755
Silicate (as SiO2)	<0.010		0.010	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		25-SEP-18	R4241413
Mercury (Hg)-Total	<0.00090	RRR	0.00090	ug/L		21-SEP-18	R4232461
Total Nitrogen	<0.050		0.050	mg/L		05-OCT-18	
Total Organic Carbon	<0.50		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		25-SEP-18	R4241413
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4243008
Mercury (Hg)-Dissolved	<0.0011	RRR	0.0011	ug/L	26-SEP-18	27-SEP-18	R4248829
L2162579-22 TB-L							
Sampled By: CLIENT on 08-SEP-18 @ 12:35							
Matrix: WATER							
Dissolved Metals in Water for Golder Cgy							
Diss. Metals in Water by CRC ICPMS (Ult)							
Aluminum (Al)-Dissolved	<0.00030		0.00030	mg/L		25-SEP-18	R4244190
Antimony (Sb)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Arsenic (As)-Dissolved	<0.000020		0.000020	mg/L		25-SEP-18	R4244190
Barium (Ba)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190

* 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
L2162579-22 TB-L							
Sampled By: CLIENT on 08-SEP-18 @ 12:35							
Matrix: WATER							
Diss. Metals in Water by CRC ICPMS (Ult)							
Beryllium (Be)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Bismuth (Bi)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Boron (B)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Cadmium (Cd)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Calcium (Ca)-Dissolved	<0.020		0.020	mg/L		25-SEP-18	R4244190
Chromium (Cr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Cobalt (Co)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Copper (Cu)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Iron (Fe)-Dissolved	<0.0010		0.0010	mg/L		25-SEP-18	R4244190
Lead (Pb)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Lithium (Li)-Dissolved	<0.00050		0.00050	mg/L		25-SEP-18	R4244190
Magnesium (Mg)-Dissolved	<0.0040		0.0040	mg/L		25-SEP-18	R4244190
Manganese (Mn)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Molybdenum (Mo)-Dissolved	<0.000050		0.000050	mg/L		28-SEP-18	R4251701
Nickel (Ni)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Potassium (K)-Dissolved	<0.020		0.020	mg/L		25-SEP-18	R4244190
Selenium (Se)-Dissolved	<0.000040		0.000040	mg/L		25-SEP-18	R4244190
Silver (Ag)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Sodium (Na)-Dissolved	<0.0050		0.0050	mg/L		28-SEP-18	R4251701
Strontium (Sr)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Thallium (Tl)-Dissolved	<0.0000050		0.0000050	mg/L		25-SEP-18	R4244190
Tin (Sn)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Titanium (Ti)-Dissolved	<0.00010		0.00010	mg/L		25-SEP-18	R4244190
Uranium (U)-Dissolved	<0.000010		0.000010	mg/L		25-SEP-18	R4244190
Vanadium (V)-Dissolved	<0.000050		0.000050	mg/L		25-SEP-18	R4244190
Zinc (Zn)-Dissolved	<0.00080		0.00080	mg/L		25-SEP-18	R4244190
Dissolved Metals in Water by CRC ICPMS							
Dissolved Metals Filtration Location	FIELD					24-SEP-18	R4245628
Silicon (Si)-Dissolved	<0.050		0.050	mg/L		25-SEP-18	R4244190
Sulfur (S)-Dissolved	<0.50		0.50	mg/L		25-SEP-18	R4244190
Zirconium (Zr)-Dissolved	<0.000060		0.000060	mg/L		25-SEP-18	R4244190
Total Metals in Water for Golder Cgy							
Metals in Water by CRC ICPMS (No Digest)							
Aluminum (Al)-Total	<0.00030		0.00030	mg/L		24-SEP-18	R4239307
Antimony (Sb)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Arsenic (As)-Total	<0.000020		0.000020	mg/L		24-SEP-18	R4239307
Barium (Ba)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Beryllium (Be)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Bismuth (Bi)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Boron (B)-Total	<0.0010		0.0010	mg/L		24-SEP-18	R4239307
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Chromium (Cr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Cobalt (Co)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Copper (Cu)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Iron (Fe)-Total	<0.0010		0.0010	mg/L		24-SEP-18	R4239307
Lead (Pb)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Lithium (Li)-Total	<0.00050		0.00050	mg/L		24-SEP-18	R4239307
Manganese (Mn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Nickel (Ni)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4239307
Selenium (Se)-Total	<0.000040		0.000040	mg/L		24-SEP-18	R4239307

* 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
L2162579-22 TB-L							
Sampled By: CLIENT on 08-SEP-18 @ 12:35							
Matrix: WATER							
Metals in Water by CRC ICPMS (No Digest)							
Silver (Ag)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Strontium (Sr)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Thallium (Tl)-Total	<0.0000050		0.0000050	mg/L		24-SEP-18	R4239307
Tin (Sn)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Titanium (Ti)-Total	<0.00010		0.00010	mg/L		24-SEP-18	R4239307
Uranium (U)-Total	<0.000010		0.000010	mg/L		24-SEP-18	R4239307
Vanadium (V)-Total	<0.000050		0.000050	mg/L		24-SEP-18	R4239307
Zinc (Zn)-Total	<0.00080		0.00080	mg/L		24-SEP-18	R4239307
Total Metals in Water by CRC ICPMS							
Silicon (Si)-Total	<0.10		0.10	mg/L		24-SEP-18	R4248447
Sulfur (S)-Total	<0.50		0.50	mg/L		24-SEP-18	R4248447
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L		24-SEP-18	R4248447
Nutrients in Water for Golder Calgary							
Ammonia in Water by Colour							
Ammonia, Total (as N)	<0.0050		0.0050	mg/L		26-SEP-18	R4247349
TKN in Water by Colour							
Total Kjeldahl Nitrogen	<0.050		0.050	mg/L	04-OCT-18	05-OCT-18	R4263035
Total Dissolved P in Water by Colour							
Phosphorus (P)-Total Dissolved	<0.0010		0.0010	mg/L		18-SEP-18	R4220108
Total P in Water by Colour							
Phosphorus (P)-Total	<0.0010		0.0010	mg/L		18-SEP-18	R4220108
Routine Water for Golder Calgary							
Chloride in Water by IC							
Chloride (Cl)	<0.50		0.50	mg/L		13-SEP-18	R4216859
Color, True							
Color, True	<2.0		2.0	C.U.		13-SEP-18	R4215355
Fluoride in Water by IC							
Fluoride (F)	<0.020		0.020	mg/L		13-SEP-18	R4216859
Hardness (from Dissolved Ca and Mg)							
Hardness (as CaCO3)	<0.053		0.053	mg/L		29-SEP-18	
Ion Balance Calculation							
TDS (Calculated)	<1.0			mg/L		29-SEP-18	
Nitrate in Water by IC (Low Level)							
Nitrate (as N)	<0.0050		0.0050	mg/L		13-SEP-18	R4216859
Nitrite in Water by IC (Low Level)							
Nitrite (as N)	<0.0010		0.0010	mg/L		13-SEP-18	R4216859
Sulfate in Water by IC (Low Level)							
Sulfate (SO4)	<0.050		0.050	mg/L		13-SEP-18	R4216859
Sulphide							
Sulphide (as S)	<0.0015		0.0015	mg/L		13-SEP-18	R4216147
Total Dissolved Solids							
Total Dissolved Solids	<10		10	mg/L		14-SEP-18	R4217443
Total Suspended Solids							
Total Suspended Solids	<3.0		3.0	mg/L		14-SEP-18	R4217349
Turbidity							
Turbidity	0.39		0.10	NTU		13-SEP-18	R4215575
pH, Conductivity and Total Alkalinity							
pH	4.93		0.10	pH		14-SEP-18	R4216074
Conductivity (EC)	<2.0		2.0	uS/cm		14-SEP-18	R4216074
Bicarbonate (HCO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Carbonate (CO3)	<5.0		5.0	mg/L		14-SEP-18	R4216074
Hydroxide (OH)	<5.0		5.0	mg/L		14-SEP-18	R4216074

* 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
L2162579-22 TB-L							
Sampled By: CLIENT on 08-SEP-18 @ 12:35							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		14-SEP-18	R4216074
Miscellaneous Parameters							
Orthophosphate-Dissolved (as P)	<0.0010		0.0010	mg/L		13-SEP-18	R4215428
Dissolved Organic Carbon	<0.50		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Free	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Ra-226	0.027		0.0053	Bq/L	04-OCT-18	10-OCT-18	R4252755
Silicate (as SiO2)	<0.010		0.010	mg/L		15-SEP-18	R4217050
Cyanide, Total	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Mercury (Hg)-Total	<0.0011	RRR	0.0011	ug/L		21-SEP-18	R4232461
Total Nitrogen	<0.050		0.050	mg/L		05-OCT-18	
Total Organic Carbon	<0.50		0.50	mg/L		01-OCT-18	R4258552
Cyanide, Weak Acid Diss	<0.0050		0.0050	mg/L		21-SEP-18	R4237608
Diss. Mercury in Water by CVAFS (Ultra)							
Dissolved Mercury Filtration Location	FIELD					26-SEP-18	R4243008
Mercury (Hg)-Dissolved	<0.00063	RRR	0.00063	ug/L	26-SEP-18	27-SEP-18	R4248829

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

Reference Information

Sample Parameter Qualifier Key:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
DLRC	Detection Limit Raised for RadioChemistry test due to sample matrix (e.g. high TDS) or instrument detector conditions.
DTC	Dissolved concentration exceeds total. Results were confirmed by re-analysis.
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRR	Refer to Report Remarks for issues regarding this analysis
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-DIS-ORG-LOW-CL	Water	Dissolved Organic Carbon	APHA 5310 B-Instrumental

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.
TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 TOTAL ORGANIC CARBON (TOC)

This method is applicable to the analysis of ground water, wastewater, and surface water samples. The form detected depends upon sample pretreatment: Unfiltered sample = TC, 0.45um filtered = TDC. Samples are injected into a combustion tube containing an oxidation catalyst. The carrier gas containing the combustion product from the combustion tube flows through an inorganic carbon reactor vessel and is then sent through a halogen scrubber into a sample cell set in a non-dispersive infrared gas analyzer (NDIR) where carbon dioxide is detected. For total inorganic carbon and dissolved inorganic carbon, the sample is injected into an IC reactor vessel where only the IC component is decomposed to become carbon dioxide.

The peak area generated by the NDIR indicates the TC/TDC or TIC/DIC as applicable. The total organic carbon content of the sample is calculated by subtracting the TIC from the TC.
TOC = TC-TIC, DOC = TDC-DIC, Particulate = Total - Dissolved.

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

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

CN-FREE-CFA-VA	Water	Free Cyanide in water by CFA	ASTM 7237

This analysis is carried out using procedures adapted from ASTM Method 7237 "Free Cyanide with Flow Injection Analysis (FIA) Utilizing Gas Diffusion Separation and Amperometric Detection". Free cyanide is determined by in-line gas diffusion at pH 6 with final determination by colourimetric analysis.

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

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

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

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

COL-TRU-ED	Water	Color, True	APHA 2120

True Colour is measured using a colorimeter by comparison to platinum-cobalt standards using the single wavelength method (450 - 465 nm) after filtration of sample through a 0.45 um filter. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Concurrent measurement of sample pH is recommended.

ETL-HARDNESS-DIS-ED	Water	Hardness (from Dissolved Ca and Mg)	APHA 2340 B-Calculation
F-IC-N-ED	Water	Fluoride in Water by IC	EPA 300.1 (mod)

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

HG-D-U-CVAF-VA	Water	Diss. Mercury in Water by CVAFS (Ultra)	APHA 3030 B / EPA 1631 REV. E

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

(EPA). The procedure may involve preliminary sample treatment by filtration (APHA 3030B) and involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry.

HG-T-U-CVAF-VA	Water	Total Mercury in Water by CVAFS (Ultra)	EPA 1631 REV. E

This analysis is carried out using procedures adapted from Method 1631 Rev. E. by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to a purge and trap concentration step and final reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry.

IONBALANCE-ED	Water	Ion Balance Calculation	APHA 1030E
MET-D-CCMS-ED	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)

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

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

MET-D-NP-U-CCMS-ED	Water	Diss. Metals in Water by CRC ICPMS (Ult)	APHA 3125-ICP-MS

Ultra trace metals in water are analyzed by ICPMS, based on US EPA Method 6020A (Jan 1998). This procedure is intended for pristine field-filtered acid-preserved water samples. ALS recommends that filtration blanks be submitted for this test to aid with interpretation of results.

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

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

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

MET-T-NP-U-CCMS-ED	Water	Metals in Water by CRC ICPMS (No Digest)	APHA 3125-ICP-MS

Ultra trace metals in water are analyzed by ICPMS, based on US EPA Method 6020A (Jan 1998). The detection limits provided can only be met for undigested samples. This procedure is intended for pristine, non-turbid, acid-preserved water samples, where sample turbidity is < 1 NTU. Where turbidity exceeds 1 NTU, results may be biased low compared to true Total Metals concentrations. ALS recommends that turbidity analysis be requested on samples submitted for this test to aid with interpretation of results.

N-T-CALC-ED	Water	Total Nitrogen (Calculation)	APHA 4500 N-Calculated

Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)]

NH3-L-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)

This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.

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

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

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

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

P-T-L-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

P-TD-L-COL-ED	Water	Total Dissolved P in Water by Colour	APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Dissolved Phosphorous is determined colourimetrically after persulphate digestion of a sample that has been lab or field filtered through a 0.45 micron membrane filter.

PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320

All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed).
pH measurement is determined from the activity of the hydrogen ions using a hydrogen electrode and a reference electrode.
Alkalinity measurement is based on the sample's capacity to neutralize acid. Auto-titration to pH 4.5 using 0.02N H_2SO_4 is performed.
Conductivity measurement is based on the sample's capacity to convey an electric current, and is measured with a conductivity meter.

PO4-DO-L-COL-ED	Water	Diss. Orthophosphate in Water 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.

RA226-MMER-FC	Water	Ra226 by Alpha Scint, MDC=0.01 Bq/L	EPA 903.1
SILICATE-COL-ED	Water	Reactive Silica by Colour	APHA 4500-SiO_2 E.

This analysis is carried out using procedures adapted from APHA Method 4500-SiO_2 E. "Silica". Silicate (molybdate-reactive silica) is determined by

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
		the molybdosilicate-heteropoly blue colourimetric method.	
SILICATE-L-COL-ED	Water	Reactive Silica by Colour	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.	
SO4-L-IC-N-ED	Water	Sulfate in Water by IC (Low Level)	EPA 300.1 (mod)
		Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.	
SOLIDS-TDS-ED	Water	Total Dissolved Solids	APHA 2540 C
		Gravimetric determination of solids in waters by filtration and evaporating filtrate to dryness at 180 degrees Celsius.	
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
		Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius.	
SULPHIDE-CFA-ED	Water	Sulphide	APHA 4500 -S E-Auto-Colorimetry
		A continuous flow manifold adds HCl to the sample which converts sulphide to a gas, then the sulphide is separated from the flow using a gas dialysis membrane. A colorimetric reaction produces a methylene blue compound which is measured at 660 nm. This follows the Standard Methods procedure 4500 S-E.	
TKN-L-CFA-ED	Water	TKN in Water by Colour	APHA 4500-NORG (TKN)
		This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 celcius with analysis using an automated colourimetric finish.	
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer
		This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.	

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

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

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA
CL	ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA
FC	ALS ENVIRONMENTAL - FORT COLLINS, COLORADO, USA

Chain of Custody Numbers:

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: GOLDER ASSOCIATES LTD
16820 107 Ave NW
EDMONTON AB T5P 4C3
Contact: Zenovia Craciunescu / Kerrie Serbin

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-DIS-ORG-LOW-CL	**Water**							
Batch R4258412								
WG2893998-7 DUP		**L2162579-7**						
Dissolved Organic Carbon		3.48	3.47		mg/L	0.1	20	01-OCT-18
WG2893998-2 LCS								
Dissolved Organic Carbon			91.9		%		80-120	01-OCT-18
WG2893998-6 LCS								
Dissolved Organic Carbon			104.6		%		80-120	01-OCT-18
WG2893998-1 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	01-OCT-18
WG2893998-5 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	01-OCT-18
WG2893998-8 MS		**L2162579-8**						
Dissolved Organic Carbon			93.2		%		70-130	01-OCT-18
Batch R4258552								
WG2894161-3 DUP		**L2162579-16**						
Dissolved Organic Carbon		3.75	3.56		mg/L	5.2	20	01-OCT-18
WG2894161-2 LCS								
Dissolved Organic Carbon			97.6		%		80-120	01-OCT-18
WG2894161-1 MB								
Dissolved Organic Carbon			<0.50		mg/L		0.5	01-OCT-18
WG2894161-4 MS		**L2162579-17**						
Dissolved Organic Carbon			90.5		%		70-130	01-OCT-18
C-TOT-ORG-LOW-CL	**Water**							
Batch R4258412								
WG2893998-7 DUP		**L2162579-7**						
Total Organic Carbon		3.61	3.41		mg/L	5.5	20	01-OCT-18
WG2893998-2 LCS								
Total Organic Carbon			92.2		%		80-120	01-OCT-18
WG2893998-6 LCS								
Total Organic Carbon			99.7		%		80-120	01-OCT-18
WG2893998-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	01-OCT-18
WG2893998-5 MB								
Total Organic Carbon			<0.50		mg/L		0.5	01-OCT-18
WG2893998-8 MS		**L2162579-8**						
Total Organic Carbon			97.8		%		70-130	01-OCT-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-TOT-ORG-LOW-CL	**Water**							
Batch R4258552								
WG2894161-3 DUP		**L2162579-16**						
Total Organic Carbon		3.50	3.48		mg/L	0.6	20	01-OCT-18
WG2894161-2 LCS								
Total Organic Carbon			98.1		%		80-120	01-OCT-18
WG2894161-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	01-OCT-18
WG2894161-4 MS		**L2162579-17**						
Total Organic Carbon			98.5		%		70-130	01-OCT-18
Batch R4259820								
WG2895564-2 LCS								
Total Organic Carbon			101.1		%		80-120	03-OCT-18
WG2895564-1 MB								
Total Organic Carbon			<0.50		mg/L		0.5	03-OCT-18
CL-IC-N-ED	**Water**							
Batch R4216859								
WG2875838-11 LCS								
Chloride (Cl)			101.3		%		90-110	13-SEP-18
WG2875838-13 LCS								
Chloride (Cl)			102.7		%		90-110	14-SEP-18
WG2875838-15 LCS								
Chloride (Cl)			101.5		%		90-110	14-SEP-18
WG2875838-2 LCS								
Chloride (Cl)			101.3		%		90-110	13-SEP-18
WG2875838-1 MB								
Chloride (Cl)			<0.50		mg/L		0.5	13-SEP-18
WG2875838-12 MB								
Chloride (Cl)			<0.50		mg/L		0.5	13-SEP-18
WG2875838-14 MB								
Chloride (Cl)			<0.50		mg/L		0.5	14-SEP-18
WG2875838-16 MB								
Chloride (Cl)			<0.50		mg/L		0.5	14-SEP-18
CN-FREE-CFA-VA	**Water**							
Batch R4233068								
WG2882603-10 DUP		**L2162579-5**						
Cyanide, Free		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	20-SEP-18
WG2882603-7 LCS								
Cyanide, Free			85.1		%		80-120	20-SEP-18
WG2882603-6 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-FREE-CFA-VA	**Water**							
Batch R4233068								
WG2882603-6 MB								
Cyanide, Free			<0.0050		mg/L		0.005	20-SEP-18
WG2882603-9 MS		**L2162579-5**						
Cyanide, Free			87.1		%		75-125	20-SEP-18
Batch R4237608								
WG2883794-15 DUP		**L2162579-11**						
Cyanide, Free		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	21-SEP-18
WG2883794-3 DUP		**L2162579-3**						
Cyanide, Free		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	21-SEP-18
WG2883794-2 LCS								
Cyanide, Free			84.9		%		80-120	21-SEP-18
WG2883794-1 MB								
Cyanide, Free			<0.0050		mg/L		0.005	21-SEP-18
WG2883794-14 MS		**L2162579-11**						
Cyanide, Free			85.1		%		75-125	21-SEP-18
WG2883794-4 MS		**L2162579-3**						
Cyanide, Free			83.0		%		75-125	21-SEP-18
Batch R4239379								
WG2885544-12 LCS								
Cyanide, Free			86.0		%		80-120	24-SEP-18
WG2885544-7 LCS								
Cyanide, Free			84.7		%		80-120	24-SEP-18
WG2885544-11 MB								
Cyanide, Free			<0.0050		mg/L		0.005	24-SEP-18
WG2885544-6 MB								
Cyanide, Free			<0.0050		mg/L		0.005	24-SEP-18
Batch R4241413								
WG2886756-12 LCS								
Cyanide, Free			86.3		%		80-120	25-SEP-18
WG2886756-11 MB								
Cyanide, Free			<0.0050		mg/L		0.005	25-SEP-18
CN-T-CFA-VA	**Water**							
Batch R4233068								
WG2882603-10 DUP		**L2162579-5**						
Cyanide, Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	20-SEP-18
WG2882603-7 LCS								
Cyanide, Total			85.2		%		80-120	20-SEP-18
WG2882603-6 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-T-CFA-VA	**Water**							
Batch R4233068								
WG2882603-6 MB								
Cyanide, Total			<0.0050		mg/L		0.005	20-SEP-18
WG2882603-9 MS		**L2162579-5**						
Cyanide, Total			86.5		%		75-125	20-SEP-18
Batch R4237608								
WG2883794-15 DUP		**L2162579-11**						
Cyanide, Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	21-SEP-18
WG2883794-3 DUP		**L2162579-3**						
Cyanide, Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	21-SEP-18
WG2883794-12 LCS								
Cyanide, Total			81.3		%		80-120	21-SEP-18
WG2883794-2 LCS								
Cyanide, Total			81.5		%		80-120	21-SEP-18
WG2883794-7 LCS								
Cyanide, Total			82.0		%		80-120	21-SEP-18
WG2883794-1 MB								
Cyanide, Total			<0.0050		mg/L		0.005	21-SEP-18
WG2883794-11 MB								
Cyanide, Total			<0.0050		mg/L		0.005	21-SEP-18
WG2883794-6 MB								
Cyanide, Total			<0.0050		mg/L		0.005	21-SEP-18
WG2883794-14 MS		**L2162579-11**						
Cyanide, Total			84.4		%		75-125	21-SEP-18
WG2883794-4 MS		**L2162579-3**						
Cyanide, Total			81.4		%		75-125	21-SEP-18
Batch R4239379								
WG2885544-12 LCS								
Cyanide, Total			84.7		%		80-120	24-SEP-18
WG2885544-7 LCS								
Cyanide, Total			84.4		%		80-120	24-SEP-18
WG2885544-11 MB								
Cyanide, Total			<0.0050		mg/L		0.005	24-SEP-18
WG2885544-6 MB								
Cyanide, Total			<0.0050		mg/L		0.005	24-SEP-18
Batch R4241413								
WG2886756-12 LCS								
Cyanide, Total			84.2		%		80-120	25-SEP-18
WG2886756-11 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-T-CFA-VA	**Water**							
Batch R4241413								
WG2886756-11 MB								
Cyanide, Total			<0.0050		mg/L		0.005	25-SEP-18
CN-WAD-CFA-VA	**Water**							
Batch R4233068								
WG2882603-10 DUP		**L2162579-5**						
Cyanide, Weak Acid Diss		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	20-SEP-18
WG2882603-7 LCS								
Cyanide, Weak Acid Diss			91.4		%		80-120	20-SEP-18
WG2882603-6 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	20-SEP-18
WG2882603-9 MS		**L2162579-5**						
Cyanide, Weak Acid Diss			88.2		%		75-125	20-SEP-18
Batch R4237608								
WG2883794-15 DUP		**L2162579-11**						
Cyanide, Weak Acid Diss		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	21-SEP-18
WG2883794-3 DUP		**L2162579-3**						
Cyanide, Weak Acid Diss		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	21-SEP-18
WG2883794-12 LCS								
Cyanide, Weak Acid Diss			85.4		%		80-120	21-SEP-18
WG2883794-2 LCS								
Cyanide, Weak Acid Diss			85.2		%		80-120	21-SEP-18
WG2883794-7 LCS								
Cyanide, Weak Acid Diss			88.9		%		80-120	21-SEP-18
WG2883794-1 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	21-SEP-18
WG2883794-11 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	21-SEP-18
WG2883794-6 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	21-SEP-18
WG2883794-14 MS		**L2162579-11**						
Cyanide, Weak Acid Diss			84.5		%		75-125	21-SEP-18
WG2883794-4 MS		**L2162579-3**						
Cyanide, Weak Acid Diss			83.2		%		75-125	21-SEP-18
Batch R4239379								
WG2885544-12 LCS								
Cyanide, Weak Acid Diss			84.1		%		80-120	24-SEP-18
WG2885544-7 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-WAD-CFA-VA	**Water**							
Batch R4239379								
WG2885544-7 LCS								
Cyanide, Weak Acid Diss			83.7		%		80-120	24-SEP-18
WG2885544-11 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	24-SEP-18
WG2885544-6 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	24-SEP-18
Batch R4241413								
WG2886756-12 LCS								
Cyanide, Weak Acid Diss			83.2		%		80-120	25-SEP-18
WG2886756-11 MB								
Cyanide, Weak Acid Diss			<0.0050		mg/L		0.005	25-SEP-18
COL-TRU-ED	**Water**							
Batch R4215355								
WG2875790-3 DUP		**L2162579-10**						
Color, True		<2.0	<2.0	RPD-NA	C.U.	N/A	20	13-SEP-18
WG2875790-2 LCS								
Color, True			101.6		%		85-115	13-SEP-18
WG2875790-5 LCS								
Color, True			97.0		%		85-115	13-SEP-18
WG2875790-1 MB								
Color, True			<2.0		C.U.		2	13-SEP-18
WG2875790-4 MB								
Color, True			<2.0		C.U.		2	13-SEP-18
F-IC-N-ED	**Water**							
Batch R4216859								
WG2875838-11 LCS								
Fluoride (F)			101.6		%		90-110	13-SEP-18
WG2875838-13 LCS								
Fluoride (F)			98.3		%		90-110	14-SEP-18
WG2875838-15 LCS								
Fluoride (F)			99.99		%		90-110	14-SEP-18
WG2875838-2 LCS								
Fluoride (F)			102.9		%		90-110	13-SEP-18
WG2875838-1 MB								
Fluoride (F)			<0.020		mg/L		0.02	13-SEP-18
WG2875838-12 MB								
Fluoride (F)			<0.020		mg/L		0.02	13-SEP-18
WG2875838-14 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-ED	**Water**							
Batch R4216859								
WG2875838-14 MB								
Fluoride (F)			<0.020		mg/L		0.02	14-SEP-18
WG2875838-16 MB								
Fluoride (F)			<0.020		mg/L		0.02	14-SEP-18
HG-D-U-CVAF-VA	**Water**							
Batch R4248829								
WG2887437-3 DUP		**L2162579-2**						
Mercury (Hg)-Dissolved		<0.00050	<0.00050	RPD-NA	ug/L	N/A	20	27-SEP-18
WG2887443-3 DUP		**L2162579-22**						
Mercury (Hg)-Dissolved		<0.00063	<0.00060	RPD-NA	ug/L	N/A	20	27-SEP-18
WG2887437-2 LCS								
Mercury (Hg)-Dissolved			101.4		%		80-120	27-SEP-18
WG2887443-2 LCS								
Mercury (Hg)-Dissolved			101.4		%		80-120	27-SEP-18
WG2888695-2 LCS								
Mercury (Hg)-Dissolved			101.4		%		80-120	27-SEP-18
WG2887437-1 MB		**NP**						
Mercury (Hg)-Dissolved			<0.00050		ug/L		0.0005	27-SEP-18
WG2887443-1 MB		**NP**						
Mercury (Hg)-Dissolved			<0.00050		ug/L		0.0005	27-SEP-18
WG2888695-1 MB								
Mercury (Hg)-Dissolved			<0.00050		ug/L		0.0005	27-SEP-18
WG2887437-4 MS		**L2162579-1**						
Mercury (Hg)-Dissolved			89.6		%		70-130	27-SEP-18
WG2887443-4 MS		**L2162579-21**						
Mercury (Hg)-Dissolved			88.2		%		70-130	27-SEP-18
HG-T-U-CVAF-VA	**Water**							
Batch R4232461								
WG2883167-3 DUP		**L2162579-20**						
Mercury (Hg)-Total		<0.0014	<0.0013	RPD-NA	ug/L	N/A	20	21-SEP-18
WG2883167-2 LCS								
Mercury (Hg)-Total			94.3		%		80-120	21-SEP-18
WG2883167-1 MB								
Mercury (Hg)-Total			<0.00050		ug/L		0.0005	21-SEP-18
Batch R4244193								
WG2887832-3 DUP		**L2162579-16**						
Mercury (Hg)-Total		<0.00050	<0.00050	RPD-NA	ug/L	N/A	20	26-SEP-18
WG2887832-2 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-T-U-CVAF-VA	**Water**							
Batch R4244193								
WG2887832-2 LCS								
Mercury (Hg)-Total			100.0		%		80-120	26-SEP-18
WG2887832-1 MB								
Mercury (Hg)-Total			<0.00050		ug/L		0.0005	26-SEP-18
WG2887832-4 MS		**L2162579-3**						
Mercury (Hg)-Total			104.8		%		70-130	26-SEP-18
MET-D-NP-U-CCMS-ED	**Water**							
Batch R4244190								
WG2884857-11 DUP		**L2162579-9**						
Aluminum (Al)-Dissolved		0.00144	0.00147		mg/L	1.8	20	25-SEP-18
Antimony (Sb)-Dissolved		<0.000020	<0.000020	RPD-NA	mg/L	N/A	20	25-SEP-18
Arsenic (As)-Dissolved		0.000146	0.000160		mg/L	9.0	20	25-SEP-18
Barium (Ba)-Dissolved		0.00265	0.00273		mg/L	3.1	20	25-SEP-18
Beryllium (Be)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	25-SEP-18
Bismuth (Bi)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	25-SEP-18
Boron (B)-Dissolved		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	25-SEP-18
Cadmium (Cd)-Dissolved		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	25-SEP-18
Calcium (Ca)-Dissolved		1.89	1.88		mg/L	0.4	20	25-SEP-18
Chromium (Cr)-Dissolved		<0.000060	<0.000060	RPD-NA	mg/L	N/A	20	25-SEP-18
Cobalt (Co)-Dissolved		0.000023	0.000023		mg/L	1.6	20	25-SEP-18
Copper (Cu)-Dissolved		0.00036	0.00036		mg/L	1.2	20	25-SEP-18
Iron (Fe)-Dissolved		0.0129	0.0130		mg/L	0.7	20	25-SEP-18
Lead (Pb)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	25-SEP-18
Lithium (Li)-Dissolved		0.00069	0.00068		mg/L	0.4	20	25-SEP-18
Magnesium (Mg)-Dissolved		1.78	1.76		mg/L	0.9	20	25-SEP-18
Manganese (Mn)-Dissolved		0.000504	0.000495		mg/L	1.7	20	25-SEP-18
Molybdenum (Mo)-Dissolved		0.000478	0.000469		mg/L	1.9	20	25-SEP-18
Nickel (Ni)-Dissolved		0.000657	0.000687		mg/L	4.5	20	25-SEP-18
Potassium (K)-Dissolved		0.365	0.365		mg/L	0.1	20	25-SEP-18
Selenium (Se)-Dissolved		<0.000040	<0.000040	RPD-NA	mg/L	N/A	20	25-SEP-18
Silver (Ag)-Dissolved		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	25-SEP-18
Sodium (Na)-Dissolved		0.651	0.653		mg/L	0.2	20	25-SEP-18
Strontium (Sr)-Dissolved		0.00634	0.00643		mg/L	1.4	20	25-SEP-18
Thallium (Tl)-Dissolved		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	25-SEP-18
Tin (Sn)-Dissolved		0.000080	0.000087		mg/L	8.3	20	25-SEP-18
Titanium (Ti)-Dissolved		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	25-SEP-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch R4244190								
WG2884857-11 DUP		**L2162579-9**						
Uranium (U)-Dissolved		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	25-SEP-18
Vanadium (V)-Dissolved		<0.000050	0.000051	RPD-NA	mg/L	N/A	20	25-SEP-18
Zinc (Zn)-Dissolved		<0.00080	<0.00080	RPD-NA	mg/L	N/A	20	25-SEP-18
WG2884857-5 MB								
Aluminum (Al)-Dissolved			<0.00030		mg/L		0.0003	25-SEP-18
Antimony (Sb)-Dissolved			<0.000020		mg/L		0.00002	25-SEP-18
Arsenic (As)-Dissolved			<0.000020		mg/L		0.00002	25-SEP-18
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	25-SEP-18
Beryllium (Be)-Dissolved			<0.000010		mg/L		0.00001	25-SEP-18
Bismuth (Bi)-Dissolved			<0.000010		mg/L		0.00001	25-SEP-18
Boron (B)-Dissolved			<0.0010		mg/L		0.001	25-SEP-18
Cadmium (Cd)-Dissolved			<0.0000050		mg/L		0.000005	25-SEP-18
Calcium (Ca)-Dissolved			<0.020		mg/L		0.02	25-SEP-18
Chromium (Cr)-Dissolved			<0.000060		mg/L		0.00006	25-SEP-18
Cobalt (Co)-Dissolved			<0.000010		mg/L		0.00001	25-SEP-18
Copper (Cu)-Dissolved			<0.00010		mg/L		0.0001	25-SEP-18
Iron (Fe)-Dissolved			<0.0010		mg/L		0.001	25-SEP-18
Lead (Pb)-Dissolved			<0.000010		mg/L		0.00001	25-SEP-18
Lithium (Li)-Dissolved			<0.00050		mg/L		0.0005	25-SEP-18
Magnesium (Mg)-Dissolved			<0.0040		mg/L		0.004	25-SEP-18
Manganese (Mn)-Dissolved			<0.000050		mg/L		0.00005	25-SEP-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	25-SEP-18
Nickel (Ni)-Dissolved			<0.000060		mg/L		0.00006	25-SEP-18
Potassium (K)-Dissolved			<0.020		mg/L		0.02	25-SEP-18
Selenium (Se)-Dissolved			<0.000040		mg/L		0.00004	25-SEP-18
Silver (Ag)-Dissolved			<0.0000050		mg/L		0.000005	25-SEP-18
Sodium (Na)-Dissolved			<0.0050		mg/L		0.005	25-SEP-18
Strontium (Sr)-Dissolved			<0.000050		mg/L		0.00005	25-SEP-18
Thallium (Tl)-Dissolved			<0.0000050		mg/L		0.000005	25-SEP-18
Tin (Sn)-Dissolved			<0.000050		mg/L		0.00005	25-SEP-18
Titanium (Ti)-Dissolved			<0.00010		mg/L		0.0001	25-SEP-18
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	25-SEP-18
Vanadium (V)-Dissolved			<0.000050		mg/L		0.00005	25-SEP-18
Zinc (Zn)-Dissolved			<0.00080		mg/L		0.0008	25-SEP-18
WG2884857-9 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch	**R4244190**							
WG2884857-9	**MB**							
Aluminum (Al)-Dissolved			<0.00030		mg/L		0.0003	25-SEP-18
Antimony (Sb)-Dissolved			<0.000020		mg/L		0.00002	25-SEP-18
Arsenic (As)-Dissolved			<0.000020		mg/L		0.00002	25-SEP-18
Barium (Ba)-Dissolved			<0.000050		mg/L		0.00005	25-SEP-18
Beryllium (Be)-Dissolved			<0.000010		mg/L		0.00001	25-SEP-18
Bismuth (Bi)-Dissolved			<0.000010		mg/L		0.00001	25-SEP-18
Boron (B)-Dissolved			<0.0010		mg/L		0.001	25-SEP-18
Cadmium (Cd)-Dissolved			<0.000005C		mg/L		0.000005	25-SEP-18
Calcium (Ca)-Dissolved			<0.020		mg/L		0.02	25-SEP-18
Chromium (Cr)-Dissolved			<0.000060		mg/L		0.00006	25-SEP-18
Cobalt (Co)-Dissolved			<0.000010		mg/L		0.00001	25-SEP-18
Copper (Cu)-Dissolved			<0.00010		mg/L		0.0001	25-SEP-18
Iron (Fe)-Dissolved			<0.0010		mg/L		0.001	25-SEP-18
Lead (Pb)-Dissolved			<0.000010		mg/L		0.00001	25-SEP-18
Lithium (Li)-Dissolved			<0.00050		mg/L		0.0005	25-SEP-18
Magnesium (Mg)-Dissolved			<0.0040		mg/L		0.004	25-SEP-18
Manganese (Mn)-Dissolved			<0.000050		mg/L		0.00005	25-SEP-18
Molybdenum (Mo)-Dissolved			<0.000050		mg/L		0.00005	25-SEP-18
Nickel (Ni)-Dissolved			<0.000060		mg/L		0.00006	25-SEP-18
Potassium (K)-Dissolved			<0.020		mg/L		0.02	25-SEP-18
Selenium (Se)-Dissolved			<0.000040		mg/L		0.00004	25-SEP-18
Silver (Ag)-Dissolved			<0.000005C		mg/L		0.000005	25-SEP-18
Sodium (Na)-Dissolved			<0.0050		mg/L		0.005	25-SEP-18
Strontium (Sr)-Dissolved			<0.000050		mg/L		0.00005	25-SEP-18
Thallium (Tl)-Dissolved			<0.000005C		mg/L		0.000005	25-SEP-18
Tin (Sn)-Dissolved			<0.000050		mg/L		0.00005	25-SEP-18
Titanium (Ti)-Dissolved			<0.00010		mg/L		0.0001	25-SEP-18
Uranium (U)-Dissolved			<0.000010		mg/L		0.00001	25-SEP-18
Vanadium (V)-Dissolved			<0.000050		mg/L		0.00005	25-SEP-18
Zinc (Zn)-Dissolved			<0.00080		mg/L		0.0008	25-SEP-18
WG2884857-12	**MS**	**L2162579-10**						
Aluminum (Al)-Dissolved			100.0		%		70-130	25-SEP-18
Antimony (Sb)-Dissolved			99.5		%		70-130	25-SEP-18
Arsenic (As)-Dissolved			99.1		%		70-130	25-SEP-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch	**R4244190**							
WG2884857-12 MS		**L2162579-10**						
Barium (Ba)-Dissolved			98.9		%		70-130	25-SEP-18
Beryllium (Be)-Dissolved			97.5		%		70-130	25-SEP-18
Boron (B)-Dissolved			98.4		%		70-130	25-SEP-18
Cadmium (Cd)-Dissolved			102.5		%		70-130	25-SEP-18
Calcium (Ca)-Dissolved			101.8		%		70-130	25-SEP-18
Chromium (Cr)-Dissolved			95.9		%		70-130	25-SEP-18
Cobalt (Co)-Dissolved			100.1		%		70-130	25-SEP-18
Copper (Cu)-Dissolved			99.3		%		70-130	25-SEP-18
Iron (Fe)-Dissolved			97.5		%		70-130	25-SEP-18
Lead (Pb)-Dissolved			94.6		%		70-130	25-SEP-18
Lithium (Li)-Dissolved			96.4		%		70-130	25-SEP-18
Magnesium (Mg)-Dissolved			N/A	MS-B	%		-	25-SEP-18
Manganese (Mn)-Dissolved			98.2		%		70-130	25-SEP-18
Molybdenum (Mo)-Dissolved			92.1		%		70-130	25-SEP-18
Nickel (Ni)-Dissolved			101.1		%		70-130	25-SEP-18
Potassium (K)-Dissolved			98.7		%		70-130	25-SEP-18
Selenium (Se)-Dissolved			106.7		%		70-130	25-SEP-18
Silver (Ag)-Dissolved			105.8		%		70-130	25-SEP-18
Sodium (Na)-Dissolved			93.0		%		70-130	25-SEP-18
Strontium (Sr)-Dissolved			101.4		%		70-130	25-SEP-18
Thallium (Tl)-Dissolved			96.5		%		70-130	25-SEP-18
Tin (Sn)-Dissolved			99.0		%		70-130	25-SEP-18
Titanium (Ti)-Dissolved			98.5		%		70-130	25-SEP-18
Uranium (U)-Dissolved			91.8		%		70-130	25-SEP-18
Vanadium (V)-Dissolved			97.2		%		70-130	25-SEP-18
Zinc (Zn)-Dissolved			99.5		%		70-130	25-SEP-18
Batch	**R4251701**							
WG2884857-10 LCS								
Aluminum (Al)-Dissolved			103.4		%		80-120	28-SEP-18
Antimony (Sb)-Dissolved			95.7		%		80-120	28-SEP-18
Arsenic (As)-Dissolved			97.0		%		80-120	28-SEP-18
Barium (Ba)-Dissolved			98.9		%		80-120	28-SEP-18
Beryllium (Be)-Dissolved			96.8		%		80-120	28-SEP-18
Bismuth (Bi)-Dissolved			102.2		%		80-120	28-SEP-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch	**R4251701**							
WG2884857-10 LCS								
Boron (B)-Dissolved			98.6		%		80-120	28-SEP-18
Cadmium (Cd)-Dissolved			97.5		%		80-120	28-SEP-18
Calcium (Ca)-Dissolved			99.7		%		80-120	28-SEP-18
Chromium (Cr)-Dissolved			98.1		%		80-120	28-SEP-18
Cobalt (Co)-Dissolved			97.0		%		80-120	28-SEP-18
Copper (Cu)-Dissolved			95.3		%		80-120	28-SEP-18
Iron (Fe)-Dissolved			97.6		%		80-120	28-SEP-18
Lead (Pb)-Dissolved			99.0		%		80-120	28-SEP-18
Lithium (Li)-Dissolved			93.1		%		80-120	28-SEP-18
Magnesium (Mg)-Dissolved			95.1		%		80-120	28-SEP-18
Manganese (Mn)-Dissolved			95.7		%		80-120	28-SEP-18
Molybdenum (Mo)-Dissolved			94.3		%		80-120	28-SEP-18
Nickel (Ni)-Dissolved			95.2		%		80-120	28-SEP-18
Potassium (K)-Dissolved			99.2		%		80-120	28-SEP-18
Selenium (Se)-Dissolved			96.3		%		80-120	28-SEP-18
Silver (Ag)-Dissolved			99.3		%		80-120	28-SEP-18
Sodium (Na)-Dissolved			103.4		%		80-120	28-SEP-18
Strontium (Sr)-Dissolved			95.5		%		80-120	28-SEP-18
Thallium (Tl)-Dissolved			98.3		%		80-120	28-SEP-18
Tin (Sn)-Dissolved			97.3		%		80-120	28-SEP-18
Titanium (Ti)-Dissolved			94.8		%		80-120	28-SEP-18
Uranium (U)-Dissolved			98.6		%		80-120	28-SEP-18
Vanadium (V)-Dissolved			96.6		%		80-120	28-SEP-18
Zinc (Zn)-Dissolved			94.7		%		80-120	28-SEP-18
WG2884857-6 LCS								
Aluminum (Al)-Dissolved			99.8		%		80-120	28-SEP-18
Antimony (Sb)-Dissolved			93.1		%		80-120	28-SEP-18
Arsenic (As)-Dissolved			97.4		%		80-120	28-SEP-18
Barium (Ba)-Dissolved			100.5		%		80-120	28-SEP-18
Beryllium (Be)-Dissolved			97.0		%		80-120	28-SEP-18
Bismuth (Bi)-Dissolved			98.8		%		80-120	28-SEP-18
Boron (B)-Dissolved			97.3		%		80-120	28-SEP-18
Cadmium (Cd)-Dissolved			97.6		%		80-120	28-SEP-18
Calcium (Ca)-Dissolved			98.8		%		80-120	28-SEP-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-NP-U-CCMS-ED	**Water**							
Batch R4251701								
WG2884857-6 LCS								
Chromium (Cr)-Dissolved			96.2		%		80-120	28-SEP-18
Cobalt (Co)-Dissolved			97.2		%		80-120	28-SEP-18
Copper (Cu)-Dissolved			96.4		%		80-120	28-SEP-18
Iron (Fe)-Dissolved			94.8		%		80-120	28-SEP-18
Lead (Pb)-Dissolved			98.1		%		80-120	28-SEP-18
Lithium (Li)-Dissolved			90.4		%		80-120	28-SEP-18
Magnesium (Mg)-Dissolved			105.9		%		80-120	28-SEP-18
Manganese (Mn)-Dissolved			96.9		%		80-120	28-SEP-18
Molybdenum (Mo)-Dissolved			95.3		%		80-120	28-SEP-18
Nickel (Ni)-Dissolved			95.4		%		80-120	28-SEP-18
Potassium (K)-Dissolved			101.5		%		80-120	28-SEP-18
Selenium (Se)-Dissolved			94.3		%		80-120	28-SEP-18
Silver (Ag)-Dissolved			98.2		%		80-120	28-SEP-18
Sodium (Na)-Dissolved			104.2		%		80-120	28-SEP-18
Strontium (Sr)-Dissolved			96.9		%		80-120	28-SEP-18
Thallium (Tl)-Dissolved			96.9		%		80-120	28-SEP-18
Tin (Sn)-Dissolved			95.8		%		80-120	28-SEP-18
Titanium (Ti)-Dissolved			96.1		%		80-120	28-SEP-18
Uranium (U)-Dissolved			98.0		%		80-120	28-SEP-18
Vanadium (V)-Dissolved			96.3		%		80-120	28-SEP-18
Zinc (Zn)-Dissolved			95.0		%		80-120	28-SEP-18
MET-T-CCMS-ED	**Water**							
Batch R4248447								
WG2884841-19 DUP		**L2162579-19**						
Silicon (Si)-Total		1.21	1.21		mg/L	0.1	20	24-SEP-18
Sulfur (S)-Total		5.50	5.57		mg/L	1.3	20	24-SEP-18
Zirconium (Zr)-Total		0.000067	0.000064		mg/L	4.6	20	24-SEP-18
WG2884841-18 LCS								
Silicon (Si)-Total			102.0		%		70-130	24-SEP-18
Sulfur (S)-Total			92.9		%		70-130	24-SEP-18
Zirconium (Zr)-Total			93.9		%		70-130	24-SEP-18
WG2884841-13 MB								
Silicon (Si)-Total			<0.10		mg/L		0.1	25-SEP-18
Sulfur (S)-Total			<0.50		mg/L		0.5	25-SEP-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	25-SEP-18

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Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-ED	**Water**							
Batch R4248447								
WG2884841-17 MB								
Silicon (Si)-Total			<0.10		mg/L		0.1	25-SEP-18
Sulfur (S)-Total			<0.50		mg/L		0.5	25-SEP-18
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	25-SEP-18
WG2884841-20 MS		**L2162579-20**						
Silicon (Si)-Total			109.4		%		70-130	24-SEP-18
Sulfur (S)-Total			103.0		%		70-130	24-SEP-18
Zirconium (Zr)-Total			100.8		%		70-130	24-SEP-18
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4239307								
WG2884841-19 DUP		**L2162579-19**						
Aluminum (Al)-Total		0.0151	0.0144		mg/L	4.6	20	24-SEP-18
Antimony (Sb)-Total		<0.000020	<0.000020	RPD-NA	mg/L	N/A	20	24-SEP-18
Arsenic (As)-Total		0.000196	0.000186		mg/L	5.3	20	24-SEP-18
Barium (Ba)-Total		0.0110	0.0110		mg/L	0.3	20	24-SEP-18
Beryllium (Be)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	24-SEP-18
Bismuth (Bi)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	24-SEP-18
Boron (B)-Total		0.0014	0.0013		mg/L	14	20	24-SEP-18
Cadmium (Cd)-Total		0.0000152	0.0000177		mg/L	15	20	24-SEP-18
Chromium (Cr)-Total		0.000076	<0.000060	RPD-NA	mg/L	N/A	20	24-SEP-18
Cobalt (Co)-Total		0.000307	0.000288		mg/L	6.4	20	24-SEP-18
Copper (Cu)-Total		0.00163	0.00163		mg/L	0.2	20	24-SEP-18
Iron (Fe)-Total		0.0038	0.0035		mg/L	6.8	25	24-SEP-18
Lead (Pb)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	24-SEP-18
Lithium (Li)-Total		0.00093	0.00079		mg/L	17	20	24-SEP-18
Manganese (Mn)-Total		0.000742	0.000685		mg/L	8.0	20	24-SEP-18
Molybdenum (Mo)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	24-SEP-18
Nickel (Ni)-Total		0.00583	0.00578		mg/L	0.8	20	24-SEP-18
Selenium (Se)-Total		<0.000040	<0.000040	RPD-NA	mg/L	N/A	20	24-SEP-18
Silver (Ag)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	24-SEP-18
Strontium (Sr)-Total		0.0319	0.0286		mg/L	11	20	24-SEP-18
Thallium (Tl)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	24-SEP-18
Tin (Sn)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	24-SEP-18
Titanium (Ti)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	24-SEP-18
Uranium (U)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	24-SEP-18

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Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4239307								
WG2884841-19 DUP		**L2162579-19**						
Vanadium (V)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	24-SEP-18
Zinc (Zn)-Total		0.00208	0.00199		mg/L	4.0	20	24-SEP-18
WG2884841-18 LCS								
Aluminum (Al)-Total			98.1		%		80-120	24-SEP-18
Antimony (Sb)-Total			95.3		%		80-120	24-SEP-18
Arsenic (As)-Total			96.7		%		80-120	24-SEP-18
Barium (Ba)-Total			98.1		%		80-120	24-SEP-18
Beryllium (Be)-Total			91.6		%		80-120	24-SEP-18
Bismuth (Bi)-Total			89.9		%		80-120	24-SEP-18
Boron (B)-Total			92.8		%		80-120	24-SEP-18
Cadmium (Cd)-Total			95.5		%		80-120	24-SEP-18
Chromium (Cr)-Total			98.0		%		80-120	24-SEP-18
Cobalt (Co)-Total			96.9		%		80-120	24-SEP-18
Copper (Cu)-Total			95.1		%		80-120	24-SEP-18
Iron (Fe)-Total			92.5		%		80-120	24-SEP-18
Lead (Pb)-Total			92.6		%		80-120	24-SEP-18
Lithium (Li)-Total			91.6		%		80-120	24-SEP-18
Manganese (Mn)-Total			99.8		%		80-120	24-SEP-18
Molybdenum (Mo)-Total			94.1		%		80-120	24-SEP-18
Nickel (Ni)-Total			95.4		%		80-120	24-SEP-18
Selenium (Se)-Total			96.8		%		80-120	24-SEP-18
Silver (Ag)-Total			97.0		%		80-120	24-SEP-18
Strontium (Sr)-Total			95.8		%		80-120	24-SEP-18
Thallium (Tl)-Total			94.3		%		80-120	24-SEP-18
Tin (Sn)-Total			94.5		%		80-120	24-SEP-18
Titanium (Ti)-Total			95.8		%		80-120	24-SEP-18
Uranium (U)-Total			91.5		%		80-120	24-SEP-18
Vanadium (V)-Total			97.7		%		80-120	24-SEP-18
Zinc (Zn)-Total			92.4		%		80-120	24-SEP-18
WG2884841-13 MB								
Antimony (Sb)-Total			<0.000020		mg/L		0.00002	24-SEP-18
Arsenic (As)-Total			<0.000020		mg/L		0.00002	24-SEP-18
Barium (Ba)-Total			<0.000050		mg/L		0.00005	24-SEP-18
Beryllium (Be)-Total			<0.000010		mg/L		0.00001	24-SEP-18
Bismuth (Bi)-Total			<0.000010		mg/L		0.00001	24-SEP-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4239307								
WG2884841-13 MB								
Boron (B)-Total			<0.0010		mg/L		0.001	24-SEP-18
Cadmium (Cd)-Total			<0.000005(		mg/L		0.000005	24-SEP-18
Chromium (Cr)-Total			<0.000060		mg/L		0.00006	24-SEP-18
Cobalt (Co)-Total			<0.000010		mg/L		0.00001	24-SEP-18
Copper (Cu)-Total			<0.00010		mg/L		0.0001	24-SEP-18
Lead (Pb)-Total			<0.000010		mg/L		0.00001	24-SEP-18
Lithium (Li)-Total			<0.00050		mg/L		0.0005	24-SEP-18
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	24-SEP-18
Selenium (Se)-Total			<0.000040		mg/L		0.00004	24-SEP-18
Silver (Ag)-Total			<0.000005(		mg/L		0.000005	24-SEP-18
Strontium (Sr)-Total			<0.000050		mg/L		0.00005	24-SEP-18
Thallium (Tl)-Total			<0.000005(		mg/L		0.000005	24-SEP-18
Tin (Sn)-Total			<0.000050		mg/L		0.00005	24-SEP-18
Titanium (Ti)-Total			<0.00010		mg/L		0.0001	24-SEP-18
Uranium (U)-Total			<0.000010		mg/L		0.00001	24-SEP-18
Vanadium (V)-Total			<0.000050		mg/L		0.00005	24-SEP-18
Zinc (Zn)-Total			<0.00080		mg/L		0.0008	24-SEP-18
WG2884841-17 MB								
Antimony (Sb)-Total			<0.000020		mg/L		0.00002	24-SEP-18
Arsenic (As)-Total			<0.000020		mg/L		0.00002	24-SEP-18
Barium (Ba)-Total			<0.000050		mg/L		0.00005	24-SEP-18
Beryllium (Be)-Total			<0.000010		mg/L		0.00001	24-SEP-18
Bismuth (Bi)-Total			<0.000010		mg/L		0.00001	24-SEP-18
Boron (B)-Total			<0.0010		mg/L		0.001	24-SEP-18
Cadmium (Cd)-Total			<0.000005(		mg/L		0.000005	24-SEP-18
Cobalt (Co)-Total			<0.000010		mg/L		0.00001	24-SEP-18
Copper (Cu)-Total			<0.00010		mg/L		0.0001	24-SEP-18
Lead (Pb)-Total			<0.000010		mg/L		0.00001	24-SEP-18
Lithium (Li)-Total			<0.00050		mg/L		0.0005	24-SEP-18
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	24-SEP-18
Selenium (Se)-Total			<0.000040		mg/L		0.00004	24-SEP-18
Silver (Ag)-Total			<0.000005(		mg/L		0.000005	24-SEP-18
Strontium (Sr)-Total			<0.000050		mg/L		0.00005	24-SEP-18
Thallium (Tl)-Total			<0.000005(		mg/L		0.000005	24-SEP-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4239307								
WG2884841-17 MB								
Tin (Sn)-Total			<0.000050		mg/L		0.00005	24-SEP-18
Titanium (Ti)-Total			<0.00010		mg/L		0.0001	24-SEP-18
Uranium (U)-Total			<0.000010		mg/L		0.00001	24-SEP-18
Vanadium (V)-Total			<0.000050		mg/L		0.00005	24-SEP-18
Zinc (Zn)-Total			<0.00080		mg/L		0.0008	24-SEP-18
WG2884841-20 MS		**L2162579-20**						
Aluminum (Al)-Total			126.4		%		70-130	24-SEP-18
Antimony (Sb)-Total			103.2		%		70-130	24-SEP-18
Arsenic (As)-Total			98.8		%		70-130	24-SEP-18
Barium (Ba)-Total			100.6		%		70-130	24-SEP-18
Beryllium (Be)-Total			96.6		%		70-130	24-SEP-18
Boron (B)-Total			100.3		%		70-130	24-SEP-18
Cadmium (Cd)-Total			102.2		%		70-130	24-SEP-18
Chromium (Cr)-Total			98.3		%		70-130	24-SEP-18
Cobalt (Co)-Total			98.1		%		70-130	24-SEP-18
Copper (Cu)-Total			95.9		%		70-130	24-SEP-18
Iron (Fe)-Total			99.2		%		70-130	24-SEP-18
Lead (Pb)-Total			97.4		%		70-130	24-SEP-18
Lithium (Li)-Total			91.7		%		70-130	24-SEP-18
Manganese (Mn)-Total			101.3		%		70-130	24-SEP-18
Molybdenum (Mo)-Total			92.0		%		70-130	24-SEP-18
Nickel (Ni)-Total			96.0		%		70-130	24-SEP-18
Selenium (Se)-Total			111.8		%		70-130	24-SEP-18
Silver (Ag)-Total			105.7		%		70-130	24-SEP-18
Strontium (Sr)-Total			N/A	MS-B	%		-	24-SEP-18
Thallium (Tl)-Total			99.3		%		70-130	24-SEP-18
Tin (Sn)-Total			97.8		%		70-130	24-SEP-18
Titanium (Ti)-Total			103.5		%		70-130	24-SEP-18
Uranium (U)-Total			93.6		%		70-130	24-SEP-18
Vanadium (V)-Total			97.0		%		70-130	24-SEP-18
Zinc (Zn)-Total			95.0		%		70-130	24-SEP-18
Batch R4243667								
WG2884841-13 MB								
Aluminum (Al)-Total			<0.00030		mg/L		0.0003	25-SEP-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4243667								
WG2884841-13 MB								
Iron (Fe)-Total			<0.0010		mg/L		0.001	25-SEP-18
Manganese (Mn)-Total			<0.000050		mg/L		0.00005	25-SEP-18
Nickel (Ni)-Total			<0.000060		mg/L		0.00006	25-SEP-18
WG2884841-17 MB								
Aluminum (Al)-Total			<0.00030		mg/L		0.0003	25-SEP-18
Chromium (Cr)-Total			<0.000060		mg/L		0.00006	25-SEP-18
Iron (Fe)-Total			<0.0010		mg/L		0.001	25-SEP-18
Manganese (Mn)-Total			<0.000050		mg/L		0.00005	25-SEP-18
Nickel (Ni)-Total			<0.000060		mg/L		0.00006	25-SEP-18
Batch R4250171								
WG2884841-14 LCS								
Aluminum (Al)-Total			100.2		%		80-120	26-SEP-18
Antimony (Sb)-Total			96.1		%		80-120	26-SEP-18
Arsenic (As)-Total			98.6		%		80-120	26-SEP-18
Barium (Ba)-Total			104.7		%		80-120	26-SEP-18
Beryllium (Be)-Total			99.7		%		80-120	26-SEP-18
Bismuth (Bi)-Total			92.1		%		80-120	26-SEP-18
Boron (B)-Total			94.6		%		80-120	26-SEP-18
Cadmium (Cd)-Total			98.1		%		80-120	26-SEP-18
Chromium (Cr)-Total			100.3		%		80-120	26-SEP-18
Cobalt (Co)-Total			98.2		%		80-120	26-SEP-18
Copper (Cu)-Total			97.6		%		80-120	26-SEP-18
Iron (Fe)-Total			104.0		%		80-120	26-SEP-18
Lead (Pb)-Total			94.2		%		80-120	26-SEP-18
Lithium (Li)-Total			100.5		%		80-120	26-SEP-18
Manganese (Mn)-Total			99.5		%		80-120	26-SEP-18
Molybdenum (Mo)-Total			106.3		%		80-120	26-SEP-18
Nickel (Ni)-Total			96.5		%		80-120	26-SEP-18
Selenium (Se)-Total			99.1		%		80-120	26-SEP-18
Silver (Ag)-Total			92.5		%		80-120	26-SEP-18
Strontium (Sr)-Total			104.9		%		80-120	26-SEP-18
Thallium (Tl)-Total			95.6		%		80-120	26-SEP-18
Tin (Sn)-Total			94.3		%		80-120	26-SEP-18
Titanium (Ti)-Total			93.4		%		80-120	26-SEP-18
Uranium (U)-Total			96.2		%		80-120	26-SEP-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-NP-U-CCMS-ED	**Water**							
Batch R4250171								
WG2884841-14 LCS								
Vanadium (V)-Total			98.4		%		80-120	26-SEP-18
Zinc (Zn)-Total			96.5		%		80-120	26-SEP-18
Batch R4251942								
WG2884841-20 MS		**L2162579-20**						
Bismuth (Bi)-Total			81.7		%		70-130	29-SEP-18
NH3-L-CFA-ED	**Water**							
Batch R4247349								
WG2887943-13 DUP		**L2162579-12**						
Ammonia, Total (as N)		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	26-SEP-18
WG2887943-10 LCS								
Ammonia, Total (as N)			90.2		%		85-115	26-SEP-18
WG2887943-11 LCS								
Ammonia, Total (as N)			96.3		%		85-115	26-SEP-18
WG2887943-12 LCS								
Ammonia, Total (as N)			107.3		%		85-115	26-SEP-18
WG2887943-9 LCS								
Ammonia, Total (as N)			101.4		%		85-115	26-SEP-18
WG2887943-5 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	26-SEP-18
WG2887943-6 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	26-SEP-18
WG2887943-7 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	26-SEP-18
WG2887943-8 MB								
Ammonia, Total (as N)			<0.0050		mg/L		0.005	26-SEP-18
WG2887943-18 MS		**L2162579-12**						
Ammonia, Total (as N)			123.4		%		75-125	26-SEP-18
NO2-L-IC-N-ED	**Water**							
Batch R4216859								
WG2875838-11 LCS								
Nitrite (as N)			95.3		%		90-110	13-SEP-18
WG2875838-13 LCS								
Nitrite (as N)			95.5		%		90-110	14-SEP-18
WG2875838-15 LCS								
Nitrite (as N)			93.7		%		90-110	14-SEP-18
WG2875838-2 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-L-IC-N-ED	**Water**							
Batch R4216859								
WG2875838-2 LCS								
Nitrite (as N)			96.1		%		90-110	13-SEP-18
WG2875838-1 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	13-SEP-18
WG2875838-12 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	13-SEP-18
WG2875838-14 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	14-SEP-18
WG2875838-16 MB								
Nitrite (as N)			<0.0010		mg/L		0.001	14-SEP-18
NO3-L-IC-N-ED	**Water**							
Batch R4216859								
WG2875838-11 LCS								
Nitrate (as N)			98.9		%		90-110	13-SEP-18
WG2875838-13 LCS								
Nitrate (as N)			99.0		%		90-110	14-SEP-18
WG2875838-15 LCS								
Nitrate (as N)			98.0		%		90-110	14-SEP-18
WG2875838-2 LCS								
Nitrate (as N)			98.6		%		90-110	13-SEP-18
WG2875838-1 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	13-SEP-18
WG2875838-12 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	13-SEP-18
WG2875838-14 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	14-SEP-18
WG2875838-16 MB								
Nitrate (as N)			<0.0050		mg/L		0.005	14-SEP-18
P-T-L-COL-ED	**Water**							
Batch R4220108								
WG2878635-3 DUP		**L2162579-22**						
Phosphorus (P)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	18-SEP-18
WG2878635-2 LCS								
Phosphorus (P)-Total			88.4		%		80-120	18-SEP-18
WG2878635-6 LCS								
Phosphorus (P)-Total			91.2		%		80-120	18-SEP-18
WG2878635-1 MB								
Phosphorus (P)-Total			<0.0010		mg/L		0.001	18-SEP-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
P-T-L-COL-ED	**Water**							
Batch R4220108								
WG2878635-5 MB								
Phosphorus (P)-Total			<0.0010		mg/L		0.001	18-SEP-18
WG2878635-4 MS		**L2162579-22**						
Phosphorus (P)-Total			95.2		%		70-130	18-SEP-18
P-TD-L-COL-ED	**Water**							
Batch R4220108								
WG2878635-3 DUP		**L2162579-22**						
Phosphorus (P)-Total	Dissolved	<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	18-SEP-18
WG2878635-2 LCS								
Phosphorus (P)-Total	Dissolved		88.2		%		80-120	18-SEP-18
WG2878635-6 LCS								
Phosphorus (P)-Total	Dissolved		92.0		%		80-120	18-SEP-18
WG2878635-1 MB								
Phosphorus (P)-Total	Dissolved		<0.0010		mg/L		0.001	18-SEP-18
WG2878635-5 MB								
Phosphorus (P)-Total	Dissolved		<0.0010		mg/L		0.001	18-SEP-18
WG2878635-4 MS		**L2162579-22**						
Phosphorus (P)-Total	Dissolved		94.0		%		70-130	18-SEP-18
PH/EC/ALK-ED	**Water**							
Batch R4216074								
WG2876729-7 DUP		**L2162579-14**						
pH		6.82	6.81	J	pH	0.01	0.3	14-SEP-18
Conductivity (EC)		31.1	31.9		uS/cm	2.5	10	14-SEP-18
Bicarbonate (HCO3)		7.0	8.1		mg/L	15	25	14-SEP-18
Carbonate (CO3)		<5.0	<5.0	RPD-NA	mg/L	N/A	25	14-SEP-18
Hydroxide (OH)		<5.0	<5.0	RPD-NA	mg/L	N/A	25	14-SEP-18
Alkalinity, Total (as CaCO3)		5.7	6.6		mg/L	15	20	14-SEP-18
WG2876729-14 LCS		**MID_1412**						
Conductivity (EC)			99.2		%		90-110	14-SEP-18
WG2876729-16 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			113.0		%		85-115	14-SEP-18
WG2876729-17 LCS		**HI_12890**						
Conductivity (EC)			92.9		%		90-110	14-SEP-18
WG2876729-19 LCS		**MID_1412**						
Conductivity (EC)			100.0		%		90-110	14-SEP-18
WG2876729-2 LCS		**MID_1412**						
Conductivity (EC)			97.4		%		90-110	14-SEP-18
WG2876729-21 LCS		**PCTITRATE_LCS**						

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R4216074								
WG2876729-21 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			113.9		%		85-115	14-SEP-18
WG2876729-22 LCS		**HI_12890**						
Conductivity (EC)			94.8		%		90-110	14-SEP-18
WG2876729-24 LCS		**MID_1412**						
Conductivity (EC)			103.2		%		90-110	14-SEP-18
WG2876729-26 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			115.7	LCS-H	%		85-115	14-SEP-18
WG2876729-27 LCS		**HI_12890**						
Conductivity (EC)			94.6		%		90-110	14-SEP-18
WG2876729-29 LCS		**MID_1412**						
Conductivity (EC)			106.4		%		90-110	14-SEP-18
WG2876729-31 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			116.1	LCS-H	%		85-115	14-SEP-18
WG2876729-32 LCS		**HI_12890**						
Conductivity (EC)			95.5		%		90-110	14-SEP-18
WG2876729-34 LCS		**MID_1412**						
Conductivity (EC)			97.5		%		90-110	14-SEP-18
WG2876729-36 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			111.1		%		85-115	14-SEP-18
WG2876729-37 LCS		**HI_12890**						
Conductivity (EC)			94.6		%		90-110	14-SEP-18
WG2876729-4 LCS		**PCTITRATE_LCS**						
Alkalinity, Total (as CaCO3)			112.3		%		85-115	14-SEP-18
WG2876729-5 LCS		**HI_12890**						
Conductivity (EC)			94.2		%		90-110	14-SEP-18
WG2876729-1 MB								
Conductivity (EC)			<2.0		uS/cm		2	14-SEP-18
Bicarbonate (HCO3)			<5.0		mg/L		5	14-SEP-18
Carbonate (CO3)			<5.0		mg/L		5	14-SEP-18
Hydroxide (OH)			<5.0		mg/L		5	14-SEP-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	14-SEP-18
WG2876729-13 MB								
Conductivity (EC)			<2.0		uS/cm		2	14-SEP-18
Bicarbonate (HCO3)			<5.0		mg/L		5	14-SEP-18
Carbonate (CO3)			<5.0		mg/L		5	14-SEP-18
Hydroxide (OH)			<5.0		mg/L		5	14-SEP-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	14-SEP-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH/EC/ALK-ED	**Water**							
Batch R4216074								
WG2876729-18 MB								
Conductivity (EC)			<2.0		uS/cm		2	14-SEP-18
Bicarbonate (HCO3)			<5.0		mg/L		5	14-SEP-18
Carbonate (CO3)			<5.0		mg/L		5	14-SEP-18
Hydroxide (OH)			<5.0		mg/L		5	14-SEP-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	14-SEP-18
WG2876729-23 MB								
Conductivity (EC)			<2.0		uS/cm		2	14-SEP-18
Bicarbonate (HCO3)			<5.0		mg/L		5	14-SEP-18
Carbonate (CO3)			<5.0		mg/L		5	14-SEP-18
Hydroxide (OH)			<5.0		mg/L		5	14-SEP-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	14-SEP-18
WG2876729-28 MB								
Conductivity (EC)			<2.0		uS/cm		2	14-SEP-18
Bicarbonate (HCO3)			<5.0		mg/L		5	14-SEP-18
Carbonate (CO3)			<5.0		mg/L		5	14-SEP-18
Hydroxide (OH)			<5.0		mg/L		5	14-SEP-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	14-SEP-18
WG2876729-33 MB								
Conductivity (EC)			<2.0		uS/cm		2	14-SEP-18
Bicarbonate (HCO3)			<5.0		mg/L		5	14-SEP-18
Carbonate (CO3)			<5.0		mg/L		5	14-SEP-18
Hydroxide (OH)			<5.0		mg/L		5	14-SEP-18
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	14-SEP-18
PO4-DO-L-COL-ED	**Water**							
Batch R4215428								
WG2875470-10 LCS								
Orthophosphate-Dissolved (as P)			98.8		%		80-120	13-SEP-18
WG2875470-6 LCS								
Orthophosphate-Dissolved (as P)			98.8		%		80-120	13-SEP-18
WG2875470-5 MB								
Orthophosphate-Dissolved (as P)			<0.0010		mg/L		0.001	13-SEP-18
WG2875470-9 MB								
Orthophosphate-Dissolved (as P)			<0.0010		mg/L		0.001	13-SEP-18
SILICATE-COL-ED	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SILICATE-COL-ED	**Water**							
Batch R4217048								
WG2877816-2 LCS								
Silicate (as SiO2)			96.2		%		85-115	15-SEP-18
WG2877816-4 LCS								
Silicate (as SiO2)			100.8		%		85-115	15-SEP-18
WG2877816-1 MB								
Silicate (as SiO2)			<1.0		mg/L		1	15-SEP-18
WG2877816-3 MB								
Silicate (as SiO2)			<1.0		mg/L		1	15-SEP-18
SILICATE-L-COL-ED	**Water**							
Batch R4217050								
WG2877817-11 DUP		**L2162579-21**						
Silicate (as SiO2)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	15-SEP-18
WG2877817-7 DUP		**L2162579-12**						
Silicate (as SiO2)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	15-SEP-18
WG2877817-9 DUP		**L2162579-13**						
Silicate (as SiO2)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	15-SEP-18
WG2877817-2 LCS								
Silicate (as SiO2)			97.2		%		85-115	15-SEP-18
WG2877817-4 LCS								
Silicate (as SiO2)			91.6		%		85-115	15-SEP-18
WG2877817-6 LCS								
Silicate (as SiO2)			98.4		%		85-115	15-SEP-18
WG2877817-1 MB								
Silicate (as SiO2)			<0.010		mg/L		0.01	15-SEP-18
WG2877817-3 MB								
Silicate (as SiO2)			<0.010		mg/L		0.01	15-SEP-18
WG2877817-5 MB								
Silicate (as SiO2)			<0.010		mg/L		0.01	15-SEP-18
WG2877817-10 MS		**L2162579-13**						
Silicate (as SiO2)			87.1		%		80-120	15-SEP-18
WG2877817-12 MS		**L2162579-21**						
Silicate (as SiO2)			94.1		%		80-120	15-SEP-18
WG2877817-8 MS		**L2162579-12**						
Silicate (as SiO2)			96.3		%		80-120	15-SEP-18
SO4-L-IC-N-ED	**Water**							

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-L-IC-N-ED	**Water**							
Batch R4216859								
WG2875838-11 LCS								
Sulfate (SO4)			98.6		%		90-110	13-SEP-18
WG2875838-13 LCS								
Sulfate (SO4)			99.5		%		90-110	14-SEP-18
WG2875838-15 LCS								
Sulfate (SO4)			98.4		%		90-110	14-SEP-18
WG2875838-2 LCS								
Sulfate (SO4)			98.8		%		90-110	13-SEP-18
WG2875838-1 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	13-SEP-18
WG2875838-12 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	13-SEP-18
WG2875838-14 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	14-SEP-18
WG2875838-16 MB								
Sulfate (SO4)			<0.050		mg/L		0.05	14-SEP-18
SOLIDS-TDS-ED	**Water**							
Batch R4217443								
WG2876486-6 DUP		**L2162579-22**						
Total Dissolved Solids		<10	<10	RPD-NA	mg/L	N/A	20	14-SEP-18
WG2876486-2 LCS								
Total Dissolved Solids			98.9		%		85-115	14-SEP-18
WG2876486-5 LCS								
Total Dissolved Solids			98.6		%		85-115	14-SEP-18
WG2876486-1 MB								
Total Dissolved Solids			<10		mg/L		10	14-SEP-18
WG2876486-4 MB								
Total Dissolved Solids			<10		mg/L		10	14-SEP-18
SOLIDS-TOTSUS-ED	**Water**							
Batch R4217349								
WG2876456-6 DUP		**L2162579-22**						
Total Suspended Solids		<3.0	<3.0	RPD-NA	mg/L	N/A	20	14-SEP-18
WG2876456-2 LCS								
Total Suspended Solids			102.0		%		85-115	14-SEP-18
WG2876456-5 LCS								
Total Suspended Solids			103.8		%		85-115	14-SEP-18
WG2876456-1 MB								
Total Suspended Solids			<3.0		mg/L		3	14-SEP-18

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TOTSUS-ED	**Water**							
Batch R4217349								
WG2876456-4 MB								
Total Suspended Solids			<3.0		mg/L		3	14-SEP-18
SULPHIDE-CFA-ED	**Water**							
Batch R4216147								
WG2876172-15 DUP		**L2162579-11**						
Sulphide (as S)		0.0024	0.0022		mg/L	8.7	20	13-SEP-18
WG2876172-19 DUP		**L2162579-22**						
Sulphide (as S)		<0.0015	<0.0015	RPD-NA	mg/L	N/A	20	13-SEP-18
WG2876172-10 LCS								
Sulphide (as S)			96.3		%		75-125	13-SEP-18
WG2876172-14 LCS								
Sulphide (as S)			102.5		%		75-125	13-SEP-18
WG2876172-18 LCS								
Sulphide (as S)			86.5		%		75-125	13-SEP-18
WG2876172-2 LCS								
Sulphide (as S)			95.2		%		75-125	13-SEP-18
WG2876172-6 LCS								
Sulphide (as S)			98.5		%		75-125	13-SEP-18
WG2876172-1 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	13-SEP-18
WG2876172-13 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	13-SEP-18
WG2876172-17 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	13-SEP-18
WG2876172-5 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	13-SEP-18
WG2876172-9 MB								
Sulphide (as S)			<0.0015		mg/L		0.0015	13-SEP-18
WG2876172-16 MS		**L2162579-11**						
Sulphide (as S)			79.2		%		65-135	13-SEP-18
WG2876172-20 MS		**L2162579-22**						
Sulphide (as S)			84.0		%		65-135	13-SEP-18
TKN-L-CFA-ED	**Water**							
Batch R4259914								
WG2894559-3 DUP		**L2162579-11**						
Total Kjeldahl Nitrogen		0.297	0.203	J	mg/L	0.094	0.1	04-OCT-18
WG2894559-2 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TKN-L-CFA-ED	**Water**							
Batch R4259914								
WG2894559-2 LCS								
Total Kjeldahl Nitrogen			101		%		75-125	04-OCT-18
WG2894559-6 LCS								
Total Kjeldahl Nitrogen			101		%		75-125	04-OCT-18
WG2894559-1 MB								
Total Kjeldahl Nitrogen			<0.050		mg/L		0.05	04-OCT-18
WG2894559-5 MB								
Total Kjeldahl Nitrogen			<0.050		mg/L		0.05	04-OCT-18
WG2894559-4 MS		**L2162579-11**						
Total Kjeldahl Nitrogen			97		%		70-130	04-OCT-18
Batch R4263035								
WG2895785-3 DUP		**L2162579-22**						
Total Kjeldahl Nitrogen		<0.050	<0.050	RPD-NA	mg/L	N/A	20	05-OCT-18
WG2895785-2 LCS								
Total Kjeldahl Nitrogen			96		%		75-125	05-OCT-18
WG2895785-1 MB								
Total Kjeldahl Nitrogen			<0.050		mg/L		0.05	05-OCT-18
TURBIDITY-ED	**Water**							
Batch R4215575								
WG2875955-3 DUP		**L2162579-12**						
Turbidity		0.13	0.17	J	NTU	0.050	0.2	13-SEP-18
WG2875955-2 LCS								
Turbidity			98.6		%		95-105	13-SEP-18
WG2875955-5 LCS								
Turbidity			98.6		%		95-105	13-SEP-18
WG2875955-1 MB								
Turbidity			<0.10		NTU		0.1	13-SEP-18
WG2875955-4 MB								
Turbidity			<0.10		NTU		0.1	13-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.
LCS-H	Lab Control Sample recovery was above ALS DQO. Non-detected sample results are considered reliable. Other results, if reported, have been qualified.
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							
Color, True							
	1	07-SEP-18 15:30	13-SEP-18 13:00	3	6	days	EHTR
	2	07-SEP-18 14:30	13-SEP-18 13:00	3	6	days	EHTR
	3	07-SEP-18 14:00	13-SEP-18 13:00	3	6	days	EHTR
	4	07-SEP-18 12:15	13-SEP-18 13:00	3	6	days	EHTR
	5	07-SEP-18 13:00	13-SEP-18 13:00	3	6	days	EHTR
	6	07-SEP-18 17:00	13-SEP-18 13:00	3	6	days	EHTR
	7	08-SEP-18 13:00	13-SEP-18 13:00	3	5	days	EHTR
	8	08-SEP-18 12:30	13-SEP-18 13:00	3	5	days	EHTR
	9	08-SEP-18 12:00	13-SEP-18 13:00	3	5	days	EHTR
	10	08-SEP-18 11:15	13-SEP-18 13:00	3	5	days	EHTR
	11	08-SEP-18 10:45	13-SEP-18 13:00	3	5	days	EHTR
	12	08-SEP-18 12:20	13-SEP-18 13:00	3	5	days	EHTR
	13	09-SEP-18 12:05	13-SEP-18 13:00	3	4	days	EHTL
	14	09-SEP-18 12:00	13-SEP-18 13:00	3	4	days	EHTL
	15	09-SEP-18 12:20	13-SEP-18 13:00	3	4	days	EHTL
	16	09-SEP-18 13:00	13-SEP-18 13:00	3	4	days	EHTL
	17	09-SEP-18 13:15	13-SEP-18 13:00	3	4	days	EHTL
	18	09-SEP-18 14:20	13-SEP-18 13:00	3	4	days	EHTL
	19	09-SEP-18 13:35	13-SEP-18 13:00	3	4	days	EHTL
	20	09-SEP-18 14:00	13-SEP-18 13:00	3	4	days	EHTL
	21	09-SEP-18 14:20	13-SEP-18 13:00	3	4	days	EHTL
	22	08-SEP-18 12:35	13-SEP-18 13:00	3	5	days	EHTR
Turbidity							
	1	07-SEP-18 15:30	13-SEP-18 15:50	3	6	days	EHTR
	2	07-SEP-18 14:30	13-SEP-18 15:50	3	6	days	EHTR
	3	07-SEP-18 14:00	13-SEP-18 15:50	3	6	days	EHTR
	4	07-SEP-18 12:15	13-SEP-18 15:50	3	6	days	EHTR
	5	07-SEP-18 13:00	13-SEP-18 15:50	3	6	days	EHTR
	6	07-SEP-18 17:00	13-SEP-18 15:50	3	6	days	EHTR
	7	08-SEP-18 13:00	13-SEP-18 15:50	3	5	days	EHTR
	8	08-SEP-18 12:30	13-SEP-18 15:50	3	5	days	EHTR
	9	08-SEP-18 12:00	13-SEP-18 15:50	3	5	days	EHTR
	10	08-SEP-18 11:15	13-SEP-18 15:50	3	5	days	EHTR
	11	08-SEP-18 10:45	13-SEP-18 15:50	3	5	days	EHTR
	12	08-SEP-18 12:20	13-SEP-18 15:50	3	5	days	EHTR
	13	09-SEP-18 12:05	13-SEP-18 15:50	3	4	days	EHTL
	14	09-SEP-18 12:00	13-SEP-18 15:50	3	4	days	EHTL
	15	09-SEP-18 12:20	13-SEP-18 15:50	3	4	days	EHTL
	16	09-SEP-18 13:00	13-SEP-18 15:50	3	4	days	EHTL
	17	09-SEP-18 13:15	13-SEP-18 15:50	3	4	days	EHTL
	18	09-SEP-18 14:20	13-SEP-18 15:50	3	4	days	EHTL
	19	09-SEP-18 13:35	13-SEP-18 15:50	3	4	days	EHTL
	20	09-SEP-18 14:00	13-SEP-18 15:50	3	4	days	EHTL
	21	09-SEP-18 14:20	13-SEP-18 15:50	3	4	days	EHTL
	22	08-SEP-18 12:35	13-SEP-18 15:50	3	5	days	EHTR
Leachable Anions & Nutrients							
Diss. Orthophosphate in Water by Colour							
	1	07-SEP-18 15:30	13-SEP-18 00:00	3	5	days	EHTR
	2	07-SEP-18 14:30	13-SEP-18 00:00	3	5	days	EHTR
	3	07-SEP-18 14:00	13-SEP-18 00:00	3	5	days	EHTR
	4	07-SEP-18 12:15	13-SEP-18 00:00	3	5	days	EHTR
	5	07-SEP-18 13:00	13-SEP-18 00:00	3	5	days	EHTR
	6	07-SEP-18 17:00	13-SEP-18 00:00	3	5	days	EHTR
	7	08-SEP-18 13:00	13-SEP-18 00:00	3	4	days	EHTR
	8	08-SEP-18 12:30	13-SEP-18 00:00	3	4	days	EHTR
	9	08-SEP-18 12:00	13-SEP-18 00:00	3	5	days	EHTR
	10	08-SEP-18 11:15	13-SEP-18 00:00	3	5	days	EHTR

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Leachable Anions & Nutrients							
Diss. Orthophosphate in Water by Colour							
	11	08-SEP-18 10:45	13-SEP-18 00:00	3	5	days	EHTR
	12	08-SEP-18 12:20	13-SEP-18 00:00	3	4	days	EHTR
	13	09-SEP-18 12:05	13-SEP-18 00:00	3	4	days	EHTL
	14	09-SEP-18 12:00	13-SEP-18 00:00	3	4	days	EHTL
	22	08-SEP-18 12:35	13-SEP-18 00:00	3	4	days	EHTR
Anions and Nutrients							
Nitrate in Water by IC (Low Level)							
	1	07-SEP-18 15:30	13-SEP-18 08:00	3	6	days	EHTR
	2	07-SEP-18 14:30	13-SEP-18 08:00	3	6	days	EHTR
	3	07-SEP-18 14:00	13-SEP-18 08:00	3	6	days	EHTR
	4	07-SEP-18 12:15	13-SEP-18 08:00	3	6	days	EHTR
	5	07-SEP-18 13:00	13-SEP-18 08:00	3	6	days	EHTR
	6	07-SEP-18 17:00	13-SEP-18 08:00	3	6	days	EHTR
	7	08-SEP-18 13:00	13-SEP-18 08:00	3	5	days	EHTR
	8	08-SEP-18 12:30	13-SEP-18 08:00	3	5	days	EHTR
	9	08-SEP-18 12:00	13-SEP-18 08:00	3	5	days	EHTR
	10	08-SEP-18 11:15	13-SEP-18 08:00	3	5	days	EHTR
	11	08-SEP-18 10:45	13-SEP-18 08:00	3	5	days	EHTR
	12	08-SEP-18 12:20	13-SEP-18 08:00	3	5	days	EHTR
	13	09-SEP-18 12:05	13-SEP-18 08:00	3	4	days	EHTL
	14	09-SEP-18 12:00	13-SEP-18 08:00	3	4	days	EHTL
	15	09-SEP-18 12:20	13-SEP-18 08:00	3	4	days	EHTL
	16	09-SEP-18 13:00	13-SEP-18 08:00	3	4	days	EHTL
	17	09-SEP-18 13:15	13-SEP-18 08:00	3	4	days	EHTL
	18	09-SEP-18 14:20	13-SEP-18 08:00	3	4	days	EHTL
	19	09-SEP-18 13:35	13-SEP-18 08:00	3	4	days	EHTL
	20	09-SEP-18 14:00	13-SEP-18 08:00	3	4	days	EHTL
	21	09-SEP-18 14:20	13-SEP-18 08:00	3	4	days	EHTL
	22	08-SEP-18 12:35	13-SEP-18 08:00	3	5	days	EHTR
Nitrite in Water by IC (Low Level)							
	1	07-SEP-18 15:30	13-SEP-18 08:00	3	6	days	EHTR
	2	07-SEP-18 14:30	13-SEP-18 08:00	3	6	days	EHTR
	3	07-SEP-18 14:00	13-SEP-18 08:00	3	6	days	EHTR
	4	07-SEP-18 12:15	13-SEP-18 08:00	3	6	days	EHTR
	5	07-SEP-18 13:00	13-SEP-18 08:00	3	6	days	EHTR
	6	07-SEP-18 17:00	13-SEP-18 08:00	3	6	days	EHTR
	7	08-SEP-18 13:00	13-SEP-18 08:00	3	5	days	EHTR
	8	08-SEP-18 12:30	13-SEP-18 08:00	3	5	days	EHTR
	9	08-SEP-18 12:00	13-SEP-18 08:00	3	5	days	EHTR
	10	08-SEP-18 11:15	13-SEP-18 08:00	3	5	days	EHTR
	11	08-SEP-18 10:45	13-SEP-18 08:00	3	5	days	EHTR
	12	08-SEP-18 12:20	13-SEP-18 08:00	3	5	days	EHTR
	13	09-SEP-18 12:05	13-SEP-18 08:00	3	4	days	EHTL
	14	09-SEP-18 12:00	13-SEP-18 08:00	3	4	days	EHTL
	15	09-SEP-18 12:20	13-SEP-18 08:00	3	4	days	EHTL
	16	09-SEP-18 13:00	13-SEP-18 08:00	3	4	days	EHTL
	17	09-SEP-18 13:15	13-SEP-18 08:00	3	4	days	EHTL
	18	09-SEP-18 14:20	13-SEP-18 08:00	3	4	days	EHTL
	19	09-SEP-18 13:35	13-SEP-18 08:00	3	4	days	EHTL
	20	09-SEP-18 14:00	13-SEP-18 08:00	3	4	days	EHTL
	21	09-SEP-18 14:20	13-SEP-18 08:00	3	4	days	EHTL
	22	08-SEP-18 12:35	13-SEP-18 08:00	3	5	days	EHTR
Cyanides							
Free Cyanide in water by CFA							
	10	08-SEP-18 11:15	24-SEP-18 12:16	14	16	days	EHT
	13	09-SEP-18 12:05	24-SEP-18 12:16	14	15	days	EHT

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Cyanides							
Free Cyanide in water by CFA							
	14	09-SEP-18 12:00	24-SEP-18 12:16	14	15	days	EHT
	15	09-SEP-18 12:20	24-SEP-18 12:16	14	15	days	EHT
	16	09-SEP-18 13:00	24-SEP-18 12:16	14	15	days	EHT
	17	09-SEP-18 13:15	24-SEP-18 12:16	14	15	days	EHT
	18	09-SEP-18 14:20	25-SEP-18 05:15	14	16	days	EHT
	19	09-SEP-18 13:35	25-SEP-18 05:15	14	16	days	EHT
	20	09-SEP-18 14:00	25-SEP-18 05:15	14	16	days	EHT
	21	09-SEP-18 14:20	25-SEP-18 05:15	14	16	days	EHT
Total Cyanide in water by CFA							
	10	08-SEP-18 11:15	24-SEP-18 11:53	14	16	days	EHT
	13	09-SEP-18 12:05	24-SEP-18 11:53	14	15	days	EHT
	14	09-SEP-18 12:00	24-SEP-18 11:53	14	15	days	EHT
	15	09-SEP-18 12:20	24-SEP-18 11:53	14	15	days	EHT
	16	09-SEP-18 13:00	24-SEP-18 11:53	14	15	days	EHT
	17	09-SEP-18 13:15	24-SEP-18 11:53	14	15	days	EHT
	18	09-SEP-18 14:20	25-SEP-18 05:15	14	16	days	EHT
	19	09-SEP-18 13:35	25-SEP-18 05:15	14	16	days	EHT
	20	09-SEP-18 14:00	25-SEP-18 05:15	14	16	days	EHT
	21	09-SEP-18 14:20	25-SEP-18 05:15	14	16	days	EHT
Weak Acid Diss. Cyanide in water by CFA							
	10	08-SEP-18 11:15	24-SEP-18 12:07	14	16	days	EHT
	13	09-SEP-18 12:05	24-SEP-18 12:07	14	15	days	EHT
	14	09-SEP-18 12:00	24-SEP-18 12:07	14	15	days	EHT
	15	09-SEP-18 12:20	24-SEP-18 12:07	14	15	days	EHT
	16	09-SEP-18 13:00	24-SEP-18 12:07	14	15	days	EHT
	17	09-SEP-18 13:15	24-SEP-18 12:07	14	15	days	EHT
	18	09-SEP-18 14:20	25-SEP-18 05:15	14	16	days	EHT
	19	09-SEP-18 13:35	25-SEP-18 05:15	14	16	days	EHT
	20	09-SEP-18 14:00	25-SEP-18 05:15	14	16	days	EHT
	21	09-SEP-18 14:20	25-SEP-18 05:15	14	16	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 L2162579 were received on 12-SEP-18 09:30.

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.

Chain of Custody (COC) / Analytical Request Form

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Canada Toll Free: 1 800 668 9878

L2162579-COFC

COC Number: 14 -

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Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Golder Associates Ltd.	Select Report Format:	☑PDF ☑EXCEL ☑EDD (DIGITAL)	R ☑Regular (Standard TAT if received by 3 pm - business days)
Contact:	Zenovia Craciunescu/Kerrie Serben	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	16820 107 Avenue Edmonton, Alberta, Canada T5P 4C3	☐Criteria on Report - provide details below if box checked		E ☐Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT
Phone:	+1 780 930 6786/ +1 306 667 1531	Select Distribution:	☑EMAIL ☐MAI ☐FAX	E2 ☐Same day or weekend emergency - contact ALS to confirm TAT and surcharge
		Email 1 or Fax	mkeefe@sabinagoldsilver.com	Specify Date Required for E2,E or P:
		Email 2	zcraciunescu@golder.com; Kerrie_Serben@golder.com	Analysis Request

Invoice To	Same as Report To ☐ Yes ☑ No	Invoice Distribution		
	Copy of Invoice with Report ☐ Yes ☑ No	Select Invoice Distribution:	☑EMAIL ☐MAIL ☐FAX	
Company:	Sabina Gold and Silver	Email 1 or Fax	mkeefe@sabinagoldsilver.com	
Contact:	Merle Keefe (604 998 4190) mkeefe@sabinagoldsilver.com	Email 2		

Project Information		Oil and Gas Required Fields (client use)	
ALS Bottle Order	BR210169/ Quote: Q63297	Approver ID:	Cost Center:
Job #:	1787890/2300	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	

ALS Lab Work Order # (lab use only) L2162579 | **ALS Contact:** Jessica Spira | **Sampler:**

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	GLD-CAL-WQ-MET-DU-ED (Filtered (F))	GLD-CAL-WQ-MET-TU-ED	GLD-CAL-WQ-NUT-ED (Preserved (P))	GLD-CAL-WQ-ROU-ED	HG-D-U-CVAF-VA (Filtered (F))	HG-T-U-CVAF-VA	N-T-CALC-ED	PO4-DO-L-COL-ED	SILICATE-L-COL-ED	Cyanides (Preserved (P))	Radium-226 (Preserved (P))	Chlorophyll a	Number of Containers
1	BRP-29-1	07-Sept-18	15:30	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
2	BRP-29-2	07-Sept-18	14:30	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
3	BRP-29-3	07-Sept-18	14:00	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
4	BRP-29-4	07-Sept-18	12:15	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
5	BRP-29-5	07-Sept-18	13:00	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
6	BRP-29-6	07-Sept-18	17:00	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
7	BRP-40-1	08-Sept-18	13:00	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
8	BRP-40-2	08-Sept-18	12:30	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
9	BRP-40-3	08-Sept-18	12:00	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
10	BRP-40-4	08-Sept-18	11:15	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
11	BRP-40-5	08-Sept-18	10:45	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
12	FB-L	08-Sept-18	12:20	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11

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

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

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

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

Filtered: Dissolved nutrients, dissolved metals, dissolved Hg

Preserved: Nutrients, cyanide, radium, sulfide

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		
6.2					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Sarah Beattie	Date: Sept. 11/18	Time: 15:00	Received by:	Date: Sep 12/18	Time: 0930	Received by:	Date:	Time:

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Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 14 -

Page 2 of 2

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	Golder Associates Ltd.	Select Report Format:	☑PDF ☑EXCEL ☑EDD (DIGITAL)	R ☑Regular (Standard TAT if received by 3 pm - business days)
Contact:	Zenovia Craciunescu/Kerrie Serben	Quality Control (QC) Report with Report	☑ Yes ☐ No	P ☐Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT
Address:	16820 107 Avenue Edmonton, Alberta, Canada T5P 4C3	☐Criteria on Report - provide details below if box checked Select Distribution:	☑EMAIL ☐MAI ☐FAX	E ☐Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 ☐Same day or weekend emergency - contact ALS to confirm TAT and surcharge
Phone:	+1 780 930 6786/ +1 306 667 1531	Email 1 or Fax	mkeefe@sabinagoldsilver.com	Specify Date Required for E2,E or P:
		Email 2	zcraciunescu@golder.com; Kerrie_Serben@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:	Sabina Gold and Silver	Email 1 or Fax	mkeefe@sabinagoldsilver.com	
Contact:	Merle Keefe (604 998 4190) mkeefe@sabinagoldsilver.com	Email 2		

Project Information		Oil and Gas Required Fields (client use)	
ALS Bottle Order	BR210169/ Quote: Q63297	Approver ID:	Cost Center:
Job #:	1787890/2300	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)		ALS Contact: Jessica Spira	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	GLD-CAL-WQ-MET-DU-ED Filtered (F)	GLD-CAL-WQ-MET-TU-ED	GLD-CAL-WQ-NUT-ED Preserved (P)	GLD-CAL-WQ-ROU-ED	HG-D-U-CVAF-VA Filtered (F)	HG-T-U-CVAF-VA	N-T-CALC-ED	PO4-DO-L-COL-ED	SILICATE-L-COL-ED	Cyanides Preserved (P)	Radium-226 Preserved (P)	Chlorophyll a	Number of Containers
13	FB-S	09-Sept-18	12:05	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
14	BRP-39(1)	09-Sept-18	12:00	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
15	BRP-39(2)	09-Sept-18	12:20	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
16	BRP-34(1)	09-Sept-18	13:00	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
17	BRP-34(2)	09-Sept-18	13:15	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
18	BRP-19	09-Sept-18	14:20	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
19	BRP-18	09-Sept-18	13:35	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
20	BRP-23	09-Sept-18	14:00	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
21	TB-S	09-Sept-18	14:20	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
22	TB-L	09-Sept-18	12:35	Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	11
				Water													
				Water													

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

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

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

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

Filtered: Dissolved nutrients, dissolved metals, dissolved Hg

Preserved: Nutrients, cyanide, radium, sulfide

SAMPLE CONDITION AS RECEIVED (lab use only)

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

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Simon Beattie	Date: Sept 11/18	Time: 15:00	Received by:	Date:	Time:	Received by:	Date:	Time:

Appendix C Back River Project Engagement Record

Record of Meetings and Major Correspondence with Community and Stakeholder Groups

Date	Individual(s) / Organization	Type of Activity
Cambridge Bay		
February 14, 2012	Brenda Sitatak HTO Manager	Introductions and information sharing.
February 14, 2012	Renee Krucas Executive Director, Kitikmeot Heritage Society	Introductions and information sharing.
February 14, 2012	Connie Kapolak High School Principal	Introductions and information sharing.
March 27, 2012	Brenda Sitatak HTO Manager	Introductions and update.
March 27, 2012	Stephen King, Senior Administrative Officer Jim McEchrean, Economic Development Officer Hamlet of Cambridge Bay	Project introduction.
April 5, 2012	Renee Krucas Executive Director, Kitikmeot Heritage Society	Letter / invitation to nominate representatives to the Cambridge Bay Community Advisory Group.
April 5, 2012	Stephen King, Senior Administrative Officer Hamlet of Cambridge Bay	Letter / invitation to nominate representative to the Cambridge Bay Community Advisory Group.
April 5, 2012	Brenda Sitatak HTO Manager	Letter / invitation to nominate representative to the Cambridge Bay Community Advisory Group.
June 14, 2012	General public	Call-in radio show.
June 14, 2012	Jessie Lyall, HTO Board Member Brenda Sitatak, HTO Manager	Project introduction.
June 14, 2012	General public	Public meeting - Project overview.
June 14, 2012	Hamlet Council and administration	Project introduction.
June 15, 2012	Cambridge Bay Community Advisory Group	Project introduction.
September 11-12, 2012	Cambridge Bay Community Advisory Group	Sabina hosted a dinner and meeting for the Cambridge Bay and Kugluktuk Community Advisory Groups (CAGs) in Cambridge Bay on September 11, 2012. The CAGs also visited the Back River Project site on September 12, 2012.
September 27-29, 2012	Interviews conducted with a number of individuals representing a variety of interests in the community including: government administration; health, wellness and social services; safety and protection services; business and economic development; and education and training	Socio-economic baseline data collection; documentation of expected Project benefits, Project concerns, and suggested mitigation measures.
November 19, 2012	General public	Call-in radio show.

November 19, 2012	High school students and staff	Mining and geology presentation.
November 19, 2012	General public	Public open house.
November 19, 2012	Cambridge Bay Community Advisory Group	Project update.
November 30 - December 1, 2012	Local hunters from Cambridge Bay	Land use focus group.
February 5-6, 2013	General public	Sabina representatives participated in NIRB's scoping meetings for the Project and were available to the public for questions and information sharing.
February 5, 2013	Cambridge Bay Community Advisory Group	Project update.
April 23, 2013	General public	Public meeting - Project overview/update.
April 23, 2013	Cambridge Bay HTO	Project overview/update.
August 20, 2013	General public	Sabina provided an overview of the Back River Project and its traditional knowledge study.
August 20, 2013	General public	The Kitikmeot Inuit Association provided an overview of the Naonaiyaotit Traditional Knowledge Project (NTKP) report completed for the Back River Project and additional traditional knowledge workshops being conducted.
August 21, 2013	Cambridge Bay Community Advisory Group	Project update and review of Inuinnaqtun terminology for traditional seasons.
August 21-23, 2013	Selected elders and knowledge holders	A series of traditional knowledge workshops were held with selected elders and local knowledge holders for Sabina's traditional knowledge study. These workshops focused on the topics of 'heritage and land use', 'terrestrial environment' and 'marine environment'.
November 19, 2013	General public	Public meeting - Project overview/update & DEIS submission overview.
November 19, 2013	Cambridge Bay Community Advisory Group	Project update.
November 19, 2013	Cambridge Bay high school students	Project overview and discussion of future employment opportunities.
November 19, 2013	General public	Radio update.
January 23, 2014	General public	Career fair participation.
February 2014	Kitikmeot Heritage Society	Letter – Update on January 2014 DEIS submission to NIRB and NWB. DEIS Plain Language Summary included.
February 2014	Cambridge Bay Community Advisory Group	Letter – Update on January 2014 DEIS submission to NIRB and NWB. DEIS Plain Language Summary included.
February 2014	Hamlet of Cambridge Bay	Letter – Update on January 2014 DEIS submission to NIRB and NWB. DEIS Plain Language Summary included.

February 2014	Cambridge Bay HTO	Letter – Update on January 2014 DEIS submission to NIRB and NWB. DEIS Plain Language Summary included.
March 25, 2014	General public	NIRB held community information sessions for the Project's DEIS and were available to the public for questions and information sharing. Note – Sabina representatives were unable to attend due to flight cancellations.
March 28, 2014	Cambridge Bay Community Advisory Group	Project update.
April 27, 2014	General public	Radio update / call-in radio show.
April 28, 2014	Jim McEchrean, Economic Development Officer, Hamlet of Cambridge Bay	Project update.
April 28, 2014	Brendan Griebel, Executive Director, Kitikmeot Heritage Society	Introductions and Project update/overview.
April 28, 2014	General public	Radio update / call-in radio show.
June 7-10, 2014	Selected elders and knowledge holders	A series of traditional knowledge interviews were held with selected elders and local knowledge holders as a component of proposed fish offsetting activities in the Bernard Harbour, Nunavut area.
July 14-15, 2014	Cambridge Bay Community Advisory Group	Sabina hosted the Cambridge Bay and Kugluktuk Community Advisory Groups at the Back River Project site on July 14-15. Site tours were provided and Project information was shared.
October 28,2014	Hamlet of Cambridge Bay	Project update.
November 20, 2014	Cambridge Bay Community Readiness Initiative Committee	Sabina met with Cambridge Bay's Community Readiness Initiative Committee.
December 18, 2014	Cambridge Bay Community Readiness Initiative Committee	Sabina met with Cambridge Bay's Community Readiness Initiative Committee.
February 5, 2015	Cambridge Bay high school students	Project overview and discussion of future employment opportunities.
February 9, 2015	Kitikmeot Heritage Society representatives	Project update and discussion of potential future donations.
February 9, 2015	Gordon Bligh, Arctic College	Project update and discussion of mine-related training/education.
March 10, 2015	Cambridge Bay Community Readiness Initiative Committee	Sabina met with Cambridge Bay's Community Readiness Initiative Committee.
April 7, 2015	Cambridge Bay Community Readiness Initiative Committee	Sabina met with Cambridge Bay's Community Readiness Initiative Committee.
May 10, 2015	Cambridge Bay Community Readiness Initiative Committee	Sabina met with Cambridge Bay's Community Readiness Initiative Committee.

June 15, 2015	Cambridge Bay Community Advisory Group	Project update and FEIS submission overview.
June 16, 2015	Hamlet of Cambridge Bay Representatives	Project update and FEIS submission overview.
June 16, 2015	General public	Public meeting – Project update and FEIS submission overview.
October 7, 2015	Cambridge Bay HTO	Project update and FEIS submission overview.
February 10, 2016	Cambridge Bay Community Advisory Group	Project update and FEIS submission/NIRB final hearings overview.
March 5, 2016	Hamlet of Cambridge Bay Cambridge Bay HTO	Emailed letter re: Sabina's FEIS submission.
April 11-12, 2016	Cambridge Bay HTO Representative Cambridge Bay Community Wellness Centre Representative	Representatives from the Cambridge Bay HTO and Community Wellness Centre participated in meetings and a Back River Project site visit hosted by Sabina.
July 6, 2016	Cambridge Bay Community Advisory Group	Project update re: NIRB final hearing report.
July 6, 2016	General Public	Public Meeting – Project update re: NIRB final hearing report.
July 7, 2016	Cambridge Bay HTO	Project update re: NIRB final hearing report.
September 15, 2016	General Public	Sabina participated in the Cambridge Bay portion of the 2016 Kitikmeot Career Fair.
September 19, 2016	Hamlet of Cambridge Bay	Project update re: NIRB final hearing report (Sabina representatives participated in-person and via teleconference).
November 30, 2016	General Public	Project update and update on revised Wildlife Mitigation and Monitoring Program.
December 1, 2016	Cambridge Bay HTO	Project update and update on revised Wildlife Mitigation and Monitoring Program.
December 1, 2016	General Public	Sabina representatives set up an informational table at the Co-op regarding the revised Wildlife Mitigation and Monitoring Program.
December 1, 2016	Cambridge Bay Community Advisory Group	Project update and update on revised Wildlife Mitigation and Monitoring Program.
January 23, 2017	Cambridge Bay Community Advisory Group members (various) Past Project employee	Letter – Update on January 12, 2017 INAC Minister's decision and thank you for providing letter of support.
April 21, 2017	Cambridge Bay HTO	Project update and FEIS Addendum overview.
April 21, 2017	Hamlet of Cambridge Bay Representatives	Project update and FEIS Addendum overview.
April 21, 2017	General Public	Public meeting - Project update and FEIS Addendum overview.

September 2017	Various Parties (e.g. Hamlet of Cambridge Bay, selected Cambridge Bay Community Advisory Group members, individual)	Letter – Project update and thank you for providing letter of support.
October 2, 2017	General public	Career fair participation.
Kugluktuk		
April 11, 2012	Barbara Adjun HTO Manager	Letter / invitation to nominate representative to the Kugluktuk Community Advisory Group.
April 26, 2013	Donald LeBlanc, Senior Administrative Officer Hamlet of Kugluktuk	Letter / invitation to nominate representative to the Kugluktuk Community Advisory Group.
June 12, 2012	Kugluktuk HTO	Project introduction.
June 12, 2012	General public	Public meeting - Project overview.
June 13, 2012	Donald LeBlanc, Senior Administrative Officer Hamlet of Kugluktuk	Project introduction.
June 13, 2012	Kugluktuk Community Advisory Group	Project introduction.
September 11-12, 2012	Kugluktuk Community Advisory Group	Sabina hosted a dinner and meeting for the Kugluktuk and Cambridge Bay Community Advisory Groups (CAGs) in Cambridge Bay on September 11, 2012. The CAGs also visited the Back River Project site on September 12, 2012.
October 1-3, 2012	Interviews conducted with a number of individuals representing a variety of interests in the community including: government administration; health, wellness and social services; safety and protection services; business and economic development; and education and training	Socio-economic baseline data collection; documentation of expected Project benefits, Project concerns, and suggested mitigation measures.
November 21, 2012	High school students and staff	Mining and geology presentation.
November 21, 2012	General public	Public meeting - Project overview/update.
November 21, 2012	Kugluktuk Community Advisory Group	Project update.
November 27, 2012	Local hunters from Kugluktuk	Land use focus group.
February 7-8, 2013	General public	Sabina representatives participated in NIRB's scoping meetings for the Project and were available to the public for questions and information sharing.
February 8, 2013	Kugluktuk Community Advisory Group	Project update.
April 22, 2013	General public	Public meeting - Project overview/update.
April 22, 2013	Kugluktuk Community Advisory Group	Project update.
August 12, 2013	General public	Sabina provided an overview of the Back River Project and its traditional knowledge study.

August 13, 2013	General public	The Kitikmeot Inuit Association provided an overview of the Naonaiyaotit Traditional Knowledge Project (NTKP) report completed for the Back River Project and additional traditional knowledge workshops being conducted.
August 14-16, 2013	Selected elders and knowledge holders	A series of traditional knowledge workshops were held with selected elders and local knowledge holders for Sabina's traditional knowledge study. These workshops focused on the topics of 'heritage and land use', 'terrestrial environment' and 'marine environment'.
November 18, 2013	General public	Public meeting - Project overview/update & DEIS submission overview.
November 18, 2013	Kugluktuk Hamlet Council	Project update.
November 18, 2013	Kugluktuk Community Advisory Group	Project update.
November 18, 2013	Kugluktuk high school students	Project overview and discussion of future employment opportunities.
January 24, 2014	General public	Career fair participation.
February 12, 2014	Donald LeBlanc, Senior Administrative Officer Hamlet of Kugluktuk	Letter / invitation to nominate representative to the Kugluktuk Community Advisory Group.
February 2014	Kugluktuk Community Advisory Group	Letter – Update on January 2014 DEIS submission to NIRB and NWB. DEIS Plain Language Summary included.
February 2014	Hamlet of Kugluktuk	Letter – Update on January 2014 DEIS submission to NIRB and NWB. DEIS Plain Language Summary included.
February 2014	Kugluktuk HTO	Letter – Update on January 2014 DEIS submission to NIRB and NWB. DEIS Plain Language Summary included.
March 19, 2014	David Nivingalok (Chairperson) and Kevin Klengenberg (Secretary-Treasurer), Kugluktuk HTO	Teleconference to discuss proposed fish offsetting work to be conducted at Bernard Harbour.
March 24, 2014	General public	Sabina representatives participated in NIRB's community information sessions for the Project's DEIS and were available to the public for questions and information sharing.
March 24, 2014	Kugluktuk Community Advisory Group	Project update.
March 25, 2014	Kugluktuk HTO	Meeting to discuss proposed fish offsetting work to be conducted at Bernard Harbour and the associated TK study.
April 29, 2014	Kugluktuk HTO	Meeting to discuss Kugluktuk HTO-Sabina Bernard Harbour Restoration Project Agreement.
April 30, 2014	Kugluktuk Community Readiness Initiative Committee	Sabina met with Kugluktuk's Community Readiness Initiative Committee in Kugluktuk to discuss the plans and goals of the committee and how Sabina might contribute.

April 30, 2014	Donald LeBlanc, SAO, Hamlet of Kugluktuk	Project update.
May 2, 2014	Kugluktuk Community Readiness Initiative Committee	Sabina met with Kugluktuk's Community Readiness Initiative Committee in Yellowknife to discuss the plans and goals of the committee and how Sabina might contribute.
June 1-6, 2014	Selected elders and knowledge holders	A series of traditional knowledge interviews were held with selected elders and local knowledge holders as a component of proposed fish offsetting activities in the Bernard Harbour, Nunavut area. A project overview meeting/presentation was also held with local study participants prior to the interviews commencing.
July 13, 2014	Bernard Harbour TK study participants, HTO chairperson, and acting HTO manager	A TK study results verification meeting was held with participants in the Bernard Harbour TK study and with the Kugluktuk HTO chairperson and acting manager. Various clarifications were made by the participants, which were later incorporated into the final TK study report.
July 14-15, 2014	Kugluktuk Community Advisory Group	Sabina hosted the Cambridge Bay and Kugluktuk Community Advisory Groups at the Back River Project site on July 14-15. Site tours were provided and Project information was shared.
July 17, 2014	Kugluktuk HTO chairperson	The chairperson of the Kugluktuk HTO accompanied Sabina representatives and various other attendees during a day-long site visit to the Bernard Harbour stream restoration project.
February 12, 2015	Kugluktuk Community Advisory Group	Sabina provided a Project update and administered a country food consumption questionnaire.
February 12, 2015	Kugluktuk HTO representatives	Sabina met with the Kugluktuk HTO chairperson, treasurer, and manager to provide an update on the Bernard Harbour restoration project and Bernard Harbour TK study.
February 17, 2015	Kugluktuk HTO	Letter and copy of the draft 'Traditional Knowledge Study Report on the Arctic Char Fishery in the Nulahugyuk Creek – Hingittok Lake Area (Bernard Harbour), Nunavut' provided to the HTO.
April 21, 2015	Kugluktuk HTO	Final copy of the 'Traditional Knowledge Study Report on the Arctic Char Fishery in the Nulahugyuk Creek – Hingittok Lake Area (Bernard Harbour), Nunavut' provided to the HTO.
May 8, 2015	Barbara Adjun, Kugluktuk HTO Manager	Phone update on the Bernard Harbour restoration project.
May 21, 2015	David Nivingalok, Kugluktuk HTO Chairperson	Phone update on the Bernard Harbour restoration project.
May 27, 2015	Hamlet of Kugluktuk	Sabina participated (via teleconference) in a multi-stakeholder information session hosted on Kugluktuk's

		Community Readiness Initiative where feedback was sought on the draft Kugluktuk Community Readiness Report.
June 17, 2015	General public	Public meeting – Project update and FEIS submission overview. The results of the Bernard Harbour TK study and plans for the Bernard Harbour restoration project were also reviewed.
June 18, 2015	Kugluktuk Community Advisory Group	Project update and FEIS submission overview.
June 18, 2015	Kugluktuk HTO	Project update and FEIS submission overview. The results of the Bernard Harbour TK study and plans for the Bernard Harbour restoration project were also reviewed.
June 19, 2015	Hamlet of Kugluktuk	Project update and FEIS submission overview.
July 8, 2015	David Nivingalok, Kugluktuk HTO Chairperson	Letter providing information on the 2015 Bernard Harbour work proposal.
February 11, 2016	Kugluktuk HTO	Project update and FEIS submission/NIRB final hearings overview. Bernard Harbour project update.
February 12, 2016	Kugluktuk Community Advisory Group	Project update and FEIS submission/NIRB final hearings overview.
March 5, 2016	Hamlet of Kugluktuk Kugluktuk HTO	Emailed letter re: Sabina's FEIS submission.
March 16-17, 2016	Kugluktuk Job Fair and Graduation Ceremony	Sabina participated in a job fair and graduation ceremonies in Kugluktuk.
April 11-12, 2016	Kugluktuk HTO Representatives	Representatives from the Kugluktuk HTO participated in meetings and a Back River Project site visit hosted by Sabina.
June 7, 2016	General Public	Public Meeting on the Bernard Harbour Restoration Project
June 8-9, 2016	Kugluktuk HTO and Invited Participants	Bernard Harbour Restoration Project Workshop
June 17, 2016	Kugluktuk HTO	Teleconference Project update re: NIRB final hearing report.
July 5, 2016	Hamlet of Kugluktuk	Project update re: NIRB final hearing report.
July 5, 2016	General Public	Public meeting – Project update re: NIRB final hearing report.
July 6, 2016	Kugluktuk Community Advisory Group	Project update re: NIRB final hearing report.
September 16, 2016	General Public	Sabina participated in the Kugluktuk portion of the 2016 Kitikmeot Career Fair.
November 9, 2016	Kugluktuk HTO	Sabina provided a Bernard Harbour Restoration Project update by teleconference.

December 2, 2016	Kugluktuk HTO	Project update, Bernard Harbour project update, and update on revised Wildlife Mitigation and Monitoring Program
December 3, 2016	General Public	Call-in radio show - Project update and update on revised Wildlife Mitigation and Monitoring Program
December 3, 2016	General Public	Project update and update on revised Wildlife Mitigation and Monitoring Program
December 4, 2016	Kugluktuk Community Advisory Group	Project update and update on revised Wildlife Mitigation and Monitoring Program
January 23, 2017	Hamlet of Kugluktuk Kugluktuk HTO Three elders Community member	Letter – Update on January 12, 2017 INAC Minister's decision and thank you for providing letter of support.
April 24, 2017	Hamlet of Kugluktuk	Project update and FEIS Addendum overview.
April 24, 2017	Kugluktuk HTO	Project update and FEIS Addendum overview.
April 24, 2017	General Public	Public meeting - Project update and FEIS Addendum overview.
September 2017	Various Parties (e.g. Hamlet of Kugluktuk, Kugluktuk HTO, selected Elders, individual)	Letter – Project update and thank you for providing letter of support.
October 5, 2017	General public	Career fair participation.
Kingaok and Omingmaktok		
April 5, 2012	Sam Kapolak, Chairperson Bathurst Inlet HTO	Letter / invitation to nominate representative to the Cambridge Bay Community Advisory Group.
April 5, 2012	Peter Kapolak, Chairperson Omingmaktok HTO	Letter / invitation to nominate representative to the Cambridge Bay Community Advisory Group.
November 18, 2012	Various residents of Kingaok and Omingmaktok	Sabina hosted a Project information meeting in Cambridge Bay specifically for residents of Kingaok and Omingmaktok.
November 30 - December 1, 2012	Local hunters from the Bathurst Inlet area	Land use focus group.
Fall 2012	Interviews conducted with selected individuals from the Bathurst Inlet area for Sabina's socio-economic study	Socio-economic baseline data collection; documentation of expected Project benefits, Project concerns, and suggested mitigation measures.
January 1, 2013	Boyd Warner President, Bathurst Inlet Lodge	Project discussion (via phone).
August 14-16, 2013 (in Kugluktuk) August 21-23 (in Cambridge Bay)	Selected elders and knowledge holders from or familiar with the Bathurst Inlet area	A series of traditional knowledge workshops were held with selected elders and local knowledge holders for Sabina's traditional knowledge study. These workshops focused on the topics of 'heritage and land use', 'terrestrial environment' and 'marine environment'.

November 19, 2013	Various residents of Kingaok and Omingmaktok	Project update in Cambridge Bay specifically for residents of Kingaok and Omingmaktok and the Cambridge Bay community advisory group.
February 2014	Omingmaktok HTO	Letter – Update on January 2014 DEIS submission to NIRB and NWB. DEIS Plain Language Summary included.
September 24, 2014	Residents of Kingaok and Omingmaktok	Letter / invitation to attend October 28, 2014 dinner and meeting on the Back River Project in Cambridge Bay, specifically for residents of Kingaok and Omingmaktok.
October 28, 2014	Residents of Kingaok and Omingmaktok	Dinner and meeting on the Back River Project in Cambridge Bay, specifically for residents of Kingaok and Omingmaktok.
January 21, 2015	Residents of Kingaok and Omingmaktok	Letter / invitation to attend February 8, 2015 dinner and meeting on the Back River Project in Cambridge Bay, specifically for residents of Kingaok and Omingmaktok.
May 21, 2015	Residents of Kingaok and Omingmaktok	Letter / invitation to attend June 15, 2015 dinner and meeting on the Back River Project in Cambridge Bay, specifically for residents of Kingaok and Omingmaktok.
June 15, 2015	Residents of Kingaok and Omingmaktok	Dinner and meeting on the Back River Project (re: Project update and FEIS submission overview) in Cambridge Bay, specifically for residents of Kingaok and Omingmaktok.
February 9, 2016	Residents of Kingaok and Omingmaktok	Dinner and meeting on the Back River Project (re: Project update, FEIS submission, and NIRB final hearings overview) in Cambridge Bay, specifically for residents of Kingaok and Omingmaktok.
March 5, 2016	Bathurst Inlet HTO Bay Chimo HTO	Emailed letter re: Sabina's FEIS submission.
April 11-12, 2016	Bathurst Inlet HTO Representative Bay Chimo HTO Representative	Representatives from the Bathurst Inlet HTO and Bay Chimo HTO participated in meetings and a Back River Project site visit hosted by Sabina.
December 1, 2016	Residents of Kingaok and Omingmaktok	Project update and update on revised Wildlife Mitigation and Monitoring Program
April 23, 2017	Kingaok and Omingmaktok Representatives	Project update and FEIS Addendum overview.
Gjoa Haven		
June 20, 2012	Hamlet Council members and staff	Project introduction.
June 20, 2012	General public	Public meeting - Project overview.
September 17-19, 2012	Interviews conducted with a number of individuals representing a variety of interests in the community including: government administration; health, wellness and social services; business and economic development; and education and training	Socio-economic baseline data collection; documentation of expected Project benefits, Project concerns, and suggested mitigation measures.

February 12, 2013	General public	Sabina representatives participated in NIRB's scoping meeting for the Project and were available to the public for questions and information sharing.
February 13, 2013	General public	Radio Show - Project update and notice of upcoming Actua educational program for Kitikmeot youth.
April 24, 2013	General public	Public meeting - Project overview/update.
April 24, 2013	Gjoa Haven HTO	Project overview/update.
April 24, 2013	General public	Radio Show - Project update.
November 20, 2013	General public	Public meeting - Project overview/update & DEIS submission overview.
November 20, 2013	Gjoa Haven HTO	Project update.
November 20, 2013	Hamlet of Gjoa Haven representatives	Project update.
November 20, 2013	Gjoa Haven high school students	Project overview and discussion of future employment opportunities.
November 20, 2013	General public	Radio update.
January 21, 2014	General public	Career fair participation.
February 2014	Hamlet of Gjoa Haven	Letter – Update on January 2014 DEIS submission to NIRB and NWB. DEIS Plain Language Summary included.
February 2014	Gjoa Haven HTO	Letter – Update on January 2014 DEIS submission to NIRB and NWB. DEIS Plain Language Summary included.
March 26, 2014	General public	NIRB held community information sessions for the Project's DEIS and were available to the public for questions and information sharing. Note – Sabina representatives were unable to attend due to flight cancellations.
March 5, 2016	Hamlet of Gjoa Haven Gjoa Haven HTO	Emailed letter re: Sabina's FEIS submission.
March 7, 2016	Hamlet of Gjoa Haven Gjoa Haven HTO Residents of Gjoa Haven	Emailed letter re: recent attempts by Sabina to host a public meeting in Gjoa Haven.
April 11-12, 2016	Hamlet of Gjoa Haven Representative Kitikmeot Inuit Association (Gjoa Haven) Representative	Representatives from the Hamlet of Gjoa Haven and Kitikmeot Inuit Association (Gjoa Haven) participated in meetings and a Back River Project site visit hosted by Sabina.
July 8, 2016	Hamlet of Gjoa Haven representatives	Project update re: NIRB final hearing report.
July 8, 2016	General Public	Public meeting - Project update re: NIRB final hearing report.
January 23, 2017	Hamlet of Gjoa Haven Past Project employees (various)	Letter – Update on January 12, 2017 INAC Minister's decision and thank you for providing letter of support.

April 18, 2017	Hamlet of Gjoa Haven	Project update and FEIS Addendum overview.
April 18, 2017	General Public	Public meeting - Project update and FEIS Addendum overview.
September 2017	Various Parties (e.g. Hamlet of Gjoa Haven, individuals)	Letter – Project update and thank you for providing letter of support.
Taloyoak		
June 19, 2012	General public	Public meeting - Project overview.
June 19, 2012	Taloyoak HTO	Project overview.
June 19, 2012	Tommy Aiyout, Mayor of Taloyoak David Irqquit, Assistant SAO Hamlet of Taloyoak	Project overview.
September 25-26, 2012	Interviews conducted with a number of individuals representing a variety of interests in the community including: government administration; health, wellness and social services; safety and protection services; business and economic development; and education and training	Socio-economic baseline data collection; documentation of expected Project benefits, Project concerns, and suggested mitigation measures.
February 13, 2013	General public	Sabina representatives participated in NIRB's scoping meeting for the Project and were available to the public for questions and information sharing.
February 14, 2013	General public	Radio Show - Project update and notice of upcoming Actua educational program for Kitikmeot youth.
April 25, 2013	General public	Public meeting - Project overview/update.
April 25, 2013	General public	Radio Show - Project update.
November 21, 2013	General public	Public meeting - Project overview/update & DEIS submission overview.
November 21, 2013	Taloyoak HTO	Project update.
November 21, 2013	Taloyoak Hamlet Council	Project update.
November 21, 2013	Taloyoak high school students	Project overview and discussion of future employment opportunities.
November 21, 2013	General public	Radio update.
January 20, 2014	General public	Career fair participation.
February 2014	Hamlet of Taloyoak	Letter – Update on January 2014 DEIS submission to NIRB and NWB. DEIS Plain Language Summary included.
February 2014	Taloyoak HTO	Letter – Update on January 2014 DEIS submission to NIRB and NWB. DEIS Plain Language Summary included.
March 28, 2014	General public	NIRB held community information sessions for the Project's DEIS and were available to the public for

		questions and information sharing. Note – Sabina representatives were unable to attend due to flight cancellations.
June 17, 2015	General public	Public meeting – Project update and FEIS submission overview.
June 17, 2015	Hamlet of Taloyoak	Project update and FEIS submission overview.
March 5, 2016	Hamlet of Taloyoak Taloyoak HTO	Emailed letter re: Sabina's FEIS submission.
April 11-12, 2016	Hamlet of Taloyoak Representative Taloyoak HTO Representative	Representatives from the Hamlet of Taloyoak and Taloyoak HTO participated in meetings and a Back River Project site visit hosted by Sabina.
July 7, 2016	Taloyoak HTO	Project update re: NIRB final hearing report.
July 7, 2016	Hamlet of Taloyoak representatives	Project update re: NIRB final hearing report.
July 7, 2016	General Public	Public meeting - Project update re: NIRB final hearing report.
January 23, 2017	Hamlet of Taloyoak	Letter – Update on January 12, 2017 INAC Minister's decision and thank you for providing letter of support.
April 20, 2017	Taloyoak HTO	Project update and FEIS Addendum overview.
April 20, 2017	Hamlet of Taloyoak Representatives	Project update and FEIS Addendum overview.
April 20, 2017	General Public	Public meeting - Project update and FEIS Addendum overview.
September 2017	Hamlet of Taloyoak	Letter – Project update and thank you for providing letter of support.
October 3, 2017	General public	Career fair participation.
Kugaaruk		
June 18, 2012	General public	Public meeting - Project overview.
September 20-21, 2012	Interviews conducted with a number of individuals representing a variety of interests in the community including: government administration; health, wellness and social services; safety and protection services; business and economic development; and education and training	Socio-economic baseline data collection; documentation of expected Project benefits, Project concerns, and suggested mitigation measures.
February 11, 2013	General public	Sabina representatives participated in NIRB's scoping meeting for the Project and were available to the public for questions and information sharing.
February 11, 2013	General public	Radio Show - Project update and notice of upcoming Actua educational program for Kitikmeot youth.
April 26, 2013	General public	Public meeting - Project overview/update.
April 26, 2013	General public	Radio Show - Project update.

April 26, 2013	Kugaaruk Hamlet Council	Project overview/update.
November 22, 2013	General public	Public meeting - Project overview/update & DEIS submission overview.
November 22, 2013	Kugaaruk Hamlet Council	Project update.
November 22, 2013	Kugaaruk high school students	Project overview and discussion of future employment opportunities.
November 22, 2013	General public	Radio update.
January 22, 2014	General public	Career fair participation.
February 2014	Hamlet of Kugaaruk	Letter – Update on January 2014 DEIS submission to NIRB and NWB. DEIS Plain Language Summary included.
February 2014	Kugaaruk HTO	Letter – Update on January 2014 DEIS submission to NIRB and NWB. DEIS Plain Language Summary included.
March 27, 2014	General public	NIRB held community information sessions for the Project's DEIS and were available to the public for questions and information sharing. Note – Sabina representatives were unable to attend due to flight cancellations.
June 16, 2015	General public	Public meeting – Project update and FEIS submission overview.
March 5, 2016	Hamlet of Kugaaruk Kugaaruk HTO	Emailed letter re: Sabina's FEIS submission.
April 11-12, 2016	Hamlet of Kugaaruk Representative Kugaaruk HTO Representative	Representatives from the Hamlet of Kugaaruk and Kugaaruk HTO participated in meetings and a Back River Project site visit hosted by Sabina.
July 6, 2016	Kugaaruk HTO	Project update re: NIRB final hearing report.
July 6, 2016	Hamlet of Kugaaruk	Project update re: NIRB final hearing report.
July 6, 2016	General Public	Public meeting - Project update re: NIRB final hearing report.
January 23, 2017	Hamlet of Kugaaruk	Letter – Update on January 12, 2017 INAC Minister's decision and thank you for providing letter of support.
April 19, 2017	General Public	Public meeting - Project update and FEIS Addendum overview.
September 2017	Hamlet of Kugaaruk	Letter – Project update and thank you for providing letter of support.
Yellowknife / Other Locations in the Northwest Territories		
November 15, 2012	Yellowknives Dene First Nation representatives	Project overview.
November 16, 2012	General public	Public meeting – Project overview.

February 20, 2013	General public	Sabina representatives participated in NIRB's scoping meeting for the Project and were available to the public for questions and information sharing.
November 12, 2013	Tlicho Government / Kwe Beh Working Group representatives	Project overview.
November 13, 2013	Deninu K'ue First Nation representatives	Project overview.
November 13, 2013	General public	Public meeting - Project overview/update.
November 14, 2013	Yellowknives Dene First Nation representative (T. Slack)	Project update.
November 15, 2013	North Slave Métis Alliance representatives	Project overview.
January 24, 2013	Yellowknives Dene First Nation (Attn: Todd Slack)	Delivery of two USB memory sticks with full digital versions of Sabina's DEIS submission included on each.
January 24, 2013	Tlicho Government / Kwe Beh Working Group (Attn: Henry Zoe and Sonny Zoe)	Delivery of two USB memory sticks with full digital versions of Sabina's DEIS submission included on each.
January 24, 2013	North Slave Métis Alliance (Attn: Eric Binion)	Delivery of two USB memory sticks with full digital versions of Sabina's DEIS submission included on each.
January 24, 2013	Deninu K'ue First Nation (Attn: Chief Louis Balsillie and Stephen Cuthbert)	Delivery of two USB memory sticks with full digital versions of Sabina's DEIS submission included on each.
April 1, 2014	General public	Sabina representatives participated in NIRB's community information sessions for the Project's DEIS and were available to the public for questions and information sharing.
May 8, 2014	Yellowknives Dene First Nation	Email update re: DEIS / NIRB regulatory process.
May 8, 2014	Tlicho Government / Kwe Beh Working Group	Email update re: DEIS / NIRB regulatory process.
May 8, 2014	North Slave Métis Alliance	Email update re: DEIS / NIRB regulatory process.
May 8, 2014	Lutsel K'e Dene First Nation	Email update re: DEIS / NIRB regulatory process.
May 8, 2014	Deninu K'ue First Nation	Email update re: DEIS / NIRB regulatory process.
May 8, 2014	Dene Nation	Email update re: DEIS / NIRB regulatory process.
July 24, 2014	Yellowknives Dene First Nation	Email update re: Sabina's DEIS IR responses.
July 24, 2014	Tlicho Government / Kwe Beh Working Group	Email update re: Sabina's DEIS IR responses.
July 24, 2014	North Slave Métis Alliance	Email update re: Sabina's DEIS IR responses.
July 24, 2014	Lutsel K'e Dene First Nation	Email update re: Sabina's DEIS IR responses.
July 24, 2014	Deninu K'ue First Nation	Email update re: Sabina's DEIS IR responses.
July 24, 2014	Dene Nation	Email update re: Sabina's DEIS IR responses.
July 25, 2014	North Slave Métis Alliance representative (Matt Hoover)	Phone call to discuss Sabina's DEIS Information Request responses and future regulatory timelines/requirements.
May 28, 2015	Yellowknives Dene First Nation	Emailed letter and notice of June 15, 2015 public meeting in Yellowknife.

May 28, 2015	Tlicho Government	Emailed letter and notice of June 15, 2015 public meeting in Yellowknife.
May 28, 2015	Deninu Kue First Nation	Emailed letter and notice of June 15, 2015 public meeting in Yellowknife.
May 28, 2015	North Slave Métis Alliance	Emailed letter and notice of June 15, 2015 public meeting in Yellowknife.
May 28, 2015	Lutsel K'e Dene First Nation	Emailed letter and notice of June 15, 2015 public meeting in Yellowknife.
June 15, 2015	General public	Public meeting - Project update and FEIS submission overview.
February 8, 2016	North Slave Métis Alliance	Project / FEIS update meeting.
March 5, 2016	Yellowknives Dene First Nation	Emailed letter re: Sabina's FEIS submission.
March 5, 2016	Tlicho Government / Kwe Beh Working Group	Emailed letter re: Sabina's FEIS submission.
March 5, 2016	North Slave Métis Alliance	Emailed letter re: Sabina's FEIS submission.
March 5, 2016	Lutsel K'e Dene First Nation	Emailed letter re: Sabina's FEIS submission.
July 8, 2016	North Slave Métis Alliance	Project update re: NIRB final hearing report.
July 8, 2016	General Public	Public meeting - Project update re: NIRB final hearing report.
April 17, 2017	General public	Public meeting - Project update and FEIS Addendum overview.
April 25, 2017	Yellowknives Dene First Nation Representatives	Project update and FEIS Addendum overview.
Other (e.g. northern trade shows and conferences, SEMCs, newsletters)		
February 13-15, 2012	Various community, government, and industry stakeholders participated	Sabina participated in the Kitikmeot Trade Show in Cambridge Bay.
March 28, 2012	Various community, government, and industry stakeholders participated	Sabina participated in the Kitikmeot Socio-Economic Monitoring Committee meeting in Cambridge Bay.
April 16-19, 2012	Various community, government, and industry stakeholders participated	Sabina participated in the Nunavut Mining Symposium in Iqaluit.
September 25-27, 2012	Various community, government, and industry stakeholders participated	Sabina participated in the Nunavut Trade Show in Iqaluit.
October 30-31, 2012	Various community, government, and industry stakeholders participated	Sabina participated in the Kitikmeot Stakeholders Meeting in Cambridge Bay to discuss training and labour market needs in the Kitikmeot Region.
November 13-15, 2012	Various community, government, and industry stakeholders participated	Sabina participated in the Yellowknife Geoscience Forum.
March 30, 2013	Various community, government, industry, and other stakeholders	Sabina issued the winter 2013 edition of its Project newsletter 'Back River News' via email and at various locations in the Kitikmeot communities.

February 11-13, 2013	Various community, government, and industry stakeholders participated	Sabina participated in the Kitikmeot Trade Show in Cambridge Bay.
April 8-11, 2013	Various community, government, and industry stakeholders participated	Sabina participated in the Nunavut Mining Symposium in Iqaluit.
June 28, 2013	Various community, government, industry, and other stakeholders	Sabina issued the summer 2013 edition of its Project newsletter 'Back River News' via email and at various locations in the Kitikmeot communities.
September 12, 2013	Various community, government, and industry stakeholders participated	Sabina participated in a meeting on Community Readiness in the Kitikmeot Region, hosted by the Kitikmeot Inuit Association and Canadian Northern Economic Development Agency, in Cambridge Bay.
September 24-26, 2013	Various community, government, and industry stakeholders participated	Sabina participated in the Nunavut Trade Show in Iqaluit.
October 9, 2013	Various community, government, industry, and other stakeholders	Sabina provided an email update on the results of its pre-feasibility study for the Back River Project.
October 18, 2013	Various community, government, and industry stakeholders participated	Sabina participated (via teleconference) in the Kitikmeot Stakeholders Working Group meeting in Cambridge Bay to discuss training and employment activities and opportunities in the Kitikmeot Region.
November 15, 2013	Various community, government, industry, and other stakeholders	Sabina issued the fall 2013 edition of its Project newsletter 'Back River News' via email and at various locations in the Kitikmeot communities.
November 19-21, 2013	Various community, government, and industry stakeholders participated	Sabina participated in the Yellowknife Geoscience Forum.
November 20-21, 2013	Various community, government, and industry stakeholders participated	Sabina participated in the Kitikmeot Socio-Economic Monitoring Committee meeting in Cambridge Bay.
December 3, 2013	Various community, government, and industry stakeholders participated	Sabina participated (via teleconference) in the Kitikmeot Stakeholders Working Group meeting in Cambridge Bay to discuss training and employment activities and opportunities in the Kitikmeot Region.
January 22, 2014	Various community, government, industry, and other stakeholders	Sabina issued the spring 2014 edition of its Project newsletter 'Back River News' via email and at various locations in the Kitikmeot communities.
February 10-12, 2014	Various community, government, and industry stakeholders participated	Sabina participated in the Kitikmeot Trade Show in Cambridge Bay.
February 12, 2014	Various community, government, industry, and other stakeholders	Sabina provided an email update on the DEIS conformity decision it received for the Back River Project.
February 18, 2014	Various community, government, and industry stakeholders participated	Sabina participated (via teleconference) in the Kitikmeot Stakeholders Working Group meeting in Cambridge Bay to discuss training and employment activities and opportunities in the Kitikmeot Region.

March 4, 2014	Various community, government, industry, and other stakeholders	Sabina provided an email update on the updated mineral resource estimate it produced for the Back River Project.
April 7-10, 2014	Various community, government, and industry stakeholders participated	Sabina participated in the Nunavut Mining Symposium in Iqaluit.
April 28, 2014	Various community, government, industry, and other stakeholders	Sabina provided an email update on recent agreements signed between Sabina and the KIA for the Back River Project.
June 5, 2014	Various community, government, and industry stakeholders participated	Sabina participated (via teleconference) in the Kitikmeot Stakeholders Working Group meeting in Cambridge Bay to discuss training and employment activities and opportunities in the Kitikmeot Region.
October 7-9, 2014	Various community, government, and industry stakeholders participated	Sabina participated in the Nunavut Trade Show in Iqaluit.
October 22, 2014	Various community, government, and industry stakeholders participated	Sabina participated (via teleconference) in the Kitikmeot Stakeholders Working Group meeting in Cambridge Bay to discuss training and employment activities and opportunities in the Kitikmeot Region.
November 13-19, 2014	Various community and government stakeholders participated	Sabina participated in the Nunavut Impact Review Board's Technical Meeting and Pre-Hearing Conference for the Back River Project in Cambridge Bay.
November 25-27, 2014	Various community, government, and industry stakeholders participated	Sabina participated in the Yellowknife Geoscience Forum.
January 13, 2015	Various community, government, industry, and other stakeholders	Email update to Sabina email distribution list re: environmental assessment progress and anticipated FEIS submission.
January 27, 2015	Various community, government, industry, and other stakeholders	Sabina issued the winter 2015 edition of its Project newsletter 'Back River News' via email and at various locations in the Kitikmeot communities.
February 4, 2015	Various government and KIA representatives participated	Sabina participated in a meeting in Cambridge Bay to establish a Terms of Reference for the Back River Socio-Economic Monitoring Committee Working Group.
February 9-11, 2015	Various community, government, and industry stakeholders participated	Sabina participated in the Kitikmeot Trade Show in Cambridge Bay.
April 13-16, 2015	Various community, government, and industry stakeholders participated	Sabina participated in the Nunavut Mining Symposium in Iqaluit.
April 21-23, 2015	Various community, government, and industry stakeholders participated	Sabina participated in the Kitikmeot Mayors' Conference in Cambridge Bay.
September 14, 2015	Various community, government, industry, and other stakeholders	Email update to Sabina email distribution list re: Initial Project Feasibility Study.

November 3-4, 2015	Various community, government, and industry stakeholders participated	Sabina participated in the Kitikmeot Socio-Economic Monitoring Committee meeting in Cambridge Bay.
December 9, 2015	Various community, government, industry, and other stakeholders	Email update to Sabina email distribution list re: FEIS submission.
February 9, 2016	Selected youth from the Kitikmeot Region	Sabina met with selected youth from the Kitikmeot Region who were participating in the Kitikmeot Trade Show, to discuss education and career opportunities.
February 9-10, 2016	Various community, government, and industry stakeholders participated	Sabina participated in and presented a Project update at the Kitikmeot Trade Show in Cambridge Bay.
February 17, 2016	Various community, government, industry, and other stakeholders	Sabina issued the winter 2016 edition of its Project newsletter 'Back River News' via email and at various locations in the Kitikmeot communities.
April 4-6, 2016	Various community, government, and industry stakeholders participated	Sabina participated in the Nunavut Mining Symposium in Iqaluit.
April 19-21, 2016	Various community, government, and industry stakeholders participated	Sabina participated in the Kitikmeot Mayors' Conference in Cambridge Bay.
April 25-30, 2016	Various community and government stakeholders participated	Sabina participated in the Nunavut Impact Review Board's Final Hearing for the Back River Project in Cambridge Bay.
November 15-17, 2016	Various community, government, and industry stakeholders participated	Sabina participated in the Yellowknife Geoscience Forum in Yellowknife.
November 30-December 1, 2016	Various community, government, and industry stakeholders participated	Sabina participated in the Kitikmeot Socio-Economic Monitoring Committee meeting in Cambridge Bay.
December 2, 2016	Back River Socio-Economic Monitoring Working Group Members	Sabina participated in a Back River Socio-Economic Monitoring Working Group meeting in Cambridge Bay.
February 6-8, 2017	Various community, government, and industry stakeholders participated	Sabina participated in the Kitikmeot Trade Show in Cambridge Bay.
April 3-6, 2017	Various community, government, and industry stakeholders participated	Sabina participated in the Nunavut Mining Symposium in Iqaluit.
May 31-June 3, 2017	Various community and government stakeholders participated	Sabina participated in the Nunavut Impact Review Board's FEIS Addendum Final Hearing for the Back River Project in Cambridge Bay.
September 14-15, 2017	Various community, government, and industry stakeholders participated	Sabina participated in a Socio-Economic Monitoring Workshop held in Iqaluit.
October 3-5, 2017	Various community, government, and industry stakeholders participated	Sabina participated in the Kitikmeot Mayors' Conference in Cambridge Bay.
November 14-16, 2017	Various community, government, and industry stakeholders participated	Sabina participated in the Yellowknife Geoscience Forum in Yellowknife.

November 21-23, 2017	Various community, government, and industry stakeholders participated	Sabina participated in the Kitikmeot Economic Development Strategy Workshop hosted by the Kitikmeot Chamber of Commerce in Cambridge Bay
March 19-20, 2018	Various community, government, and industry stakeholders participated	Sabina participated in the Kitikmeot Socio-Economic Development Meeting in Cambridge Bay
March 20, 2018	Various community, government, and industry stakeholders participated	Sabina participated in the Back River Socio-Economic Meeting Working Group in Cambridge Bay
May 2, 2018	Various community, government and Industry stakeholders participated	Sabina participated in the Community Meeting for the Nunavut Water Board during Type A Water Licence Technical Meetings
May 10, 2019	Various community, government and Industry stakeholders participated	Sabina participated in the KIA's Stakeholders Working Group in Cambridge Bay
August 3, 2018	Hamlet of Kugluktuk	Sabina met with the Hamlet to discuss infrastructure projects in Kugluktuk
August 8, 2018	Various community, government and Industry stakeholders participated	Sabina participated in the Community Meeting for the Nunavut Water Board during Type A Water Licence Final Hearing in Cambridge Bay
September 18, 2018	Various community, government and Industry stakeholders participated	Sabina participated in the KIA's Stakeholders Working Group in Cambridge Bay
September 19, 2018	Various community, government and Industry stakeholders participated	Sabina participated in the Kitikmeot Mayors Meeting In Cambridge Bay
October 17, 2018	Hamlet of Cambridge Bay	Sabina met with the SAO for a Community Update
October 18, 2018	Various community, government and Industry stakeholders participated	Sabina participated in the Kitikmeot Inuit Association Annual General Meeting in Cambridge Bay

Appendix D Road Management Plan



BACK RIVER PROJECT
Road Management Plan

Type B Development Works Water Licence

April 2018

Version 2.0

EXECUTIVE SUMMARY

Road Management Plan

This Plan describes the road management procedures to be used at the Back River Project. This Plan outlines the procedures to be employed related to all-weather, ice road, and airstrip design, construction and use. It specifies requirements related to road inspection, maintenance and monitoring as well as mitigation and management measures related to dust, snow clearing, permafrost degradation, fish and fish habitat, wildlife and incident response.

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BACK RIVER PROJECT
ROAD MANAGEMENT PLAN

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Appendix A. Applicable Legislation

Acronyms

DFO	Department of Fisheries and Oceans
FEIS	Final Environmental Impact Statement
GPR	Ground Penetrating Radar
INAC	Indigenous and Northern Affairs Canada
KIA	Kitikmeot Inuit Association
MLA	Marine Laydown Area
NWB	Nunavut Water Board
Project	Back River Project
RCMP	Royal Canadian Mounted Police
RMP or Plan	Road Management Plan
ROQ	run of quarry
Sabina	Sabina Gold & Silver Corp.
WIR	Winter Ice Road

1. Introduction

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) within the West Kitikmeot region of southwestern Nunavut. It is situated approximately 400 km southwest of Cambridge Bay, 95 km southeast of the southern end of Bathurst Inlet, and 520 km northeast of Yellowknife, Northwest Territories. The Project is located predominantly within the Queen Maud Gulf Watershed (Nunavut Water Regulations, Schedule 4).

The Project is comprised of two main areas with interconnecting winter ice roads (WIR): Goose Property (Appendix A of the MASD, base Figure 2) and the Marine Laydown Area (MLA) (Appendix A of the MASD, base Figure 3) situated along the western shore of southern Bathurst Inlet. The majority of annual resupply will be completed using the MLA, and an approximately 160 km long WIR will interconnect these sites.

The Road Management Plan (RMP or Plan) outlines the approach for construction, operations, and reclamation of transportation infrastructure, such as all-weather roads and WIRs. This plan includes provisions for the MLA and the Goose Property. The RMP is intended to support the Type B Water Licence Application for the Project.

The Plan was prepared following the requirements of:

- the Supplementary Information Guidelines (SIG) for Mining and Milling MM3 and Water Works M1, issued by Nunavut Water Board (NWB 2010 a, b);
- the Environmental Impact Statement Guidelines issued by the Nunavut Impact Review Board to Sabina (NIRB 2013); and
- in accordance with best management practices and in conformance with current Federal and Territorial statutory requirements.

The information presented herein is current as of August, 2017.

2. Scope and Objectives

This Road Management Plan has been written to meet requirements of a Type B Water Licence and entails the construction, operation, and management of all-weather service roads and WIRs in relation to the site preparation and development work activities as described in Table 2-1. The Plan is supported by a suite of Project-specific mitigation, monitoring, and/or management plans that set out the Project's standards and requirements for particular areas of environmental management, including the:

- Comprehensive Spill Contingency Plan (August 2017);
- Fuel Management Plan (August 2017);
- Road Management Plan (August 2017);
- Quarry Management Plan (August 2017);
- Oil Pollution Emergency Plan (August 2017);
- Environmental Management and Protection Plan (August 2017); and
- Interim Closure and Reclamation Plan and cost estimate (August 2017) specific to development works.

Included within the plans are monitoring with adaptive management measures to confirm that the Project is executed as planned, that mitigation is successful, and potential adverse effects are minimized.

Table 2-1. List of Activities

GOOSE PROPERTY
Goose Exploration Camp Operation
Ice Airstrip Construction and Operation
Mobilize Fuel, Equipment, and Supplies
Winter Ice Road Construction and Operation
Operate Airstrip Quarry
Operate Umwelt Quarry
Locate Temporary Fuel Storage
Construct All-weather Service Roads and Water Crossings
Construct Goose Plant Site and Fuel Storage Area Pad
Airstrip Extension
Rascal Stream Re-alignment
Relocate Explosives Storage Area
Water Intake Installation
MARINE LAYDOWN AREA
Ice Airstrip Construction and Operation
Mobilize Fuel, Equipment, and Supplies (Air)
Upgrade Temporary Exploration Camp
Operate MLA Quarry
Construct All-weather Service Roads, Laydown Areas, and Fuel Storage Area
Mobilize Additional Fuel, Equipment, and Supplies (Vessels)
Install One Steel Bulk Fuel Tank
Water Intake/Discharge Installation

3. Applicable Legislation and Guidelines

The RMP has been prepared to comply with existing regulations and follow the available guidelines provided by the federal government and the government of Nunavut. The applicable regulations are provided in Appendix A.

Water use and waste disposal in Nunavut is regulated by the NWB through the water licensing process.

In addition, the following guidance documents have been used to inform the design and management decisions presented in the Plan:

- Northern Land Use Guidelines Access: Roads and Trails (INAC 2010);
- Geometric Guidelines (Roads and Transportation 1986);
- Protocol for Winter Water Withdrawal from Ice-Covered Waterbodies in the Northwest Territories and Nunavut (DFO 2010);
- Environmental Guidelines for the Construction, Maintenance and Closure of Winter Roads in the Northwest Territories (GNWT DoT 1993); and
- Guidelines for Safe Ice Construction (GNWT DoT 2015).

3.1 LAND TENURE

All-weather service roads and WIRs for development works will be located on Inuit Owned Lands administered by the Kitikmeot Inuit Association (KIA). The surface ownership of the land encompassing the roads right-of-ways was transferred to the KIA when the Nunavut Agreement came into effect. Land and environmental management in this area are governed by the provisions of the Nunavut Agreement.

Refer to Section 2.4 of the Main Application Supporting Document for clarification of land tenure status.

3.2 PERMITTING REGIME

Table 3.2-1 outlines the current licenses and permits held by Sabina as of August, 2017.

Table 3.2-1. Current Authorizations and Permits (as of August, 2017)

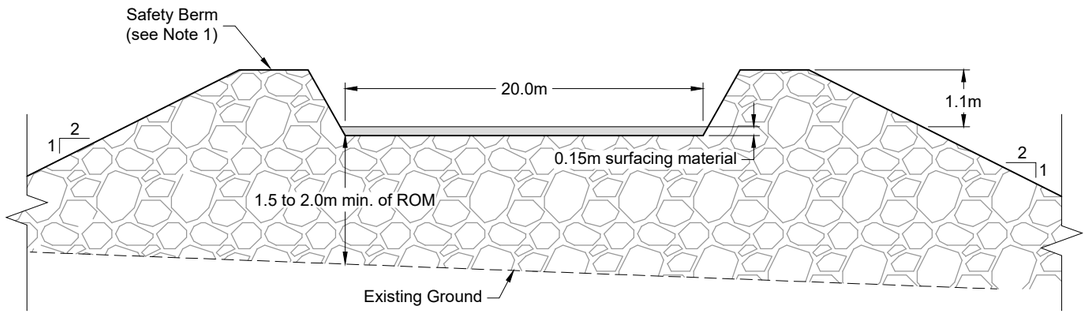
Permit	Expiry (year-mo-day)	Agency	Description
KTL204C012	2017-12-12	KIA	Boulder: Staking/prospecting, exploration (ground/air geophysics), geophysical survey, gridding and drilling.
KTL204C020	2017-12-12	KIA	Boot: Exploration (air/ground geophysics), staking, prospecting, fly/survival camp and drilling.
KTL304C017	2017-12-12	KIA	Goose: Staking/prospecting, exploration (ground/air geophysics), drilling, bulk sampling, bulk fuel storage, camp, winter road, all-weather airstrip and connecting road.
KTL304C018	2017-12-12	KIA	George: Staking/prospecting, exploration (ground/air geophysics), drilling, bulk sampling, bulk fuel storage, camp, winter road, all-weather airstrip.
KTL312C004	2017-12-12	KIA	Wishbone/Malley: Exploration (air/ground geophysics), staking, prospecting, fly/survival camp and drilling
KTL304F049	2017-12-12	KIA	Winter road connecting Bathurst Inlet - Goose and George.
KTP11Q001	2017-12-12	KIA	Goose rock quarry.
KTP12Q001	2017-12-12	KIA	Goose Airstrip borrow area.
KTP12Q002	2017-12-12	KIA	George borrow quarry.
N2011F0029	2018-12-13	INAC	Winter Road connecting George-Goose.
N2017F0016	2022-07-20	INAC	Winter Road connecting Bathurst Inlet - Back River Project.
N2012C0003	2019-02-06	INAC	Wishbone-Malley Mineral Exploration activities on Crown Land
N2016C0011	2021-10-26	INAC	Back River Exploration activities.
2BE-GOO1520	2020-02-18	NWB	Goose water licence.
2BE-GEO1520	2020-05-29	NWB	George water licence.
2BE-MLL1722	2022-06-29	NWB	Wishbone-Malley water licence.

4. Planning and Implementation

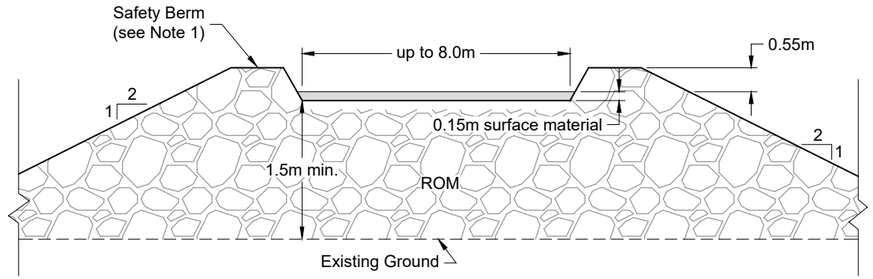
4.1 ALL-WEATHER SERVICE ROADS

The MLA and Goose Property will require the construction of all-weather service roads to facilitate development works, as well as ongoing exploration and environmental monitoring programs. Goose Property will have 7.4 km of service roads to connect the existing Airstrip Quarry, Explosives Storage Area spur road, the new Umwelt Quarry, the Goose Plant Site pad, and the existing Goose Exploration Camp (Appendix A of the MASD, base Figure 2). The MLA will have less than 2 km of service roads which will connect the camp, laydown area pads, explosives storage and the fuel storage area with the barge landing area (Appendix A of the MASD, base Figure 3).

Preliminary typical cross-sections of all-weather service roads and watercourse crossings are shown in Figure 4.1-1. Sabina confirms they will submit to the NWB for review 30 days prior to construction, construction drawings stamped by an Engineer for any engineered facilities proposed for development works. Final as-built drawings will be provided 90 days following construction in accordance with NWB requirements.



Typical Cross Section of Haul Road



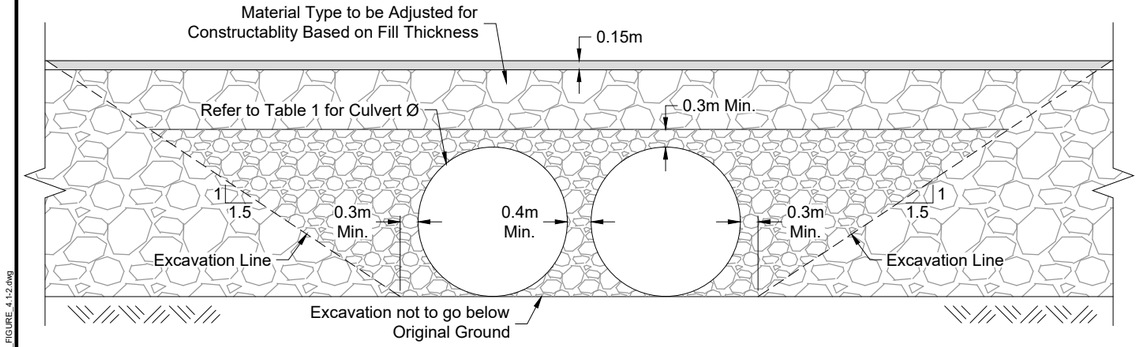
Typical Cross Section of Service Road

LEGEND

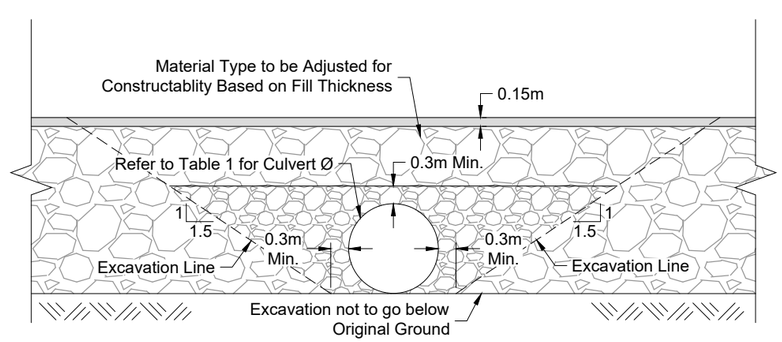
- Existing Ground Surface
- ROM (or ROQ)
- Engineered Fill
- Surfacing Material

NOTES

1. Where more than 3.0m drop-off exists at edge of road, a safety berm will be built at a height at least as high as the mid-axle height of the largest equipment piece that uses that road.
2. Not to scale.



Typical Cross Section of Double Culvert Crossing



Typical Cross Section of Single Culvert Crossing

TABLE 1: CULVERT SIZING AND LOCATION

Culvert Location	CSP Culvert Diameter Ø (m)	Number Required
Goose Culvert (C1)	2.5	2
Gander Pond Culvert (C2)	2.5	2
Goose Airstrip Culvert (C3)	2.5	2
Echo Culvert (C4)	1.2	1
Goose Creek Culvert (C5)	2.5	1

REFERENCE DRAWINGS		REVISIONS									
DRAWING NO.	DRAWING TITLE	NO.	DESCRIPTION	CHK'D	APP'D	DATE	NO.	DESCRIPTION	CHK'D	APP'D	DATE
-	-	-	-				A	ISSUED FOR PERMIT	CP	JE	17/07/29

Sabina GOLD & SILVER CORP.

DESIGN: CP	DRAWN: MZS	REVIEWED: EMR	
CHECKED: CP	APPROVED: JE	DATE: 2017/07/29	
FILE NAME: Type B 1CS020.011_RMP_FIGURE_4.1-1.pdf			SRK JOB NO.: 1CS020.01, Task 500

BACK RIVER PROJECT

ROAD MANAGEMENT PLAN

All-Weather Road and Watercourse Crossing Typical Cross Sections

REVISION NO.	SHEET	FIGURE NO.
A	1 OF 1	4.1-1

\\VAN-SVR01\Projects\01_SITES\Back River\1CS020.011_Type_A_Water_Licence\1040_AutoCAD\2016_Drawings\1CS020.011_RMP_FIGURE_4.1-2.dwg

4.1.1 Design Criteria for All-weather Service Roads

The following design criteria will be used for the development works service roads:

- Minimum width of travelling surface: up to 4.5 m for single-lane or 8 m for double-lane;
- Design speed: 50 km/h;
- Side slopes: 2H:1V;
- Maximum grade: 10%;
- Safety berms for fills greater than 3 m in height: 0.55 m; and
- Drainage: major culverts to be designed to a 1-in-100-year event.

4.1.2 Construction of All-weather Service Roads

All-weather service roads will be constructed with run of mine or run of quarry (ROQ) rock placed directly onto the tundra to preserve the permafrost. A layer of graded surfacing material will be placed to provide a protective trafficking layer. Construction materials will consist of geochemically and geotechnically suitable rock sourced from the existing Airstrip Quarry and/or the new Umwelt Quarry.

4.1.2.1 Geotechnical Recommendations

Ground conditions for design and engineering have been informed by four geotechnical investigations from 2010 to 2015 including test pits, drill holes, thermistor installations, and a variety of laboratory and in-situ testing. Geotechnical design is also supported by ERM Rescan's 2014 Cumulative Permafrost Baseline Data Report, which includes observations on active layer freeze-thaw cycle and active layer depth from 2007 to 2014. Refer to the Site-Wide Geotechnical Properties Report (FEIS Volume 2, Appendix V2-7C) for more detail.

The following road preparation recommendations specific to all-weather service roads were prepared by SRK as a result of geotechnical investigations and thermal modelling:

- 1.0 m compacted ROQ rock-fill pad (or geochemically suitable waste rock) on top of undisturbed grade for service roads;
  - maximum rock size limited to 0.9 m.
- Rock shatter required where roads cross over rock highs that impact road grade; and
- 150 mm of 2" minus topping directly on top of rock-fill pad for trafficability (no need for intermediate 6" minus layer).

4.1.3 Water Crossings

There are three culvert crossing locations planned for development works, all of which are situated on the Goose Property (Appendix A of the MASD, base Figure 2).

Two types of culverts are considered for the all-weather service roads:

- non-fish-bearing crossings; and
- fish-bearing crossings.

The non-fish-bearing crossings will consist of corrugated steel pipe and are currently designed with a diameter of either 1.2 m or 2.5 m, depending on the required flow. The fish-bearing crossings will be sized to keep maximum water velocities below 1.5 m/s such that they do not present a velocity barrier to migrating fish, more specifically Arctic Grayling. In addition, fish-bearing culverts will be embedded to a depth of 0.4 m and filled with streambed material to promote fish passage and habitat suitability. Culverts will be designed to, and conform with, Fisheries and Oceans Canada (DFO) Measures to Avoid Causing Harm to Fish and Fish Habitat (DFO 2013).

4.1.4 Water Use for All-weather Service Roads

Under the development works water licence Sabina has requested a total volume of 297 m^3 per day for WIR construction, maintenance, and dust suppression for all-weather service roads.

4.1.5 Measures to Protect Fish and Fish Habitat

Sabina is committed to ensure that serious harm to fish is avoided where possible in compliance with the *Fisheries Act* when undertaking construction or operating near water. The presence of fish in potentially affected habitats was confirmed through the multi-year baseline fish sampling programs performed for the Environmental Assessment of the Project. For example, baseline sampling suggests that most waterbodies and watercourses have the potential to support small-bodied fish species, such as Ninespine Stickleback, for at least part of the open water season; whereas only deeper waterbodies have the potential to support large-bodied species, such as Lake Trout during the winter (assuming water depths exceed the maximum ice thickness). Watershed position is also a consideration in the classification of fish-bearing status and distribution of species. Streams and ponds, including ephemeral streams and ponds, that connect two fish-bearing waterbodies with confirmed fish presence have a high likelihood of supporting fish for at least part of the open water season (e.g., spring freshet). Refer to Tables 6.3-1 and 6.3-2 of the Conceptual Fish Offsetting Plan of the Back River Project FEIS for a list of all waterbodies and watercourses with total or partial habitat losses that were either confirmed to support fish or identified as being highly likely to support fish.

Where possible, Sabina is committed to deploy all applicable recommended measures as per DFO's Measures to Avoid Causing Harm to Fish and Fish Habitat (DFO 2013), including those related to Project planning, erosion and sediment control, shoreline re-vegetation and stabilization, fish protection, and the operation of machinery. The below information re-iterates what is provided within the assessment of watercourse crossings and water intake/discharge pipes (re. WIR construction and maintenance) in the FEIS (FEIS Volumes 6 and 10).

<u>Watercourse Crossings</u>

For the fish bearing crossing at Gander Outflow, effects related to the installation of the culvert were assessed in the Project FEIS (FEIS Volume 10, Chapter 21, Section 6.3.3). Within the implementation of DFO's recommended measures, the fish-bearing crossing will continue to serve as a migration corridor, between Goose and Rascal lakes. For example, the culvert will be sized to keep maximum water velocities below 1.5 m/s such that it does not present a velocity barrier to migrating fish (Arctic Grayling). In addition, the culvert will be embedded to a depth of 0.4 m and filled with streambed material to promote fish passage and habitat suitability. Timing of in-water construction activities will conform, when possible, to Nunavut timing windows for the protection of fish and their habitat.

It is important to re-iterate that the construction and maintenance of all stream crossings and roads will follow DFO's Measures to Avoid Causing Harm to Fish and Fish Habitat. These include the following mitigation measures to guide these processes and to ensure that fish and aquatic habitat is not adversely affected by development (FEIS Volume 6, Chapter 7, Section 7.5.3):

- Design and plan in-water activities and works such that loss or disturbance to aquatic habitat is minimized and sensitive spawning habitats are avoided.
- Where possible, approaches will be designed to be perpendicular to the watercourse to minimize loss or disturbance to riparian vegetation.
- Instream activities will be undertaken in isolation of open or flowing water, or when frozen, to maintain the natural flow of water downstream and avoid introducing sediment into the watercourse.
- Effective erosion and sediment control measures will be installed before starting work to prevent sediment from entering the waterbody.
- Site isolation measures (e.g., silt boom or silt curtain) will be used to contain suspended sediment where in-water work is required.
- Regular inspection and maintenance of erosion and sediment control measures and structures will be conducted during the course of construction.
- Repairs to erosion and sediment control measures and structures will be promptly completed if damage occurs.
- Removal of non-biodegradable erosion and sediment control materials will be completed once site is stabilized.
- Clearing of riparian vegetation will be kept to a minimum to avoid disturbance to the riparian vegetation and prevent soil compaction.
- If replacement rock reinforcement/armouring is required to stabilize eroding or exposed areas, appropriately-sized, clean rock will be installed at a similar slope to maintain a uniform bank/shoreline and natural stream/shoreline alignment.
- All construction equipment and supplies will be removed from the construction-site upon Project completion.
- Machinery will be in a clean condition and maintained free of fluid leaks, invasive species, and noxious weeds.
- Whenever possible, machinery will be operated on land above the high-water mark or on ice in a manner that minimizes disturbance to the banks and bed of the waterbody.
- Whenever possible, machine fording of a watercourse will be limited to a one-time event (i.e., over and back), and only if no alternative crossing method is available. If repeated crossings of the watercourse are required, a temporary crossing structure will be constructed.
- Service machinery will be washed, refuelled, and fuel and other materials for the machinery stored, in such a way to prevent any deleterious substances from entering the water.
- Screens will be used on all water intake hoses and pumps to prevent fish entrapment.

Disposal of excavated material will be in a location 31 m above the high water mark to ensure that this material does not enter the watercourse. Efforts will be made to minimize the duration of any in-stream works and minimize disturbance at stream crossings. This practice will prevent the release of sediment or sediment-laden water into water frequented by fish. Exposed landscape surfaces will be protected, where possible, by the installation of covering material like riprap, aggregate, or rolled erosion control products. All in-stream works for waterbodies frequented by fish will be completed in accordance with the relevant DFO Guidelines.

Sediment loading in runoff will be minimized by the application of measures to intercept Total Suspended Solids before it reaches the freshwater environment. Sediment control measures could include:

- Buffer zones to trap sediment and to reduce flow velocities;
- Installation of synthetic permeable barriers, fibre rolls, and/or silt fences as required;
- Installation of check dams, gabions, and sediment basins to reduce flow velocities and encourage sediment deposition; or
- Locating stockpiles well away from watercourses.

4.1.6 Measures to Prevent Permafrost Degradation

Roads have been designed, and will be constructed, to reduce the potential for permafrost degradation. Thermal modelling confirms that a ROQ (or geochemically suitable waste rock) service road thickness of 1.0-m is acceptable. During summer, some thaw is expected; however, once the active layer is re-established, which would likely be achieved within one or two seasons, no further settlement is expected. Where possible, development work service roads will be constructed in winter months, when soils are frozen, to prevent permafrost degradation and limit differential settlement. More detail can be found in the Site-Wide Geotechnical Properties Report (FEIS Volume 2, Appendix V2-7C).

Other mitigation and environmental design features to reduce the potential for permafrost degradation include:

- Avoiding ice-rich, poorly-drained, frost-susceptible soil conditions where possible, favouring higher, more competent, well-drained ground;
- Placing road fill directly over overburden soil limiting cuts that can lead to thaw degradation;
- Removing accumulated snow before placing fill;
- Increasing road fill thickness in areas with thaw susceptible soils where necessary; and
- Construct roads in winter months when possible over frozen ground conditions.

4.2 WINTER ICE ROADS

Winter ice roads, totaling approximately 9 km in length, will be required to connect and access the proposed quarries at the Goose Property. These WIRs will allow development works to commence in the winter season, reducing potential environmental effects by avoiding any potential overland rutting or gouging. Short land based portages may be developed to support winter ice road development, Sabina will confirm all appropriate land use permits are in place prior to construction. For additional information related to environmental baseline and effects refer to Section 5 of the Main Application Supporting Document. Efforts will be made to limit distances developed by utilizing one WIR to access multiple locations, or by utilizing other infrastructure (i.e., the permanent airstrip) to shorten distances. The WIRs would be used to temporarily connect three key areas (base Figure 2):

1. Goose Exploration Camp to Airstrip Quarry (Winter Ice Road 1): This WIR will provide continued access to the existing quarry and source material needed for development works. Construction and operation of this WIR is currently a permitted activity under water licence 2BE-GOO1520, and all planned activities will be consistent with activities undertaken in previous years. No additional water usage is currently anticipated.

2. Goose Exploration Camp to Umwelt Quarry/Goose Plant Site (Winter Ice Road 2a/2b): This WIR will provide new access to Umwelt Quarry/Goose Plant Site and source material needed for development works.
3. Goose Exploration Camp (or other WIR) to Explosives Storage (Winter Ice Road 3).

4.2.1 Winter Ice Road Construction and Use

Consistent with WIR construction under 2BE-GOO1520, all WIRs will be constructed using the Government of Northwest Territories published Northern Land Use Guidelines (GNWT 2015). For overland construction, equipment with low ground bearing pressure is initially used to travel the route to clear excess snow from the alignment if required and to build an initial cover of ice and snow on top of the tundra; this creates a frozen road base upon which heavier equipment can travel without affecting the natural ground surface. Once this frozen road base is established, equipment is used to build up the road base into a smooth-running ice surface using consecutive thin layers of snow and water as fill. Where feasible, the road base is built up to a level that is above the grade of the surrounding tundra. Constructing this elevated road base will greatly assist in subsequent maintenance by preventing loose, blowing snow from accumulating on the roadway. The Land Use Guidelines (GNWT 2015) require a minimum of 10 cm compacted ice and snow coverage on the winter road travel way to adequately protect the tundra.

Construction on ice involves three main steps. The first step is the initial measurement (profiling) of ice thickness. This profiling should be carried out using Ground Penetrating Radar ice profiling. Based on the ice thickness measured, load calculations are conducted to ensure that the ice will support the weight of the snow clearing and construction equipment. Depending on the equipment to be used, normally a minimum ice thickness of 40 to 50 cm is required to begin construction. Sufficient width also assists in preventing the travel way from being “blown in” with snow during storms and high wind events, thereby reducing repeated snow clearing efforts and operational delays for freight traffic. Once the ice has been cleared of snow along the route, the ice thickness will increase naturally at an enhanced rate due to direct exposure to cold ambient air temperatures. The rate of ice growth can also be enhanced by flooding the ice sheet. Regular ice profiling will be conducted throughout the WIR construction and operations to monitor ice growth and to maximize the safe loading capacity of the ice.

Winter ice road construction will adhere to the following guidelines based on DFO Operational Statements:

- Use existing trails or WIRs wherever possible as access routes to limit unnecessary clearing of additional vegetation and prevent soil compaction.
- Construct approaches and crossings perpendicular to the watercourse wherever possible.
- Construct ice bridge and snow fill approaches using clean, compacted snow and ice to a sufficient depth to protect the banks of the lake, river, or stream.
- Install sediment and erosion control measures before starting work to prevent the entry of sediment into the watercourse. Inspect them regularly during the course of construction and decommissioning activities and make all necessary repairs if any damage occurs.
- Operate machinery on land or on ice, and in a manner that minimizes disturbance to the banks of the lake, river, or stream.
- Ensure that the intakes are sized and adequately screened to prevent debris blockage and fish entrapment.
- Crossings do not impede water flow at any time of the year.

- When the crossing season is over, and where it is safe to do so, create a v-notch in the centre of the ice bridge to allow it to melt from the centre, and also to prevent blocking fish passage, channel erosion and flooding. Compacted snow should be removed from snow fills prior to the spring freshet.
- Stabilize any waste materials removed from the work site to prevent them from entering the lake, river, or stream. This could include covering spoil piles with biodegradable mats or tarps.
- The site should be stabilized using effective sediment and erosion control measures. In areas with permafrost, care should be exercised to ensure these measures do not cause thawing or frost heave.

4.2.2 Water Use for Winter Ice Road Construction and Maintenance

For the purpose of development works, the expected water use for the construction and maintenance of the WIRs is estimated to be up to 297 m^3/day. All water will be sourced from Goose Lake and Lakes proximal to the MLA.

Consistent with water usage under Sabina's existing 2BE-GOO1520, water withdrawal will adhere to the following guidelines from DFO's Protocol for Winter Water Withdrawal from Ice-covered Waterbodies in the Northwest Territories and Nunavut (DFO 2010):

- In one ice-covered season, total water withdrawal from a single waterbody will not exceed 10% of the available water volume calculated using the appropriate maximum expected ice thickness.
- In cases where there are multiple users withdrawing water from a single waterbody, the total combined withdrawal volume will not exceed 10% of the available water volume.

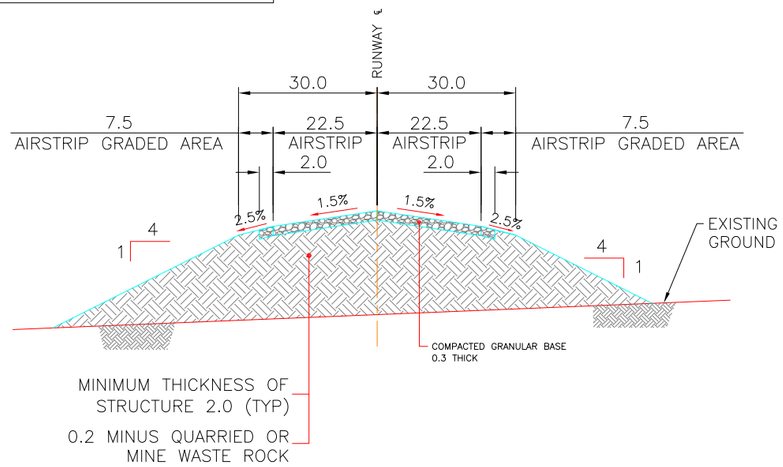
Sabina will equip all water intake hoses with a screen of an appropriate mesh size to ensure that fish are not entrained, and will withdraw water a rate such that fish do not become impinged on the screen.

4.3 ALL-WEATHER AIRSTRIP EXTENSION

The Goose Property currently has a 914-m all-weather gravel airstrip that can be used year-round, and during the winter months, January to May, a 2,000-m (6,564 ft.) ice airstrip can be established on Goose Lake. The current airstrip will be extended to allow for servicing passenger and cargo aircraft in support of ongoing year-round exploration and development works. This airstrip will serve as the main air access to the Goose Property throughout the life of the Project. The all-weather airstrip will be designed to Transport Canada standard TP 312 Aerodrome Standards and Recommended Practices (2015). The airstrip will be extended to be approximately 1,524 m long and 45 m wide. Preliminary typical cross-sections of the all-weather airstrip extension are shown in Figure 4.3-1.

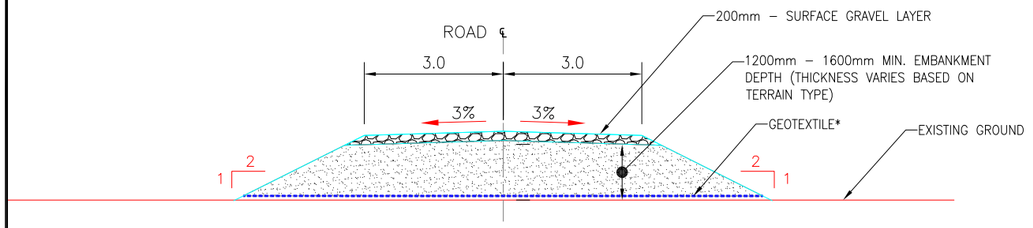
4.3.1 Construction of All-weather Airstrip

Due to the continuous permafrost and possible thaw degradation on the Goose Property, the airstrip extension, if completed, will be constructed with embankment fills of approximately 2 m thick. The fill material will be geochemically suitable quarried rock or waste rock. This will be topped by an approximately 0.3-m thick compacted granular base trafficable layer. The airstrip will be equipped with lights, communications equipment, and instrumentation in accordance with appropriate Federal regulations. Environmental considerations are incorporated into design and routing. Wind direction and speeds, in addition to existing terrain and ground conditions, determined the optimal airstrip orientation.



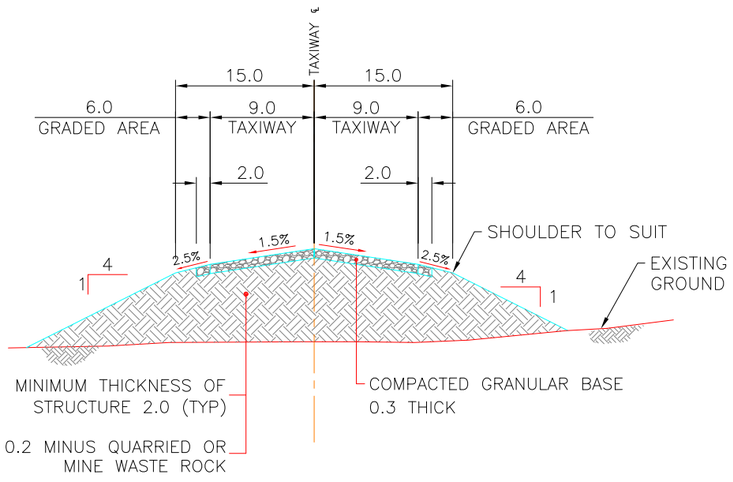
TYPICAL AIRSTRIP SECTION

NOT TO SCALE



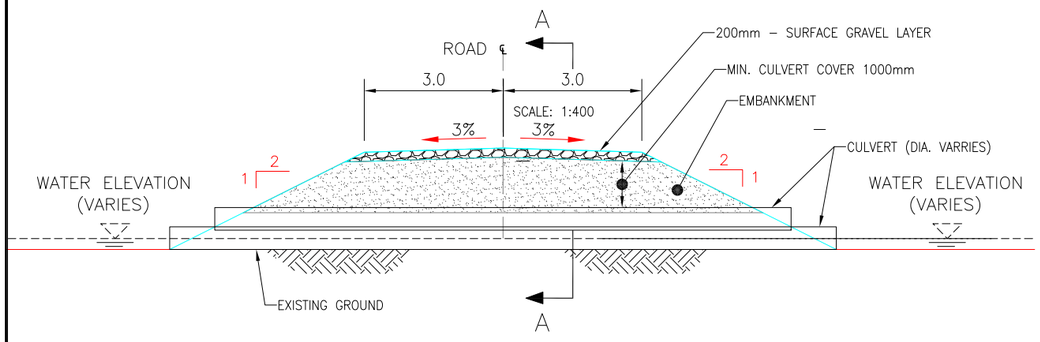
*GEOTEXTILE – MAY BE REQUIRED
DEPENDING ON SITE CONDITIONS

TYPICAL ACCESS ROAD SECTION

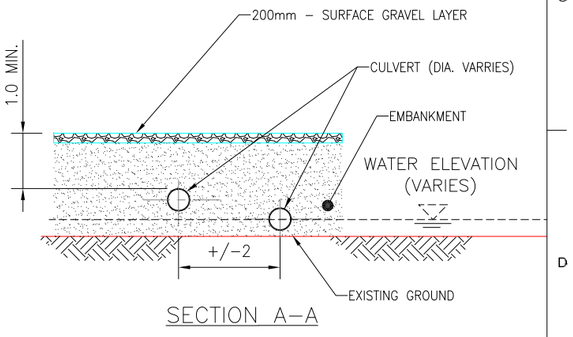


TYPICAL TAXIWAY SECTION

NOT TO SCALE



TYPICAL ACCESS ROAD CULVERT SECTION



SECTION A–A

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN METRES.

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Sabina GOLD & SILVER CORP.

DRAWING No.	DRAWING TITLE
REFERENCE DRAWINGS	

REGISTERED PROFESSIONAL

No.	DESCRIPTION	BY	CHK'D	DATE
REVISIONS				

ROLE	NAME	SIGNATURE	DATE
DRAFTSPERSON		B. Wong	
DESIGNER		T. Herd	
CHECKER			
DESIGN COORD.			
RESP. ENG.			
LEAD DISC. ENG.			
ENG. MANAGER			
PROJ. MANAGER			

DRAWING APPROVAL STATUS:

BACK RIVER FEASIBILITY STUDY

TYPICAL SECTION - AIRSTRIP,ROAD & CULVERT SECTIONS

SCALE	DWG. No.	REV
1:200 OR AS NOTED	100-20-003	

$USERNAME$

5. Roles and Responsibilities

The General Manager is ultimately responsible for the success of the Plan and approves all relevant policies and documents, auditing, action planning, and the verification process.

The Environmental Superintendent, along with his/her direct reports, is responsible for monitoring the effective implementation of this plan.

6. Inspection, Maintenance, and Monitoring of Roads

Sabina will have the Site Supervisor, or their designate, responsible for ongoing inspection and maintenance. The following is a summary of the procedures that will be applied.

6.1 ALL-WEATHER SERVICE ROADS AND AIRSTRIP INSPECTION AND MAINTENANCE

Sabina recognizes that a good inspection program will lead to the early identification of areas of the road and airstrip where improvements are necessary. The early resolution of any deficiencies will result in less ongoing maintenance and repair of the infrastructure.

The airstrip and all-weather service roads and its shoulders will be inspected regularly during the summer period for evidence of seasonal freeze and thaw adjacent to the toe of the road embankment. Such movements are expected, and may lead to longitudinal cracking and thaw settlement especially for portions of the road founded on thaw-susceptible (ice-rich) soil. When such areas are discovered, the affected area will be repaired using geochemically and geotechnically suitable granular material and/or crushed rock.

The all-weather service roads and airstrip will be inspected for signs of accumulation of ponded water, either on the surface or along the sides. Where noticed, the Site Supervisor will evaluate and monitor the accumulation to determine why water is accumulating in these areas. Based on these evaluations, the Site Supervisor will take remedial action where and when necessary to correct the cause of such ponding, such as grading of the surface to remove areas of ponding or installation of additional culverts if the road is causing excessive water ponding.

In fall, winter, and spring, maintenance will be adjusted according to the weather conditions. Snow clearing along the roads and airstrip will be completed to ensure that the roads can be operated safely. The manner in which the snow is cleared will also take into account the road configuration to ensure that snow accumulation will not cause any complications during the freshet.

Inspection frequency will be increased during the following critical time periods:

- Just prior to spring freshet to ensure that the culverts and stream crossings are in a good state to accommodate the rapid spring thaw;
- During the spring freshet to ensure that the culverts and stream crossings are not impeding spring freshet and to initiate action (including removing accumulated ice) when and where required to prevent wash outs; and
- Just after heavy rainfall events to monitor water accumulation, to ensure that culverts and diversion/collection channels and ponds are passing precipitation as planned, and to initiate action when and where required to prevent erosion and wash outs.

See Section 6.1.2 for additional details on the inspection and maintenance of water crossings.

6.1.1 Dust Management

The amount of dust generated along the service roads and airstrip is dependent on the dryness of the surface, the number of vehicles, weight and speed, and maintenance of the driving surface.

Water remains the most readily available means of controlling dust in Nunavut. It is common at mine sites worldwide to apply water through fantail sprayers or spray bars attached to a haul truck or equivalent fitted with a large tank. Sabina recognises that water is only a temporary measure, and reapplications could be necessary to achieve the desired dust control efficiency. The control efficiency of water applications is dependent on the amount of water applied, the time between re-applications, penetration depth of the water into the road surface, the traffic volume, prevailing weather conditions, and the state of the road surface (e.g., excessive fines over coarse material). All these variables need to be considered before selecting water to control dust from roads and other mine areas.

Watering the roads is only possible during frost-free days. In late spring, significant sublimation can be expected when the temperatures remain below freezing, which can lead to dry roads and significant dust potential. If water is applied while the temperature is below freezing, it will turn to ice on the road and pose a safety hazard for travel. Dust suppression using water or chemicals will not be possible under these conditions.

Sabina is requesting that the 297 m^3/day of water required to build and maintain the WIRs during winter be available for dust suppression and compaction of placed construction materials during the open water season.

6.1.2 Watercourse Crossings Inspection and Maintenance

The watercourse crossing inspection and maintenance program has these main components:

- A regular inspection program to identify issues relating to watercourse crossings such a structural integrity and hydraulic function.
- All necessary repairs and adjustments will be conducted in a timely manner.
- An event inspection program to track the impacts of large storm events on watercourse crossings, such as structural integrity and hydraulic function.
- A culvert location inspection program to ensure that culverts have been installed in the right location with respect to the watercourse, and that culvert capacity is adequate to ensure that the culvert(s) pass the water under all hydraulic conditions.

Culverts will be sized for each stream crossing to accommodate normal summer flows, as well as spring freshet and heavy rainfall flows.

Visual monitoring will be conducted on a regular basis to ensure drainage and erosion controls are effective per the following guidelines:

- Culvert maintenance will be conducted following DFO's "Measures to Avoid Causing Harm to Fish and Fish Habitat" (DFO 2013).
- Instream work will be conducted during approved timing windows presented in DFO's "Measures to Avoid Causing Harm to Fish and Fish Habitat" (DFO 2013).

Starting during the freshet period (mid-May through June), crossing inspections will be performed during the ice-free period prior to fall freeze-up which typically occurs in October of each year. These activities for each watercourse crossing will consist of visual inspection to:

- Identify defects, cracks, or any other risks to structural integrity of the infrastructure. Particular attention will be paid to the inlet and outlet structures of culverts.

- Identify sediment or other debris accumulation impeding the free flow of water through the crossings. Maintenance operations will consist of hand removal of accumulated debris and repairing damage as soon as possible.
- Identify bed erosion or scour around the watercourse crossing or the upstream and downstream channel. Any erosion concerns will be addressed as soon as possible.

Particular attention will also be paid to potential sources of sediment transport at the crossing. Inspection results will be recorded to help track changes in conditions over time. Maintenance operations will consist of undertaking remediation of any detected problems and repairing damage as soon as possible.

Routine spring snow management will include the safe removal of any snow and ice that accumulates at both end of the culverts so that water at freshet can move freely through the culverts and waterway. Proper technique will be used to ensure that no ground disturbance if limited during snow and ice removal. Culverts and stream crossings will be inspected just prior to and during the spring freshet to ensure that the culverts and stream crossings are sufficiently clear to accommodate the rapid spring thaw and that action will be initiated (including removing accumulated ice) where required. Prior to Freshet, water crossings will have snow removed from ice surface on the up and downstream side of the crossing to allow free flow of water. Where culvert ice blockage is identified during inspection and if watercourse crossings can't accommodate the spring freshet, culvert thawing (steaming) will be considered as a maintenance measure.

6.2 WINTER ICE ROADS INSPECTION AND MAINTENANCE

During WIR operations, the roads will be inspected and maintained in accordance with the "*Guidelines for Safe Ice Construction*" (GNWT DoT 2015). These regulations state that ice thickness testing inspections should be done once a week on snow roads, twice a week on WIRs, and daily on ice bridges. Test hole spacing and frequency as recommended in the field guide are presented below for each WIR construction phase in Table 6.2-1.

Table 6.2-1. Field Guide for Ice Construction Safety Recommended Ice Testing

	Preconstruction	**Construction**	**Operation and Maintenance**
	Initial test run	From start of construction until road is opened to traffic	This may overlap with construction activities at lower load levels
Rivers	If GPR is used, test holes are only required for calibration and for mapping of thin areas 30 m between test holes along centre line	If GPR is used, test holes are only required for calibration and for mapping of thin areas 30 m between test holes along alternate edges	If GPR is used, test holes are only required for calibration and for mapping of thin areas 30 m between test holes along alternate edges Look for thin areas caused by river current

Lakes	If GPR is used, test holes are only required for calibration If within 250 m of shore: 30 m between test holes along centre line If more than 250 m from shore: 250 m between test holes along centre line	If GPR is used, test holes are only required for calibration If within 250 m of shore: 30 m between test holes along alternate edges If more than 250 m from shore: 250 m between test holes along alternate edges	If GPR is used, test holes are only required for calibration and for mapping of thin areas 250 m between test holes along alternate edges
Mackenzie Delta	If GPR is used, test holes are only required for calibration 250 m between test holes along centre line	If GPR is used, test holes are only required for calibration 250 m between test holes along alternate edges	If GPR is used, test holes are only required for calibration and for mapping of thin areas

Source: Northwest Territories Department of Transportation. "Guidelines for Safe Ice Construction" 2015.

6.3 SNOW CLEARING

The Project is expected to experience snow drifts due to strong winds and snow accumulation over the winter season. Roads will be cleared of snow drifts as needed to ensure a safe running surface is maintained. Snow banks will be maintained at a height low enough to ensure the safe passage of terrestrial mammals.

6.4 INCIDENT RESPONSE

Despite the preventative and mitigation measures taken, should any incident arise as a result of human error or unforeseen circumstances, the response procedures outlined in the Comprehensive Spill Contingency Plan and Sabina's Emergency Response Plan will be implemented. The types of accidents and malfunctions that may occur are as follows:

- Vehicle collisions that may result in personal injury and spillage of potential harmful materials such as fuel, lubricating fluids, or antifreeze.
- Contact between vehicles and wildlife that may result in harm to wildlife, personal injury, and spillage of potentially harmful materials.
- Single vehicle accidents that may result in personal injury and spillage of potentially harmful materials.
- Risk of people getting stranded on the roads in bad weather, such as in blizzard, white out or dense fog conditions, or due to mechanical breakdown.
- Risk of accident due to an intoxicated or impaired driver on the roads.
- Spills of harmful materials onto the land or into water through a vehicle rollover or tipping during bad weather.

Sabina will report all reportable-scale incidents to the appropriate authority; this may include the KIA, Mines Inspector, RCMP, NWB, Nunavut Spill Line, Environment and Climate Change Canada, Government of Nunavut Department of Environment, and DFO.

The following actions are to be taken in the event of an accident on the roads involving other vehicles (including all-terrain vehicles), or in the event of an accident involving contact with wildlife, such as caribou, muskox, bear, wolf, etc.:

- Check the condition of people involved in the accident and provide immediate first aid if appropriate.
- Call the Sabina road dispatch by radio and report the location and nature of the accident and indicate the type of assistance required (e.g., medical help, environmental cleanup, fire, and/or mechanical help).
- Secure the accident site so that any vehicles do not continue to present a hazard to others. This may involve moving the vehicles to the nearest pull off in the event of a minor accident, or blocking off the road in both directions in the event of a more serious accident.
- If safe to do so, secure the site to prevent continued spill or leakage of contaminants into the surrounding environment.

Upon receiving the accident call, logistics will initiate the emergency response procedure passing along the information to the Operations Manager. The Operations Manager will then call out the required emergency response personnel to assist at the accident site.

In the event of an incident involving contact with wildlife, the road dispatch will notify the Operations Manager and the environmental representatives. The Environmental Department will ensure that appropriate reporting of such incidents is made on a timely basis to the KIA, relevant Hunters and Trappers Organization(s), and the Government of Nunavut Wildlife Officers.

7. Wildlife Protection Measures

Wildlife may occasionally be observed near the all-weather service roads. This section describes the measures to ensure that wildlife are protected, including:

- Roles and responsibilities;
- Mitigation measures that will apply at all times;
- Management measures should wildlife be observed near all-weather roads, the WIR, and the airstrip; and
- Management of wildlife incidents.

Measures to protect fish and fish habitat are described in Section 4.1.5.

More information on the protection of wildlife is available in the Wildlife Mitigation and Monitoring Program Plan (Version 7, submitted with FEIS Addendum February 2017).

7.1 ROLES AND RESPONSIBILITIES

The protection measures described in this section apply to all Project personnel, contractors, and visitors to site who use Project roads or the airstrip. In cases of operational challenges (e.g., groups of caribou), the Environmental Manager and environmental personnel on-site will manage the situation. The Project personnel will be notified by radio if any wildlife is observed on the road according to current communication procedures.

7.2 MITIGATION DURING ROAD CONSTRUCTION

- The all-weather service roads will be constructed to avoid active wildlife residences, such as dens or active bird nests. More information is available in the Wildlife Mitigation and Monitoring Program Plan (Version 7, submitted with FEIS Addendum February 2017).
- The WIR will be constructed each winter such that it is not a barrier to movement for caribou; the height of snowbanks will be limited to approximately 1 m and snow plowing will be conducted in such a way as to limit the angle and vertical height of the snowbank edge.

7.3 MITIGATION MEASURES FOR ALL ROADS

The following protocol will be implemented on the road and airstrip for the protection of wildlife:

- Traffic on all roads will be managed and monitored through a central dispatch.
- Observations of caribou and other large mammals will be reported to the Environmental Department.
- Roads will be closed to the public and to all foot traffic. Road use will be restricted only to persons required for Project activities.
- Vehicle speeds on the all-weather and WIR will be limited to 60 km/hr.
- It will be strictly forbidden for any individual to feed wildlife, litter, or harvest wildlife while on-site.

- Appropriate mitigation strategies (e.g., signage) will be developed for areas with higher frequency of encounters with wildlife.

7.4 MANAGEMENT FOR THE ALL-WEATHER ROADS

- If a driver observes a caribou, 10 muskox, or other large mammal (e.g., grizzly bear, wolves, or wolverine) within 500 m of any road, the driver will slow to 40 km/hr, alert other drivers, and proceed with caution.
- If a driver on an all-weather road observes that caribou (or muskox, grizzly bear, wolves or wolverine) are on the road or within 50 m of the road and moving towards the road with the intention to cross the road, then the vehicle will stop, the driver will alert the Environment Department, and will proceed when the animals have crossed the road and moved off, or may then proceed slowly after a wait of 20 minutes.
- If a driver on the all-weather road observes caribou on the road, they will stop the vehicle until the caribou move off. If other wildlife are standing on the road, then the driver will stop for up to 20 minutes, then proceed slowly to encourage the wildlife to move off the road.

7.5 MANAGEMENT FOR THE WINTER ICE ROAD

- If a driver observes a caribou (or other large mammal) within 500 m of any road, the driver will slow to 40 km/hr, alert other drivers, and proceed with caution.
- If a driver observes that caribou (or other large mammal) are within 50 m of the road and moving towards the road with the intention to cross it, then the vehicle will stop, the driver will alert the Environment Department, and will proceed when the animals have crossed the road and moved off; alternatively, after 20 minutes the driver may proceed slowly if animals have not made their road crossing.
- If caribou are resting on the road, then the driver will wait until the animals have moved off on their own.

7.6 MANAGEMENT OF WILDLIFE INCIDENTS

- All incidents between vehicles and wildlife must be reported to the Environmental Department whether they are:
  - near miss incidents;
  - collision with injury to the wildlife; or
  - wildlife mortality.
- Each incident will be investigated by the Site Supervisor and environment personnel with measures taken to avoid reoccurrence. Disciplinary measures will be taken against any employee if the investigation concludes that the accident is the result of negligence.
- In the case of the accidental death of an animal, environment personnel will contact the Government of Nunavut Wildlife Officer, KIA Senior Lands Manager, and the Hunters and Trappers Organization office in Kugluktuk and Cambridge Bay to discuss what to do with the carcass. The default action will be to remove the carcass from the road and incinerate it to avoid attracting scavengers, such as wolves, grizzly bear, Arctic fox, and/or wolverine.

More information on wildlife protection measures can be found in the Wildlife Mitigation and Monitoring Program Plan (Version 7; submitted with FEIS Addendum February 2017).

Wildlife monitoring will be incorporated into current wildlife tracking according to the terms and conditions of current land use permits. This includes a log of sightings that detail wildlife observed, estimate of numbers, and nearest kilometre marking along the all-weather road or WIR. The data will be aggregated and reported in the annual Wildlife Effects Monitoring Program Report. Additional details can be found in the Wildlife Mitigation and Monitoring Program Plan (Version 7; submitted with FEIS Addendum February 2017).

7.7 MANAGEMENT FOR THE AIRSTRIP

- Prior to aircraft landing on the airstrip, a visual inspection will be conducted to identify the presence of any wildlife on the airstrip. Small groups of wildlife will be escorted off the airstrip; the flight crew will be notified by radio that such action is taking place and aircraft will not be approved to land until the airstrip is clear.
- If groups of greater than 25 caribou are observed on the airstrip then no action will be taken. If the wildlife cannot be escorted from the airstrip within a reasonable length of time, the flight crew will be instructed to divert to another location.

8. Adaptive Management

The Plan will be reviewed, and if necessary, updated again prior to submission of the Type A Water Licence application. The Plan will be reviewed on a regular basis to incorporate any lessons learned, major changes to facility Operations or maintenance, and environmental monitoring results.

All employees will be informed of relevant updates and the updated RMP will be located in a designated area at each site.

Sabina will retain all raw data records and annual reporting for at least two years in digital format. The updated RMP, raw data, and annual reporting will be made available by Sabina at all times for review by the lands and waters inspectors, the NWB, and Environment and Climate Change Canada.

This plan represents an adaptive approach to understanding the effects of the Project on the landscape and the species that live there. In this context, the Plan is part of a continually evolving process that relies not only on the efficacy of data collection and analytical results, but is also dependent on feedback from the communities, government, Aboriginal groups, and the public. Having an adaptive and flexible program allows for appropriate and necessary changes to the design of monitoring studies, and the mitigation and monitoring plans. Some changes may come about through the observation of unanticipated effects or inadequacies in the sampling methods to detect measurable effects. Other changes may result from ecological knowledge acquired through working with Aboriginal community members and discussions with Elders, both in the field and through workshops.

Sabina is committed to considering and incorporating Traditional Knowledge into the Plan. The incorporation of Traditional Knowledge will occur throughout all stages of the Plan, including identification of mitigation measures, monitoring study design, data collection, and follow-up programs to obtain feedback.

9. Reclamation and Closure

Decommissioning of the roads will involve restoring natural drainage, which will be accomplished by removing all culverts, and other potential obstructions to drainage paths. Any slopes where there is potential for erosion will be stabilized. Stabilization measures may require pulling back of side-cast fills on locally steep slopes or buttressing and/or re-contouring of steepened slopes using non acid generating material. Refer to the Interim Closure and Reclamation Plan for additional details on the closure of roads.

10. References

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DFO. 2013. Measures to Avoid Causing Harm to Fish and Fish Habitat. http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html

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GNWT DoT. 2015. Guidelines for Safe Ice Construction. February 2015.

INAC (Indigenous and Northern Affairs Canada). 2010. Northern Land Use Guidelines – Access: Road and Trails.

NIRB (Nunavut Impact Review Board). 2013. *Guidelines for the Preparation of an Environmental Impact Statement for Sabina Gold & Silver Corp.'s Back River Project*. NIRB File No. 12MN036).

NWB (Nunavut Water Board). 2010a. Mining and Milling Supplemental Information Guideline (SIG) for Mine Development (MM3). February 2010.

NWB. 2010b. Miscellaneous Supplemental Information Guideline (SIG) for General Water Works (including crossings, flood control, diversions, and flow alterations) (M1). February 2010.

Roads and Transportation Association Canada. 1986. Manual of Geometric Design Standards for Canadian Roads.

Transport Canada. 2015. Aerodromes Standards and Recommended Practices (TP 312) 5th Edition. Revised July 2015.

Appendix A. Applicable Legislation

Acts	Regulations	Guidelines
Federal		
Canadian Environmental Protection Act (1999 c.33)	Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (SOR/2008-197) Environmental Emergency Regulations (SOR/2003-307) Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149) Interprovincial Movement of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2002-301) Federal Registration of Storage Tank Systems for Petroleum Products and Allied Petroleum Products on Federal Lands or Aboriginal Lands Regulations (SOR/97-10) Fuels Information Regulations, No. 1 (SOR/C.R.C., c. 407) Sulphur in Diesel Fuel Regulations (SOR/2002-254) Sulphur in Gasoline Regulations (SOR/99-236)	Canadian Council of the Ministers of Environment - Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products Notice with respect to substances in the National Pollutant Release Inventory Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil
Canada Water Act (1985 c.11)		
Canada Wildlife Act (1985 w9)	Wildlife Area Regulations (C.R.C., c. 1609)	
Species at Risk Act (2002 c.29)		(Eskimo Curlew – endangered)
Migratory Birds Convention Act (1994 c.22)	Migratory Birds Regulations (C.R.C., c. 1035) Migratory Bird Sanctuary Regulations, [C.R.C., c.1036]	Avoidance Guidelines: • Reducing Risk to Migratory Birds • Technical Information • Guidelines to Avoid Disturbance to Seabird and Waterbird Colonies in Canada • Birds at Sea • General Nesting Periods of Migratory Birds in Canada

Acts	Regulations	Guidelines
Fisheries Act (1985, c. F-14)	Metal Mining Effluent Regulations (SOR/2002-2222) Applications for Authorization Under Paragraph 35(2)(B) of the Fisheries Act Regulations Aquatic Invasive Species Regulations (SOR/2015-121) Regulations Establishing Conditions for Making Regulations Under Subsection 36(5.2) of the Fisheries Act (SOR/2014-91)	Fisheries Protection Policy Statement Framework for Assessing the Ecological Flow Requirements to Support Fisheries in Canada DFO Protocol for Winter Water Withdrawal from Ice-covered Waterbodies in the Northwest Territories and Nunavut Implementing the New Fisheries Protection Provisions under the *Fisheries Act* - Discussion Paper General Fish-out Protocol for Lakes and Impoundments in the Northwest Territories and Nunavut Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters Freshwater Intake End-of-Pipe Fish Screen Guideline Standard Operating Procedure – Clear Span Bridges
Explosives Act (1985 c.E-17)	Ammonium Nitrate and Fuel Oil Order (C.R.C., c. 598) Explosives Regulations (C.R.C., c. 599)	
Navigation Protection Act (R.S. 1985 c. N-22, s. 1; 2012, c.31, . 316)	Navigable Waters Bridges Regulations (C.R.C., c. 1231) Navigable Waters Works Regulations (C.R.C., c. 1232)	List of Scheduled Waters (Schedule in the Act)
Transport of Dangerous Goods Act (1992, c. 34)	Transportation of Dangerous Goods Regulations (SOR/2001-286)	
Territorial Lands Act (R.S. *1985, c. T-7)*	Northwest Territories and Nunavut Mining Regulations (C.R.C., c. 1516) Territorial Lands Regulations (CRC, c 1525) Territorial Land Use Regulations (CRC, c 1524) Territorial Quarrying Operations, [C.R.C., c. 1527] Northwest Territories Mining District and Nunavut Mining District Order	Northern Land Use Guidelines: Administrative Process
Nunavut Waters and Nunavut Surface Rights Tribunal Act (2002, c.10)	Nunavut Waters Regulations (SOR/2013-69)	
Nunavut Act (1993 c.28)	Nunavut Archaeological and Paleontological Sites Regulations (SOR/2001-220)	
Nunavut Land Claims Agreement Act (1993, c.29)		

Acts	Regulations	Guidelines
Territorial		
Environmental Protection Act (RSNWT (nu) 1988, c E-7)	*Spill Contingency Planning and Reporting Regulations* (NWT Reg (Nu) 068-93) The removal of hazardous materials will require the registration with the Government of Nunavut, Department of Environment as a waste generator as well as carrier (if applicable) prior to transport. Asphalt Paving Industry Emission Regulations, R.R.N.W.T. 1990 c. E-23	Guideline on Dust Suppression Guideline for the General Management of Hazardous Waste in Nunavut Guideline for Industrial Waste Discharges in Nunavut Guideline for Air Quality – Sulphur Dioxide and Suspended Particulates Guideline for the Management of Waste Antifreeze Guideline for the Management of Waste Batteries Guideline for the Management of Waste Paint Guideline for the Management of Waste Solvents Guideline for Industrial Projects on Commissioner's land Canada-Wide Standards for Particulate Matter (PM) and Ozone Canada-Wide Standards for Petroleum Hydrocarbons (PHC) In Soil
Historical Resources Act RSNWT (Nu) 1988, c. H-3)		
Wildlife Act (RSNWT (Nu) 1988, c W-4)	*Wildlife General Regulations* (NWT Reg (Nu) 026-92) *Wildlife Licences And Permits Regulations* (NWT Reg (Nu) 027-92) *Wildlife Management Barren-Ground Caribou Areas Regulations* (NWT Reg (Nu) 099-98) *Wildlife Management Grizzly Bear Areas Regulations* (NWT Reg (Nu) 155-96) *Wildlife Management Zones Regulations* (RRNWT (Nu) 1990 c W-17) *Wildlife Regions Regulations* (NWT Reg (Nu) 108-98) Critical Wildlife Areas Regulations, R.R.N.W.T. 1990 c. W-3 Polar Bear Defence Kill Regulations, N.W.T. Reg. 037-93 Wildlife Management Muskox Areas Regulations, R.R.N.W.T. 1990 c. W-11 Wildlife Management Polar Bear Areas Regulations, R.R.N.W.T. 1990 c. W-13 Wildlife Sanctuaries Regulations, R.R.N.W.T. 1990 c. W-20 Wildlife Preserves Regulations, R.R.N.W.T. 1990 c. W-18	

Acts	Regulations	Guidelines
Territorial Parks Act (RSNWT (Nu) 1988, c T-4)	*Territorial Parks Regulations* (RRNWT (Nu) 1990 c T-13)	
Scientists Act (RSNWT (Nu) 1988 c S-4)	*Scientists Act Administration Regulations* (NWT Reg (Nu) 174-96)	
Commissioner's Land Act (RSNWT 1988, c C-11)	*Commissioner's Airport Lands Regulations* (NWT Reg (Nu) 067-97) *Commissioner's Land Regulations* (RRNWT 1990, c C-13)	
Mine Health And Safety Act (SNWT (Nu) 1994, c 25)	*Mine Health And Safety Regulations* (NWT Reg (Nu) 125-95) Mine Health and Safety Regulations, amendment, Nu. Reg. 016-2003	
Workers' Compensation Act (RSNWT, 1988, c. W-6)	*Workers' Compensation General Regulations* (Nu Reg 017-2010)	
All-Terrain Vehicles Act (RSNWT (Nu) 1988, c A-3)	*All-Terrain Vehicles Regulations* (RRNWT (Nu) 1990 c A-1)	
Apprenticeship, Trade And Occupations Certification Act (RSNWT (Nu) 1988, c A-4)	Apprenticeship, Trade And Occupations Certification Regulations (RRNWT (Nu) 1990 c A-8) Occupation Designation Order, N.W.T. Reg. 026-96 Trade Advisory Committees Order, R.R.N.W.T. 1990 c. A-9 Trade Designation Order, R.R.N.W.T. 1990 c. A-10	
Electrical Protection Act (RSNWT (Nu) 1988, c E-3)	*Electrical Protection Regulations* (RRNWT 1990 c. E-21)	
Explosives Use Act (RSNWT (Nu) 1988, c E-10)	*Explosives Regulations* (RRNWT (Nu) 1990 c E-27)	
Fire Prevention Act (RSNWT (Nu) 1988, c F-6)	Fire Prevention Regulations (RRNWT (Nu) 1990 c F-12) Propane Cylinder Storage Regulations, N.W.T. Reg. 094-91	
Hospital Insurance And Health And Social Services Administration Act (RSNWT 1988, c T-3)	Territorial Hospital Insurance Services Regulations (RRNWT (Nu) 1990 c T-12) Baffin Regional Health and Social Services Board Order, N.W.T. Reg. 059-98 Hospital Standards Regulations, R.R.N.W.T. 1990 c. T-6	
Labour Standards Act (RSNWT (Nu) 1988, c L-1)	*Various*	
Motor Vehicles Act (RSNWT (Nu) 1988, c M-16)	*Large Vehicle Control Regulations* (RRNWT (Nu) 1990 c M-30) *Motor Vehicle Registration And Licence Plate Regulations* (RWT Reg (Nu) 054-94)	

Acts	Regulations	Guidelines
Petroleum Products Tax Act (RSNWT (Nu) 1988, c P-5)	*Petroleum Products Tax Regulations* (RRNWT (Nu) 1990 c P-3)	
Public Health Act (RSNWT (Nu) 1988, c P-12)	*Camp Sanitation Regulations* (RRNWT (Nu) 1990 c P-12) *General Sanitation Regulations* (RRNWT (Nu) 1990 c P-16) *Public Water Supply Regulations, R.R.N.W.T. 1990 c. P-23* *Public Sewerage Systems Regulations, R.R.N.W.T. 1990 c. P-22*	
Public Highways Act (RSNWT (Nu) 1988, c P-13)	*Highway Designation And Classification Regulations* NWT Reg (Nu) 047-92)	
Safety Act (RSNWT 1988, c.S-1)	*General Safety Regulations, Amendment NU Reg 021-2000* (RRNWT (Nu) 1990 c S-1) Asbestos Safety Regulations, N.W.T. Reg. 016-92 General Safety Regulations, R.R.N.W.T. 1990 c. S-1 Safety Forms Regulations, N.W.T. Reg. 102-91 Silica Sandblasting Safety Regulations, N.W.T. Reg. 015-92 Work Site Hazardous Materials Information System Regulations, R.R.N.W.T. 1990 c. S-2	
Transportation Of Dangerous Goods Act (1990. RSNWT (Nu) 1988, c 81 (Supp))	*Transportation Of Dangerous Goods Regulations* (1991, NWT Reg (Nu) 095-91)	Emergency Response Assistance Plans (ERAPs)

Applicable Legislation and Guidelines for the Back River Project

Appendix E Spill Contingency Plan Back River Project Engagement Record



Comprehensive Spill Contingency Plan

June 2018

EXECUTIVE SUMMARY

Spill Contingency Plan

This Plan describes the spill response procedures to be used by Sabina at the Back River Project. This Plan outlines the procedures to be followed to ensure that 1) human life is protected and the potential for injury during spill response activities is minimized to the extent possible, 2) all potentially harmful environmental impacts are kept to a minimum, 3) resources are used effectively and efficiently, and 4) all required internal and regulatory reporting is completed on time and as required. This Plan outlines potential spill risks, roles and responsibilities, training and testing, available spill response equipment and spill response procedures.

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1. Introduction and Background

1.1. BACKGROUND

Sabina Gold & Silver Corp. (Sabina) is actively exploring the Back River property mineral rights Including the Goose Property (and primary exploration camp at Goose Lake), as well as George Property (and a temporary exploration camp), unoccupied claim groups referred to as Boot Property, Boulder Property, Wishbone Property, Malley/Needle Property, and Del Property (Figure 1) and development works for the Back River Project (the Project).

1.2. PURPOSE

This spill emergency plan has been implemented to ensure that Sabina respects all applicable laws, regulations and requirements from federal and territorial authorities. Sabina has obtained and complies with all required permits, approvals, and authorizations required for the operations. The following regulations and documents constitute an integral part of the Plan:

- Government of Nunavut's *Spill Contingency Planning and Reporting Regulations.*
- The Canadian Environmental Protection Act controls hazardous substances from their production and/or import, their consumption, storage and/or disposal.
- The federal *Fisheries Act* protects fish and their habitat from pollution and disturbances. Fisheries and Oceans Canada reviews permit applications and restoration plans submitted by other agencies.
- The federal *Transportation of Dangerous Goods Act* and Regulations ensure the protection of public health and safety, and the environment during the handling and transport of dangerous goods. The Regulations apply to all modes of transportation, by road, by sea, and by air.
- The federal *Territorial Land Use Regulations* define regulatory measures to maintain appropriate environmental practices for any land use activities on territorial lands that are under the control, management and administration of the Crown. These regulations require that land use permits be issued for operations such as mineral exploration and mining.
- The Guidelines for Preparation of Hazardous Material Spill Contingency Plans describe parameters that should be considered in the development of hazardous material spill emergency plans. It also defines the information that should be incorporated into a comprehensive contingency plan.
- The CCME Code of Practice for Used Oil Management defines appropriate environmental options for handling, storage, collection, recycling, transport, reuse, and/or disposal of used oils in Canada. It helps regulatory authorities formulate provincial and/or regional strategies for used oil management.
- The *Nunavut Environmental Protection Act* governs the protection of the environment from contaminants. The Act defines offences and penalties as well as the powers of government inspectors.
- The *Nunavut Spill Contingency Planning and Reporting Regulation*s describe requirements for spill reporting and emergency planning.

- The Field Guide for Oil Spill Response in Arctic Waters developed for the Emergency Prevention, Preparedness and Response Working Group, describes precise response methods and strategies for emergency response operations and provides technical support documentation.
- The *Land Transportation Emergency Response Guideline* for Petroleum Spills developed by the Canadian Petroleum Products Institute outlines scope, emergency response code of practice, response time guidelines, response equipment and personnel capability requirements.
- The *Canada Shipping Act* (CSA), as amended by Chapter 36, stipulates that operators of designated Oil Handling Facilities must have an on-site Oil Pollution Emergency Plan.
- The *Canada Shipping Act* Response Organizations and Oil Handling Facilities Regulations (sor/95-405) apply.

This document is a review and analysis of the preparedness for events which may occur due to unforeseen circumstances. The plan details response actions to be taken in the event of unintentional materials release during the ongoing exploration program and associated support such as camps and overland transport. The plan is dynamic and will be updated at least annually to address any significant changes in operating plans, should they occur.

A copy of the Plan will be available at the exploration camps and headquarter offices. **This plan applies to water licenses 2BE-GOO1520, 2BE-GEO1520, 2BE-MLL1722, and 8BC-BRP1718.** Sabina believes building on experience and practices gained through implementation and management of spill measures under existing water licence and supports the implementation of a coordinated approach to spill response.

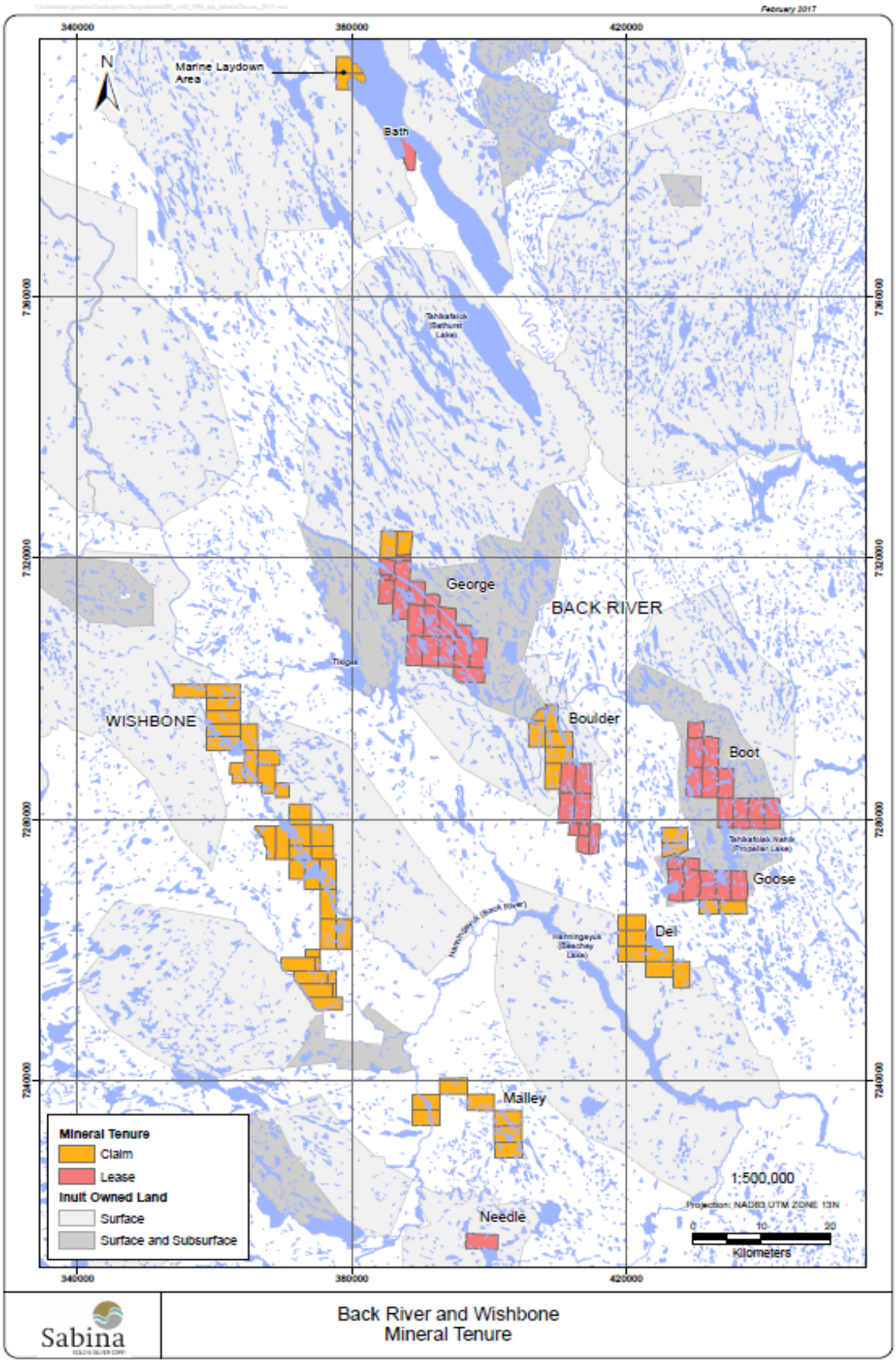


Figure 1. Location Map of Sabina Exploration Properties within western Nunavut.

1.3. SABINA SOCIAL AND ENVIRONMENTAL POLICY

Sabina is committed to environmentally responsible and socially acceptable exploration and mining practices. We are dedicated to creating and maintaining a safe environment for both the land we occupy and the people that drive its success. The company's philosophy is to conduct its operations to protect not only the environment, but the health and safety of its employees and the public as well.

Sabina also subscribes to the principles of sustainable development in mining. While exploration and mining cannot occur without an impact on the surrounding natural environment and communities, our responsibility is to limit negative environmental and social impacts and to enhance positive impacts.

To achieve these goals, Sabina is committed to:

- Seeking to be environmental leaders in the mining community by integrating responsible environmental management as an essential component of all business decisions;
- Comply with all applicable laws, regulations and standards; uphold the spirit of the law and where laws do not adequately protect the environment, apply standards that minimize any adverse environmental impacts resulting from its operations;
- Communicate openly with employees, the regulatory community and the public on environmental issues and address concerns pertaining to potential hazards and impacts;
- Assess the potential affects of operations and integrate protective measures into the planning process to prevent or reduce impacts to the environment and on public health and safety;
- Take appropriate corrective actions should unexpected environmental impacts occur. This will also include taking appropriate action to prevent reoccurrence of these impacts.
- Provide adequate resources, personnel and training so that all employees are aware of and able to support implementation of the environmental and social policy;
- Conduct and support research and programs that improve understanding of the local environment, conserve resources, minimize waste, improve processes, and protect the environment.
- Working with the appropriate local regulators and agencies, maximize benefits to the affected communities and residents;
- Balance all decisions with best management practices, scientific principles, and Traditional Knowledge.

1.4. SABINA POLICY ON INITIATION FOR CLEANUP ACTIVITIES

Sabina initiates cleanup activity when, in the opinion of management, Sabina is clearly associated, or likely associated with the spilled product. The guiding principles of Sabina’s Comprehensive Spill Contingency Plan is to comply or exceed existing regulations to ensure protection of the environment, and to keep employees, government officials, and the public aware of our plans.

1.5. RISK MANAGEMENT

The likelihood of a significant spill event occurring at the Project at either the Goose or George tank farms is very low, due to the double-walled tanks contained in the lined, bermed area, and the prescribed procedures for fuel transfer and anti-siphon devices in the tanks.

The greatest likelihood of an incident is associated with drummed fuel including the rupture of drums during movement or leaks during storage. The first risk can be mitigated through proper operator training

of equipment operation, clear marking and segregation of fuel supplies and heightened operator awareness when working near fuel supplies. The second risk is mitigated with secondary containment and frequent inspection of the drums (carried out during regular yard duties). Additional hazards are present during refuelling operations (mitigated with drip trays and absorbent mat), and during local drum movement (e.g., from storage to helipads), which is mitigated by using experienced operators, carefully securing the drums to the loader during movement, and safe driving practices.

As salt is delivered in pelletized form, any spill is easily cleaned-up. Regular inspection of this storage area will allow for rapid detection of any spill.

Explosives will be delivered in designated compartments approved for transport of explosives and stored within the original packaging in the magazines. Strict housekeeping and tracking standards will be kept. Any spill of explosive material would be easily cleaned up and regular inspection will allow for rapid detection of any spill.

Frequent inspections of the greywater line will turn up any leaks in the system which can be quickly repaired. Any issues would likely be noticed by most people in camp as either moisture and/or an odour would be present.

The likelihood of drill additives entering a waterbody is extremely small. With the exception of on-ice drilling, drills are located at least 31 m above the high water mark of lakes, ponds and streams, unless otherwise approved by the Board, with vegetation and overburden material providing an effective mechanical barrier to the transport of materials to the waterbody. As an added mitigation measure, geo-textile cloth fences are constructed on the downhill side of all new drill setups. For on-ice drilling, excess return water is pumped to a point on shore more than 31 m from the estimated high water mark (difficult to determine conclusively due to snow cover). Snow and lake ice also create an effective barrier and containment mechanism for spills of material at the drill site, allowing for easy cleanup. Drill sites are inspected for cleanliness upon completion of the hole.

Despite the mitigation measures taken, should any incident arise as a result of human error or unforeseen circumstances, the operating procedures outlined in this document will be implemented.

1.6. EXISTING FACILITIES

The Sabina mineral exploration camps are located in the Kitikmeot Region approximately 520 km northeast of Yellowknife, NWT and 400 km southwest of Cambridge Bay, NU.

1.6.1. Goose Exploration Camp

The Goose Exploration Camp is the primary camp for the Project and is located on the slope of the western shore of Goose Lake (Figure 2). It has the capacity to support up to 120 people (as of June 2012) and is accessible by air only using Goose Lake (ice and open water), a gravel airstrip north of Goose Lake and an all-weather airstrip and road west of the camp. The lakeshore is approximately 50 m toward the north and the regional topographical gradient surrounding the camp ranges from 2 to 6% towards the north. The camp is approximately 300 m in length from east to west and 100 m wide from north to south, covering an area of 30,000 m^2. The camp facilities are located on natural tundra underlain by a 10 cm organic layer overlying silt-sand parent material.

- Latitude: 65º 32’N, Longitude: 106º 25’W
- UTM Coordinates 569405 E, 7265007N on NTS Map Sheet 76G/09



Figure 2. Aerial image of Goose Exploration Camp looking west. Photograph taken August 2013.

1.6.2. Temporary Camps for Resupply for Exploration

Temporary camps for up to 20 people are established for a season in target areas away from the main camps and would be established for safety, environmental, and economic reasons. The intent is not to establish a network of camps across the exploration area, but to have the opportunity and flexibility to establish these temporary camps as needed. No sewage system will be installed in the camp as no water is needed for Pacto toilets. All solid waste will be carried to the existing camps (Goose and/or George) and disposed as outlined in the approved waste management plan.

Grey-water is pumped to a suitable disposal sump or natural depression located 31 metres away from the ordinary high water mark of any local waterways and would be allowed to naturally percolate into the underlying ground.

1.6.3. Overland Corridors

A winter road links the two camps (Goose and George) and extends to Bathurst Inlet. Temporary camp facilities and fuel and chemical storage areas may also be accessed as needed to support exploration activities.

Overland transportation occurs during mid-February to mid-May depending on environmental conditions and operational requirements. Environmental conditions that will determine the route include:

- Ice thickness of a sufficient thickness to support heavy equipment so that pumping and using water to build up will be unnecessary.
- Snow thickness will be a minimum of 15 cm on land to prevent damage to soil and vegetation.
- Weather conditions permit safe transport of equipment and materials.

Diesel fuels and lubricants will be used during the construction and operation of the winter road. Other fuel and materials to be transported along the corridor include diesel fuel, aviation gas, drilling additives such as calcium chloride and construction materials.

Storage of these products and wastes will be in compliance with legislation and the National Fire Code that ensures the hazardous materials are stored safely, in a dry manner with clear labeling and secondary containment. All storage areas will be clearly identified with proper labeling and signage. All storage areas will be regularly inspected and stored at least 100m from the high water mark of any waterbody within secondary containment.

Material Safety Data Sheets (MSDS) information for the potential contaminants and products to be transported along the winter road are available on-site.

2. Materials Transport and Storage

2.1. FUEL STORAGE

As per 2BE-GOO1520 and 2BE-GEO1520, diesel fuel is required to generate power on-site, heat buildings, and to fuel mobile equipment. The diesel fuel storage at the camps consists of 205 L drums, as well as double walled tanks (up to 75,000 L ULC-approved) and bladders (up to 40,000 L) situated within a lined secondary berm. Secondary containment (Instaberms) is used for all of the drummed fuel on-site.

Supplies will be replenished with quantities dependent on the scope of the program. Inventories of fuel at each site are dynamic and dependent on exploration activities and personnel in camp.

Drummed fuel is required to support drilling and helicopter activities outside of camp and strategically relocated as required. All drums are located at least 30 m above the high water mark of any waterbody. Specialized oils and greases used by the drilling contractors are stored in sheds or sea-cans designated for that purpose. Propane tanks are stored on pallets, strapped together, and area marked with pylons.

For development works no additional fuel storage is required at the Goose Property; existing permitted fuel requirements under 2BE-GOO1520 will be maintained. The Goose Property has thirteen 75,000 L double walled tanks and one 40,000 L bladder. Fuel required to support development works, ongoing exploration activities, and environmental monitoring programs, will be initially mobilized to the MLA in twenty approximately 30,000 L double walled fuel tanks. These tanks are installed within tertiary arctic-grade Insta-berms. This temporary storage of fuel is required as permanent storage tanks are under construction. As built drawings, will be provided 90 days following installation.

One 15 ML field erected fuel tank will be constructed at the MLA. Construction of the fuel tank and the fuel storage area and transfer facilities is proposed to occur under this Application; however, Sabina does not intend to mobilize fuel into this tank as part of this Type B Water Licence. The MLA Fuel Storage Area will be constructed in conformance with the Canadian Council of Ministers of the Environment (CCME) Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products (CCME 2003), and the Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (2008). Project fuel storage facilities will be designed to have bermed spill containment with capacity equal to the volume of the largest tank plus 10% of the volume of the remaining tanks, or 110% volume of the largest tank, whichever is greater. The fuel tank storage areas embankments (or bund) will be lined with HDPE for spill containment. The fuel storage areas will be provided with standard instrumentation and controls to monitor and safely manage the inventory in the tanks. For additional information related to the design of the fuel storage facilities, please see the Fuel Management Plan. Sabina is committed to provide detailed designs for construction of the 15 ML fuel storage and fuel transfer facilities at the MLA to the NWB at least 60 days prior to construction.

2.2. DOMESTIC GREYWATER, SEWAGE AND CONTACT WATER

Greywater from the kitchen and shower facilities is screened for coarse particles (e.g., food), and released to a sump for settling, after which it is released to the environment. Sewage is dealt with using a Pacto toilet system with incineration of the waste generated.

Contact water is water that collects within the fuel secondary containment berms. This water is transferred out of each containment once the depth of water is equal, or greater, than 10 cm and treated

using oil/water separator. Post treatment, the contact water is contained within a dedicated berm/tank system and tested for compliance with current water licence thresholds. If in compliance with current thresholds of the water licence it is released to the environment.

For development works no additional management of domestic greywater, sewage and contact water is required. Management will be done in accordance with 2BE-GOO1520 and 2BE-GEO1520 water licence terms and conditions.

2.3. SOLID WASTE

Combustible solid wastes generated from the camp activities are incinerated. Products such as putrescible domestic and office waste are burned. Noncombustible wastes such as scrap metal, non-reusable barrels, incinerator ash, etc., are placed in megabags and are removed from site using back-haul flights to Yellowknife. Hazardous solid waste for backhaul is sealed in drums for transport to Yellowknife.

Although the potential for waste rock (including drill core) currently stored to be acid producing is unlikely, any such waste would be disposed of in an approved location and under acceptable practices.

Drill cuttings are collected and returned from the drill location to Goose Exploration Camp for disposal in the trench. Sludge from the core saws is also collected and disposed in the exploration trench south of camp.

For development works no additional management of solid waste is required. Management will be done in accordance with 2BE-GOO1520 and 2BE-GEO1520 water licence terms and conditions.

2.4. CHEMICALS

Sabina is committed to the safe and proper handling of waste materials to ensure minimal environmental impact and land disturbance. Waste chemicals that require special attention and handling include waste oil, hydraulic oil, lubricating oil, calcium chloride, grease, and ethylene glycol.

Waste oil is used to either, heat the warehouse, maintenance and core logging facilities, or to fuel the incinerator at Goose Exploration Camp. If not used to fuel heaters or incinerator, waste oil and oil from filters are backhauled for appropriate disposal. Drained spent oil filters will be stored in drums for removal from the site for disposal at an authorized disposal facility.

There are minimal quantities of reagents such as dilute HCl (<5L), concentrated HNO_3 (vials of <10mL), and other materials on-site for geological testing and environmental sample preservation.

Sabina anticipates the maximum quantity of ammonium nitrate (in sold form) at the MLA during initial development works at any time during the calendar year to be 1525 tonnes.

Calcium chloride is added to the fresh water to form a brine solution that acts as antifreeze when drilling in permafrost conditions. The drilling return water is reheated and reused using a mega-bag system which catches the drill cuttings as well. Salt is stored in bags, with 28 sealed in a megabag and placed on a pallet.

Explosive products, when/if on-site, will be stored in appropriate facilities at designated explosives storage site(s).

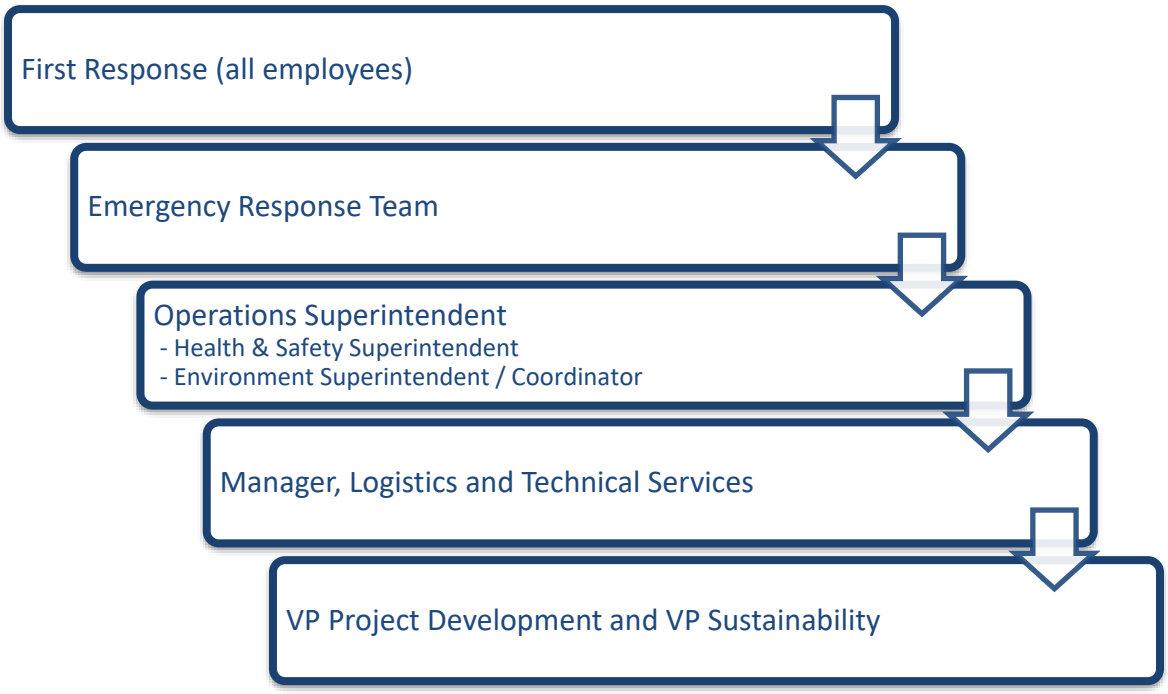
Fire extinguishers and dust suppression is also used on-site as needed and is stored in appropriate facilities. Small quantities of various household chemicals are on-site for domestic use.

MSDS will be collected and kept at the site for all chemicals and fuel products. Appropriate storage and handling of these products will be undertaken.

For development works no additional management of hazardous waste is required. Management will be done in accordance with 2BE-GOO1520 and 2BE-GEO1520 water licence terms and conditions.

3. Roles and Responsibilities

The general response and notification chart is presented in the following:



3.1. ALL EMPLOYEES (FIRST RESPONDERS)

- Immediately warn other personnel working near the spill area.
- Evacuate the area if the health and safety of personnel is threatened.
- Notify direct supervisor or Site Superintendent, who will initiate the spill response operations.
- In the absence of danger, take any safe and reasonable measure to stop, contain and identify the nature of the spill.
- Participate in spill response as directed by the Site Superintendent.

3.2. EMERGENCY RESPONSE TEAM (SPILL CLEANUP CREW)

- Members determined by Site Superintendent based on response needs.
- Conduct cleanup of significant spills under direction of Site Superintendent.

3.3. SITE SUPERINTENDENT

- Assemble and manage the Emergency Response Team, as required.
- Ensures cleanup is completed to Sabina standards in line with direction from the Manager, Logistics and Technical Services (TS), Health & Safety Superintendent, Environmental Superintendent and Environmental Coordinator.

- Notify Manager, Logistics and TS, Health & Safety Superintendent, and Environmental Superintendent/Coordinator of incident.
- Provides update within Sabina in camp and headquarters.
- Record date, location (GPS), material spilled, volume, reason for release, any negative impact, status of cleanup, and corrective actions taken.
- Keep and maintain database of all reportable and non-reportable spills as identified in the Plan.
- Conducts ongoing monitoring of cleanup operations leading to close-out.
- Notify HQ staff including VP Project Development and VP Sustainability for any reportable spills as identified in this plan
- Classify spill level as minor, moderate or major and ensure appropriate response initiated
- Assists in developing effective spill management and prevention practices.
- As directed by the VP Project Development and Manager, Logistics and TS report spill to 24-hour Spill Reporting Line.
- Liaise with NWT/NU applicable agencies regarding on-going cleanup activities.
- Co-ordinate inspections and spill closure by applicable agencies.
- Assist in spill response training and exercises.

3.4. MANAGER LOGISTICS AND TECHNICAL SERVICES

- Provides advice and ensures cleanup is completed to Sabina standards in line with direction from the Site Superintendent and VP Sustainability.
- Ensures Emergency Response Team is adequately trained in spill response.
- Ensures Emergency response and/or monitoring equipment and supplies are regularly inspected and maintained
- Organize with Site Superintendent spill response training and exercises.
- Lead investigation and identify measure and/or training to prevent similar spills.

3.5. ENVIRONMENTAL SUPERINTENDENT AND COORDINATOR

- Provides advice and ensures spill is documented appropriately as per this plan and regulatory requirements.
- Record date, location (GPS), material spilled, volume, reason for release, any negative impact, status of cleanup, and corrective actions taken; confirm these details with Site Superintendent.
- Obtain photographs of spill site before cleanup starts if possible and after the cleanup has been completed. Take pictures of undisturbed area beside the spill area for a comparison. If spill occurs on snow, stake or otherwise identify the affected area so that it can be evaluated once the snow melts.
- As directed by the VP Sustainability and Site Superintendent liaise with NWT/NU applicable agencies regarding on-going cleanup activities, inspections and incident closure
- Assist in initial and ongoing response efforts.
- Provide advice to assist with cleanup.
- Co-ordinate inspections and spill closure by applicable agencies.
- Assist with investigation and identify measure and/or training to prevent similar spills.

3.6. HEALTH & SAFETY SUPERINTENDENT

- Assist in initial and ongoing response efforts.
- Provide advice to assist with cleanup.
- Assist with investigation and identify measure and/or training to prevent similar spills.

3.7. VP PROJECT DEVELOPMENT AND VP SUSTAINABILITY

- Engage Legal Counsel and Sabina Senior Management and Board of Directors as required.
- Notify and update Senior Management and Board members as required.
- Notify and communicate with the Kitikmeot Inuit Association regarding any spills reported to the NT/NU Spill Report Line

4. Training and Testing

4.1. TRAINING

4.1.1. Site Orientation

On-site orientation will be provided to all on-site personnel to ensure employees are aware of:

- What First Responders are to do in case of a spill.
- The location of MSDS sheets and Spill Report Forms.
- The location of the Spill Response Kits.
- The general locations of fire extinguishers and firefighting equipment.
- The location of the Spill Action Plan and the Fire Action Plan.

4.1.2. Role Specific

Specific on-site training will be provided to all employees, whose job function may have a higher probability of experiencing a spill, to ensure they are aware of:

- WHMIS and Transportation of Dangerous Goods.
- Identify and avoid the conditions which may lead to a spill.
- Develop an understanding of the potential environmental impacts of a spill.
- Develop and understanding of the financial costs of a spill.
- Recognize the hazards associated with sources of ignition (smoking, electrical sparks) near a fuel source.
- Spill kit contents and use of them.
- Turn off valves to stop the flow of fuel.

For employees involved in fuel handling, additional training would be provided regarding appropriate refuelling techniques and drum handling procedures.

4.1.3. Emergency Response Team

Members of the Emergency Response Team will be provided a higher level of training to allow for safe and adequate response. This includes:

- All information given as part of the Role Specific Training.
- Fire extinguishers and water pump locations and use.
- Details of the Spill Action Plan and the Fire Action Plan.
- Identify, evaluate and mitigate the hazards posed by any spilled product by using appropriate PPE (personal protective equipment).

4.1.4. Community Support

Sabina is committed to providing spill response training to representatives of the communities of Kingaok and Umigmaktok. This includes:

- Spill training;
- Emergency response; and
- Notification.

4.2. TESTING

A spills drill is to be held twice annually, approximately 6 months apart, at each field operation. This drill must include a familiarization of all on-site personnel on their responsibilities including what to do in case of a spill. The drill must also include a hands-on scenario where the Emergency Response Team utilizes equipment to deal with the spill scenario. The drill may be broken down into two or more sessions to ensure adequate coverage. Records of this testing are to be kept on file and posted to provide access for those who were unable to attend.

5. Spill Response Equipment

5.1. GENERAL EQUIPMENT

Heavy equipment and aircraft may be used in the area for emergency use to respond to spill incidents. Spill kits and spill response equipment are to be located in key locations and are to be accessible to responders.

Site specific maps illustrating spill kit locations onsite can be found in Appendix D. Sabina will post these maps at every operating site.

5.2. SPILL KITS

Table 1. Location of Spill Kits.

Goose Exploration Camp	Marine Laydown Area	Communities
Tank Farm	Shoreline Pad	Kingoak*
Drummed Fuel Storage	Freight Storage Pad	Umigmaktok*
Generator Buildings	Generator	
Coreshack	Camp Location	
Drum Crusher	Temporary AN and Fuel Storage	
Incinerator	Construction Laydown Pad	
Helipad Area	Mechanics Shop	
Dock	Quarry Area	
Each Diamond Drill		
South Quonset		
Shop North Quonset		

**will include standard spill kit and nuisance kit (or similar)*

Table 2. Spill Kit Contents.

Quantity	Item(s)
1	45 gal, 16 Gauge Open Top Drum, c/w Bolting Ring & Gasket
20	Short Putty Epoxy Sticks
1	48” x 48” x 1/16” Neoprene Pad (Drain Stop)
1	Splash Protective Goggles
1	Pkg. - Polyethylene Disposable Bags (5 ml) 10 per Package
1	Shovel (Spark Proof)
1	Case T-123” x 10’ Absorbent Boom, 4-Booms/Case;
1	Pkg. – Universal absorbent Mats, 16 ½” x 20”, 100 Mats per Package
1	Roll – Oil only absorbent mats 150’ x 33”
1	16’ Aluminum Boat (at MLA only)

** Drill rigs are equipped with a roll of absorbent mat for minor spills. Other appropriate equipment for spill response (PPE, shovel, bags) is typically already located at the drill for general use.*

5.3. MOBILE RESPONSE UNIT

A mobile Environmental Response Unit is available to Sabina from a major fuel supplier (Shell) in Yellowknife or Cambridge Bay. This unit can be transported to the site from Cambridge Bay in less than three hours weather permitting.

6. Spill Response Procedure

A spill is defined as the discharge of a hazardous product out of its containment and into the environment. Potential hazards to humans, vegetation, water resources, fish, and wildlife vary in severity, depending on several factors including nature of the material, quantity spilled, location, and season. Fuel is the main product that may be spilled and therefore spill response procedures focus on this hazardous material. Other chemicals that may be spilled include sewage water, and small quantities of lubricants and oils.

All site personnel are briefed on the procedures to be followed to report a spill and initiate spill response. The first person to notice a spill must take the following steps:

- Immediately warn other personnel working near the spill area.
- Evacuate the area if the health and safety of personnel is threatened.
- Notify their direct supervisor or Site Superintendent, who will initiate the spill response operations.
- In the absence of danger, and before the spill response team arrives at the scene, take any safe and reasonable measure to stop, contain and identify the nature of the spill.

The following details the steps to be taken in the event of a spill. Steps are listed in order of importance; however, circumstances and conditions may alter the order of these steps to meet a specific situation.

6.1. SOURCE CONTROL

Reduce or stop the flow of product without endangering anyone. This may involve very simple actions such as turning off a pump, closing a valve, sealing a puncture hole with almost anything handy (e.g., a rag, a piece of wood, tape, etc.), raising a leaky or discharging hose at a level higher than the product level inside the tank, or transferring fuel from leaking containers.

6.2. CONTROL OF FREE PRODUCT

Prevent or limit the spread of the spilled material. Accumulate/concentrate spilled product in an area to facilitate recovery. Barriers positioned down-gradient of the spill will slow or stop the progression of the spill. Barriers can consist of absorbent booms, dykes, berms, or trenches (dug in the ground or in ice).

6.3. PROTECTION

Evaluate the potential dangers of the spill in order to protect sensitive ecosystems and natural resources. Block or divert the spilled material away from sensitive receptors. This can also be achieved by using various types of barriers.

6.4. CLEANUP THE SPILL

Recover and containerize as much free product as possible. Recover and containerize/treat contaminated soil, water, and snow. Pressure-wash contaminated bedrock surfaces, shorelines, ice and recover as much as possible oily water for containerization and/or treatment.

6.5. CLEAN REPORT THE SPILL

Provide basic information such as date and time of the spill, type and amount of product discharged, photographic records, location and approximate size of the spill, actions already taken to stop and contain the spill, meteorological conditions and any perceived threat to human health or the environment.

6.6. RESPONSE BY SPILL LOCATION

6.6.1. Spills on Land

Response to spills on land will include the general procedures previously detailed. The main spill control techniques involve the use of two types of barriers: dykes and trenches. Barriers should be placed down-gradient (down-slope) from the source of the spill, and as close as possible to the source of the spill. Barriers slow the progression of the fuel and also serve as containment to allow for recovery.

Depending on the volume spilled, the site of the spill as well as available material, a dyke may be built with soil, booms, lumber, snow, etc. A plastic liner should be placed at the foot of and over the dykes to protect the underlying soil or other material and to facilitate recovery of the fuel. Construct dykes in such a way as to accumulate a thick layer of free product in a single area (V shaped or U shaped).

Trenches are useful in the presence of permeable soil and when the spilled fuel is migrating below the ground surface. A plastic liner should be placed on the down-gradient edge of the trench to protect the underlying soil. Liners should not be placed at the bottom of the trench to allow water to continue flowing underneath the layer of floating oil.

The use of large quantities of absorbent materials to recover important volumes of fuel should be avoided. Large volumes of free-product should be recovered, as much as possible, by using vacuums and pumps, and containerized. Mixtures of water and fuel may be processed through an oil-water separator. Absorbent sheets should be used to soak up residual fuel on water, on the ground (soil and rock), and on vegetation.

6.6.2. Spills on Water

Response to spills on water includes the general procedures previously detailed. Various containment, diversion and recovery techniques are discussed in the following sections. The following elements must be taken into consideration when conducting response operations:

- Type of waterbody or water course (lake, ocean, stream, river).
- Water depth and surface area.
- Wind speed and direction.
- Resonance and range of tides.
- Type of shoreline.
- Seasonal considerations (open-water, freeze-up, break-up, frozen).

Containment of an oil slick on the ocean requires the deployment of mobile floating booms to intercept, control, contain and concentrate (i.e., increase thickness) the floating oil. One end of the boom is anchored to shore while the other is towed by a boat or other means and used to circle the oil slick and return it close to shore for recovery using a skimmer. Reducing the surface area of the slick increases its

thickness and thereby improves recovery. Mechanical recovery equipment (i.e., skimmers and oil/water separators) will be mobilized to site if required.

If oil is spilled in a lake it may not be possible to deploy booms using a boat. In this case, measures are taken to protect sensitive and accessible shoreline. The oil slick is monitored to determine the direction of migration. In the absence of strong winds the oil will likely flow towards the discharge of the lake. Measures are taken to block and concentrate the oil slick at the lake discharge using booms where it will subsequently be recovered using a portable skimmer, a vacuum, or sorbent materials.

In small slowly-flowing rivers, streams, channels, inlets or ditches, inverted weirs (i.e., siphon dams) is used to stop and concentrate moving oil for collection while allowing water to continue to flow unimpeded. In the case of floating oil, in a stream, heading for a culvert (i.e., at a road crossing) a culvert block is used to stop and concentrate moving oil for collection while allowing water to continue to flow unimpeded. In both cases oil will then be recovered using a portable skimmer or sorbent materials.

In the case of spills in larger rivers, with fast moving currents, diversion booming is used to direct the oil slick ashore for recovery. Single or multiple booms (i.e., cascading) may be used for diversion. Typically, the booms are anchored across the river at an angle. The angle will depend on the current velocity. Choosing a section of a river that is both wider and shallower makes boom deployment easier. Diversion booming may also be used to direct an oil slick away from a sensitive area to be protected.

For development works, spills in the marine environment with be managed in accordance with the Oil Pollution Emergency Plan (OPEP) and the Shipboard Oil Pollution Emergency Plan (SOPEP) required by Transport Canada.

6.6.3. Spills on Snow and Ice

In general, snow and ice will slow the movement of hydrocarbons. The presence of snow may also hide the oil slick and make it more difficult to follow its progression. Snow is generally a good natural sorbent, as hydrocarbons have a tendency to be soaked up by snow through capillary action. However, the use of snow as a sorbent material is to be limited as much as possible. Snow and frozen ground also prevent hydrocarbons from migrating down into soil or at least slow the migration process. Ice prevents seepage of fuel into the water.

Response to spills on snow and ice includes the general procedures previously detailed. Most response procedures for spills on land may be used for spills on snow and ice. The use of dykes (i.e., compacted snow berms lined with plastic sheeting) or trenches (dug in ice) slow the progression of the fuel and also serve as containment to allow recovery of the fuel. Free-product is recovered by using a vacuum, a pump, or sorbent materials. Contaminated snow and ice is scraped up manually or using heavy equipment depending on volumes. The contaminated snow and ice is placed in containers or within plastic lined berms on land. If required, a contaminated snow storage site is to be located in close proximity to one of the four (4) main work sites to facilitate inspection and monitoring, in an area which is still easily accessible once it is time to remove the snow (i.e., spring or summer), and at least 30 m away from any body of water or ditch. Once enough snow has melted, the oily water is removed from the storage and processed through an oil-water separator that would be mobilized to site. Hydrocarbons recovered will be burned in the camp incinerator or shipped off-site for processing.

6.7. RESPONSE BY MATERIAL SPILLED

6.7.1. Fuel

Detection of leaks will be using two methods - a fuel inventory reconciliation and inspection. A weekly reconciliation of storage volumes will be completed and a spill response will be initiated in the event of any unexplained loss over five or more weeks.

Weekly inspections will be conducted to ensure either there has not been a leak or that the conditions of the area could result in a leak. These inspections will include the fuel drums and storage containers, secondary containment sumps and associated spill containment devices, any pumps and product-handling equipment, and an overfill protection devices. These inspections will be recorded to include who completed the inspections, areas included in the visual inspection and any deficiencies noted.

Fuel spills, leaks at storage facilities or vehicle accidents will be handled by following these steps:

- Identify the source of the leak or spill.
- Contact the Environmental Coordinator/Site Superintendent.
- Stop leaks from tank or barrel by.
- Turning off valves.
- Utilizing patching kits to seal leaks.
- Placing plastic sheeting at the foot of the tank or barrel to prevent seepage into the ground.
- Contain the spill and the source if possible.
- Take photographs of the spill site before and after the cleanup.

Small spills will be cleaned up by removing the contaminated soil and storing it in empty 205 L drums for backhaul and disposal at an approved hazardous waste disposal site. Should a large spill occur, cleanup and disposal efforts will be coordinated as necessary with the appropriate authorities and agencies.

Further information on the handling of fuel spills is detailed in Appendix 2.

6.7.2. Domestic Sewage, Solid Waste, and Contact Water

Any problems with the incinerator or other waste disposal mechanism will be immediately reported to the Site Superintendent.

In the event of a power failure, the stand by generator will be put into operation as soon as possible. Similarly, in the case of a pump failure, the backup pump will be put on-line. Any greywater drainage problems will be addressed as quickly as possible to minimize the chance of a spill. As necessary appropriate safety equipment and personal protective clothing will be available to site personnel.

6.7.3. Chemical

Assess the hazard of the spilled material by referring to the relevant MSDS sheet. Each response will vary based on the material. If the chemical is hazardous, ensure personnel protective equipment is utilized (latex gloves, eye protection, etc.) before approaching the spill. As chemicals are only used in extremely small quantities on-site use absorbent mats to soak up spilled liquids and place in appropriate container for treatment and/or disposal.

6.8. RESPONSE TO A FIRE

Various products, including fuel, may be flammable under certain circumstances. It is important to ensure that the spill does not present a risk of fire prior to commencing the cleanup. If a fire does break out refer to relevant site firefighting procedures.

6.9. DISPOSAL

Appropriate disposal, as directed by the Environmental Manager, for any recovered product and contaminated soil, water, or absorbent cleanup material is regulated and must be authorized by the agency investigating the incident. Obtain approval from all appropriate government agencies before disposal. A hazardous waste generator number has been acquired and used by the expeditor when disposing of camp waste.

Fuel contaminated soil can be remediated at camp through incineration or alternatively, the contaminated soil can be flown out to Yellowknife for disposal in an approved disposal/treatment site.

Any non-reusable recovered product, contaminated soil and cleanup material, which cannot be incinerated, will be stored in containers and returned to camp prior to disposal.

7. Spill Potential Analysis

7.1. CAMPS

7.1.1. Fuel

Fuel spills could potentially occur from:

- Fuel storage containment (tanks, barrels) leaks.
- Spills during drum transport from aircraft to fuel storage area.
- Spills from vehicles or equipment as a result of accidents.
- Spills during fuel transfer from barrels to equipment or heaters.
- Spills during transport from barge to fuel storage area.
- Spills during marine transport.

Spills occurring during fuel handling, transfer, or storage operations will be minimized by:

- Secondary containment and/or drip trays.
- Proper storage of barrels.
- Inspections of the storage facilities and barrels.
- Inventory tracking.
- Staff training in proper fuel handling procedures.
- Spill response training for personnel associated with fuel handling.
- Immediate cleanup of minor spills.
- Enclosing spigots on fuel containers with absorbent mat to collect any slow drips.
- Fuel line walkers will be used to monitor the fittings etc. during fuel transfers
- Implementation of approved OPEP and SOPEP for transport in marine waters.

The potential for spills affecting surface waters is low, as fuel storage and transfer points are located away from watercourses and lakes. Close inspection of fuel transfer activities will be undertaken during all times while fuel is being pumped/transferred to equipment. Secondary containment will be used at all refuelling points and storage areas.

7.1.2. Domestic Sewage and Solid Waste

Waste from the kitchen and Pacto systems are carried to the incinerator in a small trailer, with virtually no risk of spillage. The greywater lines are routinely inspected for leaks and repaired as necessary. The screens at the greywater sump are cleaned of debris daily.

7.1.3. Solid Waste

Failures may occur in the handling of solid waste through the following situations:

- Incinerator at Goose Exploration Camp fails.
- Accidental damage to the incinerator and it components, or the heaters and/or their fuel supplies.
- Mechanical breakdown.
- Improper maintenance.

Visual inspection of the incinerator and its combustion products will be carried out frequently, typically in the normal course of operation. The incinerator will be operated according to the manufacturer's instructions.

7.1.4. Chemicals

Any chemicals brought on-site are stored in manufacturers' approved packaging. Although unlikely, leaks may occur resulting in minor spills of chemical product in storage. It is more likely a leak will occur during the transfer of chemicals or from accidental failure of containers.

Sabina provides training to its staff in product handling and inspection procedures, which we feel, will result in reduced occurrences of chemical spills.

7.2. OVERLAND TRANSPORT

The following table identifies possible incidents which may occur along the winter and all-weather road, the consequences of that incident and the preventative measures to be implemented.

Table 3. Summary of Potential Incidents and Preventative Measures along Transportation Corridors

Incident	Description	Consequences	Preventative Measures
Refuelling of vehicles	Refuelling hose could break, spring a leak, overfilling of equipment tank, spillage from gas storage tank	Puddles of fuel over limited area Hose breaks at equipment and sprays a large amount of fuel over a larger area "slick" flows steadily from equipment	All refuelling will occur in area 30m from waterways in designated areas Personnel will be aware of emergency shut-off valves and trained in spills response Spill Kit available Refuelling occur within containment and/or absorbent material in place
Vehicle storage and operation	Vehicles could leak fuel while in operation or during a stop along route.	Puddles of fuel over limited area to the entire contents of a tank being discharged.	Vehicles will stop 31 m from waterways Vehicles parked on ice will have absorbent material placed underneath Personnel will be trained in spills response Spill Kit available
Fuel containers leaking	Fuel being brought to the vehicles could leak fuel while in operation or during a stop along route.	Puddles of fuel over limited area to the entire contents of a tank being discharged.	Regular visual inspection will occur to ensure tanks are not leaking Personnel will be trained in spills response Spill Kit available

(continued)

Table 3. Summary of Potential Incidents and Preventative Measures along Transportation Corridors (completed)

Incident	Description	Consequences	Preventative Measures
Vehicle accident	Accident on road that involves equipment going off road/overturning	This worst case scenario could result in a tank of fuel and any materials being transported spilling entire contents over a large area.	Safe road corridor will flagged Speed limits will be in effect Transportation of Dangerous Goods manifest if necessary Coordination and communication between the cat-haul and camps will be maintained Camp personnel will be ready to mobilize in case of accident Spill kit available with cat-haul and on-site
Temporary fuel storage leakage and/or spill	Fuel caches leak fuel or due to accident contents are spilled	Puddles of fuel over limited area Storage container breaks and fuel spreads over a larger area	All storage will occur in area 30m from waterways Secondary containment berms will be used for fuel caches Personnel will be aware of emergency shut-off valves and trained in spills response Spill Kit available Regular monitoring and inventory tracking will occur at these remote/temporary fuel storage areas
Calcium Chloride spill	Bags of salt could be torn and spilled in temporary storage area or in transport	Tears and bag breakages could lead to salt spread over limited area Bags could break in a manner that salt is spread over a larger area	Personnel will be trained in proper material handling and transport methods Salt will be stored and transported in 50lb bags on pallets wrapped in plastic Secondary containment will be used at temporary storage locations Spill kits and equipment available.

7.3. FIRE PREVENTION

The most serious spill incident would involve fire and a hydrocarbon-based fuel source. To minimize the risk of fire, **No Smoking** and **Flammable** signs will be posted as needed at storage areas and with the cat-haul train along with a dry chemical fire extinguisher. Workers will be trained in the use of the fire extinguisher and be instructed of the risk caused by electrical and open flame fire hazards near fuel.

8. Reporting Procedures

All spills are to be reported to the Site Superintendent or their designated representative. It is their responsibility to notify headquarters staff and external parties as outlined in the roles and responsibilities of this plan.

An internal log of spills, no matter how small, is to be kept and maintained by the Site Superintendent. Each record will include date, location, material spilled, volume, reason for release, any negative impact, status of cleanup, and corrective actions taken. Photo's (before, during and after cleanup) shall also be taken of all significant spills. To assist with internal tracking a Sabina Spill Form is included in Appendix C.

Reportable spills, as identified in this plan, are to be externally reported to the NWT/Nunavut Spill Response Line. The Site Superintendent will ensure spills are reported externally as required. The Spill response form (Appendix C) is to be completed for all externally reported spills and forwarded to the NWT/Nunavut Spill Response Centre within the required 24 hour reporting period. The Manager, Logistics and TS, or their designate, will notify Sabina Headquarter senior management of any reportable spills as listed below.

Any spill, or incident that may likely result in a spill, of an amount equal to or greater than the amount listed in the table below shall be promptly externally reported. Spills adjacent to or into a surface water or ground water access shall be externally reported regardless of quantity.

Spills within secondary containment will be reported and included in the internal log. In the situation that the spill within the containment is above the thresholds noted below, an external report to the NWT/Nunavut Spills will be submitted if the spill exceeds 40% capacity of the secondary containment.

Notification of spills within the marine environment will also be provided to community representatives of Kingaok and Omingmaktok.

Table 4. External Reporting Volumes

TDGA Class	Description of Contaminant	Amount Spilled
1	Explosives	Any amount
2.1	Compressed gas (flammable)	Any amount of gas from containers with a capacity greater than 100 litres
2.2	Compressed gas (non-corrosive, non-flammable)	Any amount of gas from containers with a capacity greater than 100 litres
2.3	Compressed gas (toxic)	Any amount
2.4	Compressed gas (corrosive)	Any amount
3.1, 3.2, 3.3	Flammable liquid	100 litres
4.1	Flammable solid	25 kg
4.2	Spontaneously combustible solids	25 kg
4.3	Water reactant solids	25 kg
5.1	Oxidizing substances	50 litres or 50 kg
5.2	Organic Peroxides	1 litre or 1 kg
6.1	Poisonous substances	5 litres or 5 kg
6.2	Infectious substances	Any amount
7	Radioactive	Any amount
8	Corrosive substances	5 litres or 5 kg
9.1 (in part)	Miscellaneous products or substances,	50 litres or 50 kg
9.2	Environmentally hazardous	1 litre or 1 kg
9.3	Dangerous wastes	5 litres or 5 kg
9.1 (in part)	PCB mixtures of 5 or more parts per million	0.5 litres or 0.5 kg
None	Other contaminants	100 litres or 100 kg

Appendix A. Sabina Spill Response Team

(will be reviewed and updated on an as-needed basis)

Sabina Contacts:

Environmental Engineer	Merle Keefe	(604) 998-4175
Exploration Manager	James Maxwell	(604) 998-4175
Site Superintendent - Goose	Rob Davidson	(867) 975-3318
Site Superintendent - MLA	Jaymes Dircks	(867) 681-0156
VP Sustainability	Matthew Pickard	(604) 998-4175
Environmental Coordinator	Mitchell Kearney	(867) 681-0156

Additional assistance may be obtained, as necessary, from the following organizations:

Det'on Cho Logistics	(867) 873-6970
Shell Canada, Mobile Environmental Response	(867) 874-2562
Kitnuna	(867) 983-7500
Nuna Logistics Ltd.	(866) 817-0924
Dupont (Fuel Dye)	(905) 821-5660
Frontier Mining (Sorbents)	(867) 920-7617
Acklands (sorbents)	(867) 873-4100 (867) 920-5359

Key Government Contacts:

NWT/NU 24hr Spill Report Line		Fax: 867-873-6924 Email: spills@gov.nt.ca
Nunavut Water Board	Stephanie Autut, Exec. Director Karén Kharatyan, Technical Advisor	(867) 360-6338
Kitikmeot Inuit Association	John Roesch, Senior Project Office	(867) 983-2458
Environment and Climate Change Canada	Craig Broome, Manager of Enforcement Wade Romanko, Env. Emergencies Officer	(867) 669-4730 (867) 669-4736
Indigenous and Northern Affairs Canada	Primary: Andrew Keim, Manager of Field Operations Eva Paul, Water Resources Officer Baba Pederson, Resource Management Officer	T: (867) 975-4295 F: (867) 975-6445 (867) 982-4308 (867) 975-4296
Government of Nunavut Environmental Protection	Robert Eno, Director Environmental Protection	(867) 975-7729
Department of Fisheries and Oceans	Suzanne Erkidjuk, Area Admin Clerk	(867) 979-8000
RCMP (Yellowknife)		(867) 669-1111
RCMP (Cambridge Bay)		(867) 983-2111

Appendix B. Procedure In The Event Of A Spill

Priority 1 – Identify spill source and assess hazard

- Ensure safety of all people in the area.
- Check for fire and explosion risk:
    - Extinguish all ignition sources in the area
- If unsafe, raise alarm and close off affected area

Priority 2 – Stop flow of spill

- Stop flow at source of spill
- Contain spill utilizing absorbent pads, drip pans, or other secondary containment berms to catch any slow or unexpected leaks.
- Attempt to limit the spread of the spill. Prevent movement using sorbent material and berms to form a barrier
- If the spill occurs on ice, attempts should be made to stop the spill from reaching ice-free ground.

Priority 3 – Notify direct Supervisor or Site Superintendent

- Provide as much information as possible about the source, material, amount, fire risk, injuries etc.

Priority 4 – Spill Containment

- For all spills, use absorbents to contain and soak up the fuel
- Prevent spread of fuel by using booms and berms
- Response operations should not be commenced in the affected area until it is safe.

Priority 5 – Spill Recovery and Cleanup

- Recover as much of the spill as possible using absorbent materials and/or digging up the affected area if applicable.
- Store any contaminated or recovered material in secondary containment
- Disposal should be by approved methods and facilities as per the Site Superintendent instructions.
- Ensure spill is recorded in Environmental Incident Log

Appendix C. NWT/NU Spill Report and Sabina Internal Spill Report

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR	REPORT TIME	☐ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER ____-_____
B	OCCURRENCE DATE: MONTH – DAY – YEAR	OCCURRENCE TIME		

C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION	REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS

F	RESPONSIBLE PARTY OR VESSEL NAME	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION	
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION	
H	PRODUCT SPILLED	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER
I	SPILL SOURCE	SPILL CAUSE	AREA OF CONTAMINATION IN SQUARE METRES
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR ENVIRONMENT
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS		

L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC | SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN | FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

SABINA INTERNAL SPILL REPORT FORM

This form is to be used for internal documentation of spills of any petroleum product, chemical, ethylene glycol (antifreeze), or other hazardous material. See recent Spill Contingency Plan for reporting thresholds and structure. Once complete file with the Operations Superintendent.

***Report Date and Time*:**	***Spill Date and Time*:** ☐ Spill occurred ☐ Spill observed
***Spill Location*:** ☐ Goose ☐ Other (e.g. Drill, Boulder Pond) ☐ George	***Describe Location*:**
***Coordinates (Lat/Long or UTM)*:**	

***Product(s) Spilled*:**	Jet fuel	Diesel (P50)	Gasoline	AvGas	Oil (type)	Antifreeze	Other (describe)
***Quantity (L or kg)*:**							

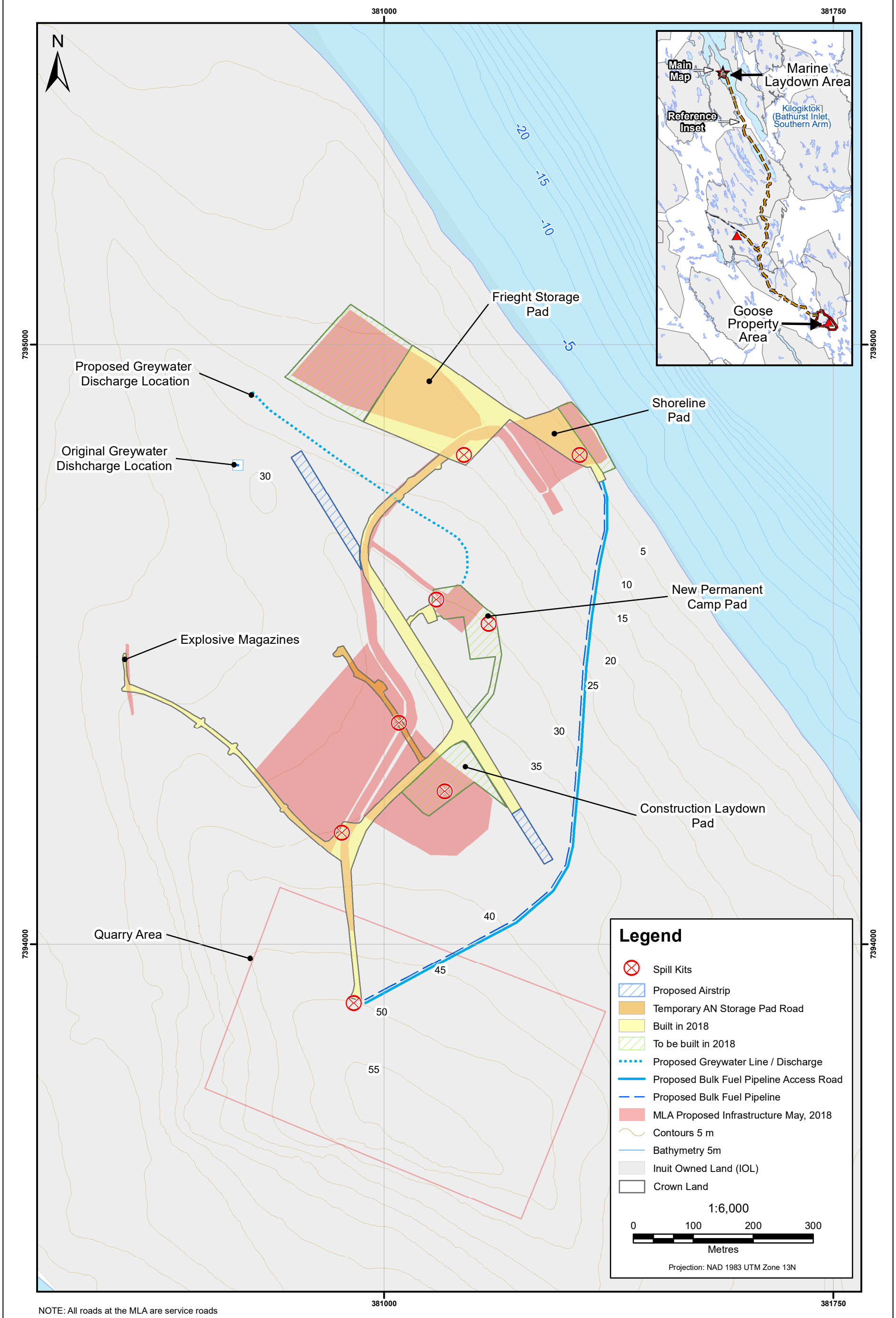
Personnel Involved:	☐ Sabina	☐ Contractor	☐ Visitor	☐ Other

***Cause of Spill*:**
***Containment/Cleanup Measures Taken*:**
***Factors Affecting Spill or Recovery (weather, snow, ground conditions, etc.)*:**
***Additional Action Required*:**
***Additional Comments*:**

	Name	***Employer***	***Signature***
***Reported by*:**			
***Reported to*:**			

Appendix D. Site Spill Kit Location Maps

GIS # BR_MLA_ENV_SPLKTS_June2018 W:\BackRiver\04_Exploration\BackRiverRegion\GIS_Products\ESRI_MXD\Water_Permitting\Spill Kits\BR_MLA_ENV_SPLKTS_June2018.mxd June 27 2018



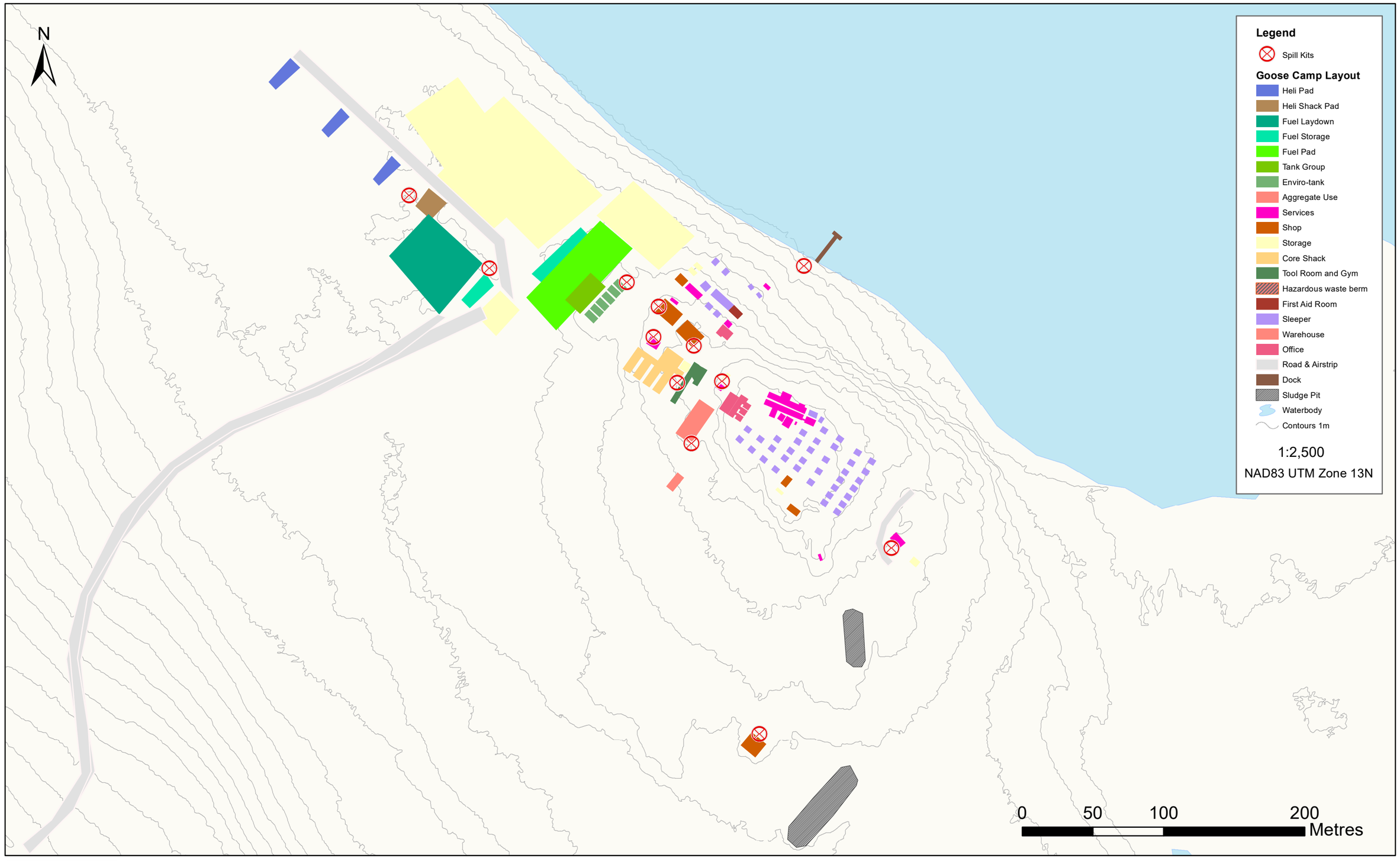
NOTE: All roads at the MLA are service roads

Sabina GOLD & SILVER CORP.

Marine Laydown Area
Potential Development Area and Layout
Spill Kit Locations June 2018

BR_GSE_ENV_SPLKTS_June2018

W:\BackRiver\04_Exploration\BackRiverRegion\GIS_Products\ESRI_MXD\Water_Permitting\Spill Kits\BR_GSE_ENV_SPLKTS_June2018.mxd



Sabina
GOLD & SILVER CORP.

Goose Exploration Camp
Spill Kit Locations June 2018

Appendix F Interim Closure and Reclamation Plan



BACK RIVER PROJECT
Interim Closure and Reclamation Plan

Type B Development Works Water Licence

April 2018

Version 2.0

EXECUTIVE SUMMARY

Interim Closure and Reclamation Plan

This Plan provides the closure and reclamation approach proposed by Sabina and an estimate of financial liability for the site as it pertains to the facilities and infrastructure related to Type B development activities of the Project to be carried out in advance of receipt of a Type A Water Licence. This Plan outlines the scope of the Development Works at both the Goose Property and the MLA. An outline and schedule of closure and reclamation activities is additionally provided.

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ᓇᐃᑐᒥᒃ ᐅᑯᐊᖅᓯᒪᓂᖅᓱᒃ ᓴᓗᓚᖅᓴᖅᑕᐅᓂᖅᓱᒃᓗ

ᐸᖅᓇᐅᑎ ᑐᓂᓯᔪᖅ ᐅᵇᑯᐊᖅᐸᑦᓕᐊᓂᖅᒥᒃ ᐊᓚᒪᓗ ᐅᑎᖅᑎᑎᓇᓂᖅᓗᑦ ᐊᑐᖅᑕᐅᓂᐊᖅᑐᑦ ᑐᓂᓴᕐᕕᑐᖅ ᕿᓇᐅᔭᕐᓂᖅᑕᐅᔪᑦ ᐊᑭᓕᐅᑎᖅᓇᐊᖅᓂᖅᓱᐅᔪᓂᖅ ᐃᓂᐅᔪᒪᑦ ᐱᔪᑎᖅᑎᒪᑦ ᐊᓂᔨᑎᖅᓚᖅᑐᓂᖅ ᐃᒪᓕᐅᔪᓂᖅᓱᐅᔪᓄᑦ ᐱᔪᑎᖅᖅᑐᓂᖅ Type B ᐱᓕᕐᓕᐊᓂᖅᓗᑦ ᖃᓄᐃᓕᓕᐅᖅᓂᐅᔪᓄᑦ ᐱᓕᓕᓇᖏᓂᐊᖅᑐᓂᖅ ᓯᕗᓂᐊᒍᑦ ᐱᔪᐅᖅᐸᑦ Type A ᐃᒪᖅᓗᑦ ᓕᐃᔪᖓᓯ. ᐸᖅᓇᐅᑎ ᑎᑎᕆᖅᓯᒪᔪᖅ ᖃᓄᐃᑲᑐᓂᖅᓴᓂᖅ ᐱᕕᓕᐊᓂᐅᔪᓂ ᐱᓕᓚᐊᑦ ᑕᒪᐃᓐᓂ ᔪᑦ ᐱᖅᑯᑎᑎᓴᐅᔪᑎᑦ ᐊᓚᒪᓗ ᓂᐅᕆᐃᓐᖏᓐᖓᑦ (MLA). ᑎᑎᕆᖅᓯᒪᔪᒥᒃ ᐊᓚᒪᓗ ᖃᓄᖅᑲᓇᔪᒥᒃ ᐅᑯᐊᖅᐸᑦᓕᐊᓂᖅᓱᒃᓗ ᐊᓚᒪᓗ ᐅᑎᖅᑎᑎᓇᕕᑦᓕᐊᓂᖅᓱᒃᓗ ᖃᓄᐃᓕᓕᐅᖅᓂᐅᔪᓄᑦ ᑕᐃᒪᐸᓄᓂᐅᔪᑦ.

Summary

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) within the West Kitikmeot region of southwestern Nunavut. It is situated approximately 400 km southwest of Cambridge Bay, 95 km southeast of the southern end of Bathurst Inlet, and 520 km northeast of Yellowknife, Northwest Territories. The Project is located predominantly within the Queen Maud Gulf Watershed (Nunavut Water Regulations, Schedule 4).

The Project is comprised of two main areas with interconnecting winter ice roads (WIR): Goose Property (Section 3.1, base Figure 2) and the Marine Laydown Area (MLA) (Section 3.2, base Figure 3) situated along the western shore of southern Bathurst Inlet. The majority of annual resupply will be completed using the MLA, and an approximately 160 km long WIR will interconnect these sites.

The Feasibility Study for the Project, completed in June 2015, identified the positive economic viability and potential of the Project. The mine plan reflects an estimated 10 year operating mine life based on currently identified ore reserves, with a total ore feed of 19.8 million tonnes to a single process plant at the Goose Property. The life of the Project, from Mobilization and Construction to Operations and Closure, and Post-Closure, is expected to be 27 years.

Mobilization and Construction activities could begin in Q1 of 2018 with the staging of materials at the MLA, followed by three years of construction of the Goose Property infrastructure. For the purpose of this application, the first year of production is termed “Year 1”. Production (Operations Phase) will carry on for 10 years followed by Closure activities (up to eight years). It should be noted that the Operations Phase may be extended beyond 10 years should additional mineral deposits become economical to be developed. Sabina will continue Post-Closure monitoring until closure objectives have been achieved.

The Project is subject to the regulatory requirements of the Nunavut Agreement and the N*unavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSRTA or Act), and as such is required to obtain a project certificate from the Nunavut Impact Review Board (NIRB) and a Type A Water Licence (Application) from the Nunavut Water Board (NWB) to allow for mine development and mining of the Project. Sabina recently completed public hearings related to the environmental review and assessment of the Project and the NIRB recommendation has been forwarded to the Minister. The Ministerial decision is pending.

The regulatory framework provided in the Nunavut Agreement, *Nunavut Project and Planning Assessment Act* (NuPPA) and NWNSRTA allows for interim, short-term approvals for water uses related to exploration or development work for a proposal under development impact review. The NWB is not restricted from issuing an interim, short-term period water license for development work related to the Project, provided the scope of works being considered for development works are being considered by the NIRB as part of the review of the Project.

Sabina is submitting this Type B Water Licence application and supporting documents (Application) for proposed development works, as well as supporting ongoing exploration and baseline data collection related to the Project. Sabina believes the scope of activities proposed for this Application are consistent with scope identified in the Project Proposal submitted to the NIRB for review. Sabina understands the Application can be processed as an interim, short-term approval consistent with Article 13.5.5 of the Agreement.

Construction scheduling and implementation for the Project is dependent upon, and restricted by, the seasonal sealift to support mobilization of supplies and equipment. By implementing a development permitting approach, Sabina and the Project could yield substantial scheduling gains. The securing of a Type B Water Licence would allow for development, construction, site preparation, and mobilization

work to begin potentially in Q1 of 2018, following issuance of the Project Certificate and while awaiting the Type A Water Licence. The alternative, which would involve Sabina waiting up to a year to receive a Type A Water Licence before starting any construction would have a significant impact on the overall project schedule and the economic feasibility of the Project.

Sabina has identified specific development activities that would be beneficial in achieving the overall project schedule. The proposed development works requested for consideration include the following:

GOOSE PROPERTY
Goose Exploration Camp Operation[(a)]
Ice Airstrip Construction and Operation[(a)]
Mobilize Fuel, Equipment, and Supplies[(a)]
Winter Ice Road Construction and Operation
Operate Airstrip Quarry[(a)]
Operate Umwelt Quarry
Locate Temporary Fuel Storage[(a)]
Construct All-weather Service Roads and Water Crossings
Construct Goose Plant Site and Fuel Storage Area Pad
Airstrip Extension
Rascal Stream Re-alignment or Fish Bearing Culverts
Relocate Explosives Storage Area
Water Intake Installation
MARINE LAYDOWN AREA
Ice Airstrip Construction and Operation
Mobilize Fuel, Equipment, and Supplies (by Air)
Upgrade Temporary Exploration Camp[(b)]
Operate MLA Quarry
Construct All-weather Service Roads, Laydown Areas, and Fuel Storage Area
Mobilize Additional Fuel, Equipment, and Supplies (by Vessels)
Install One Steel Bulk Fuel Tank
Water Intake/Discharge Installation

(a) activities authorized under 2BE-GOO1520
(b) activities authorized under 2BE-GEO1520

The overall goal of closure is to return the proposed mine site and affected areas to viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and with human activities. The overall closure goal is supported by the four closure principles of: physical stability, chemical stability, no long-term active care requirements, and compatibility with future land uses for each component of the Project.

In accordance with NWNSRTA, Sabina is required to furnish and maintain security with the Minister, in a form determined by the Regulations or satisfactory to the Minister. For the NWB to be able to issue a licence, Sabina must satisfy the Board that the company has the financial ability to adequately implement mitigation measures and apply any costs associated with closing or abandonment of the undertaking.

This document provides the closure and reclamation approach proposed by Sabina and an estimate of financial liability for the site as it pertains to the facilities and infrastructure related to Type B development activities of the Project to be carried out in advance of receipt of a Type A Water Licence.

BACK RIVER PROJECT
INTERIM CLOSURE AND RECLAMATION PLAN

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1. Introduction

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) within the West Kitikmeot region of southwestern Nunavut. It is situated approximately 400 km southwest of Cambridge Bay, 95 km southeast of the southern end of Bathurst Inlet, and 520 km northeast of Yellowknife, Northwest Territories. The Project is located predominantly within the Queen Maud Gulf Watershed (Nunavut Water Regulations, Schedule 4).

The Project is comprised of two main areas with interconnecting winter ice roads (WIR): Goose Property (Section 3.1, base Figure 2) and the Marine Laydown Area (MLA) (Section 3.2, base Figure 3) situated along the western shore of southern Bathurst Inlet. The majority of annual resupply will be completed using the MLA, and an approximately 160 km long WIR will interconnect these sites.

The MLA is located on Inuit Owned Land (IOL). The Goose Property is predominately located on IOL, except for the southern portion, which is located on Crown Land. A northern portion and a southern portion of the WIR connecting the MLA and the Goose Property are located on Crown Land.

The Project is 100 % owned by Sabina. All rights, title, interests, liabilities, and obligations for the Project rest with Sabina. In 2009, Sabina acquired the Project from Dundee Precious Metals for a total acquisition cost in the order of $29.3 million.

The Feasibility Study for the Project, completed in June 2015, identified the positive economic viability and potential of the Project. The mine plan reflects an estimated 10 year operating mine life based on currently identified ore reserves, with a total ore feed of 19.8 million tonnes (Mt) to a single Process Plant to be located at the Goose Property. The milling rate will be approximately 6,000 tonnes per day. The life of the Project, from Mobilization and Construction to Operations and Closure, and Post-Closure, is expected to be 27 years.

Mobilization and Construction activities could begin in Q1 of 2018 with the staging of materials at the MLA, followed by three years of construction of the Goose Property infrastructure. For the purpose of this application, the first year of production is termed “Year 1”. Production (Operations Phase) will carry on for 10 years followed by Closure activities (up to eight years). It should be noted that the Operations Phase may be extended beyond 10 years should additional mineral deposits become economical to be developed. Sabina will continue Post-Closure monitoring until closure objectives have been achieved.

The Project includes several mineral deposits at the Goose Property: Umwelt, Llama, Echo, and Goose Main. Ore will be mined using conventional open pit and underground methods and then trucked to the Process Plant. Waste rock will be stored in several designated waste rock storage areas (WRSAs) on the surface or backfilled in mined out workings. Tailings from the Process Plant will first be stored in a Tailings Storage Facility (TSF) located near the Process Plant and then backfilled in mined out open pits.

Fifty-nine (59) Mt of mining waste rock and 5.3 Mt of overburden are expected to be produced during the life of mine, for a total of 64.3 Mt of waste. Approximately 19.8 Mt of tailings will be produced.

The Project is subject to the regulatory requirements of the Nunavut Agreement and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSRTA or Act). As such, the Project is required to obtain a project certificate from the Nunavut Impact Review Board (NIRB) and a Type A Water Licence (Application) from the Nunavut Water Board (NWB) to allow for mine development and mining of the Project. Sabina recently completed public hearings related to the environmental review and assessment

of the Project and the NIRB recommendation has been forwarded to the Minister. The Ministerial decision is pending.

The regulatory framework provided in the Nunavut Agreement (Agreement), *Nunavut Project and Planning Assessment Act* (NuPPA) and NWNSRTA allows for interim, short-term approvals for water uses related to exploration or development work for a proposal under development impact review. The NWB is not restricted from issuing an interim, short-term period water license for development work related to the Project. Provided the scope of works being considered for development works are being considered by the NIRB as part of the review of the Project.

Sabina is submitting this Type B Water Licence application and supporting documents (Application) for proposed development works, as well as supporting ongoing exploration and baseline data collection related to the Project. Sabina believes the scope of activities proposed for this Application are consistent with scope identified in the Project Proposal submitted to the NIRB for review. Sabina understands the Application can be processed as an interim, short-term approval consistent with Article 13.5.5 of the Agreement.

Construction scheduling and implementation for the Project is dependent upon, and restricted by, the seasonal sealift to support mobilization of supplies and equipment. By implementing a development permitting approach, Sabina and the Project could yield substantial scheduling gains. The securing of a Type B Water Licence would allow for development, construction, site preparation, and mobilization work to potentially begin in Q1 of 2018, following of issuance of the Project Certificate and while awaiting the Type A Water Licence. The alternative, which would involve Sabina waiting up to a year to receive a Type A Water Licence before starting any construction would have a significant impact on the overall project schedule and the economic feasibility of the Project.

Sabina has identified specific development activities that would be beneficial in accelerating the overall project schedule. These facilities are listed in Section 3 and the closure and reclamation of these facilities along with an estimate of financial liability are provided in this document.

2. Regulatory Context

A detailed overview of the legislative and regulatory requirements are provided in Section 2 of the Main Application Supporting Document.

This Type B Water Licence Application has been prepared in accordance with specific legislative requirements outlined in the Nunavut Agreement, the NWNSRTA, the Nunavut Water Regulations, and where applicable the NuPPA. For a full listing of regulatory permits, authorization, or licenses for the Project development refer to Appendix F of the Main Application Supporting Document.

3. Scope of Development Works

Development works associated with the Sabina's Goose Property and the MLA are summarized below. Sabina believes the development work exceptions are appropriate as the activities:

- Facilitate the limited transport and storage of equipment and materials related to the Project, in recognition of the seasonal constraints imposed by the Arctic conditions. This includes the transport of fuel, equipment, and supplies, construction of WIRs and airstrips, establishment of laydown areas, all-weather services roads, and related use of existing or new quarry and borrow sources.

- Facilitate scientific research and ongoing baseline data collection within the defined project area to support where possible commitments made for the Project under Review.

- Will support continued exploration and additional sampling.

The scope of development works is provided in Section 3 of the Main Application Supporting Document. In summary, the following development works are proposed (base Figures 2 and 3):

3.1 GOOSE PROPERTY DEVELOPMENT WORKS

Activities and works already scoped and approved under the existing NWB Type B Water Licence 2BE-GOO1520 include:

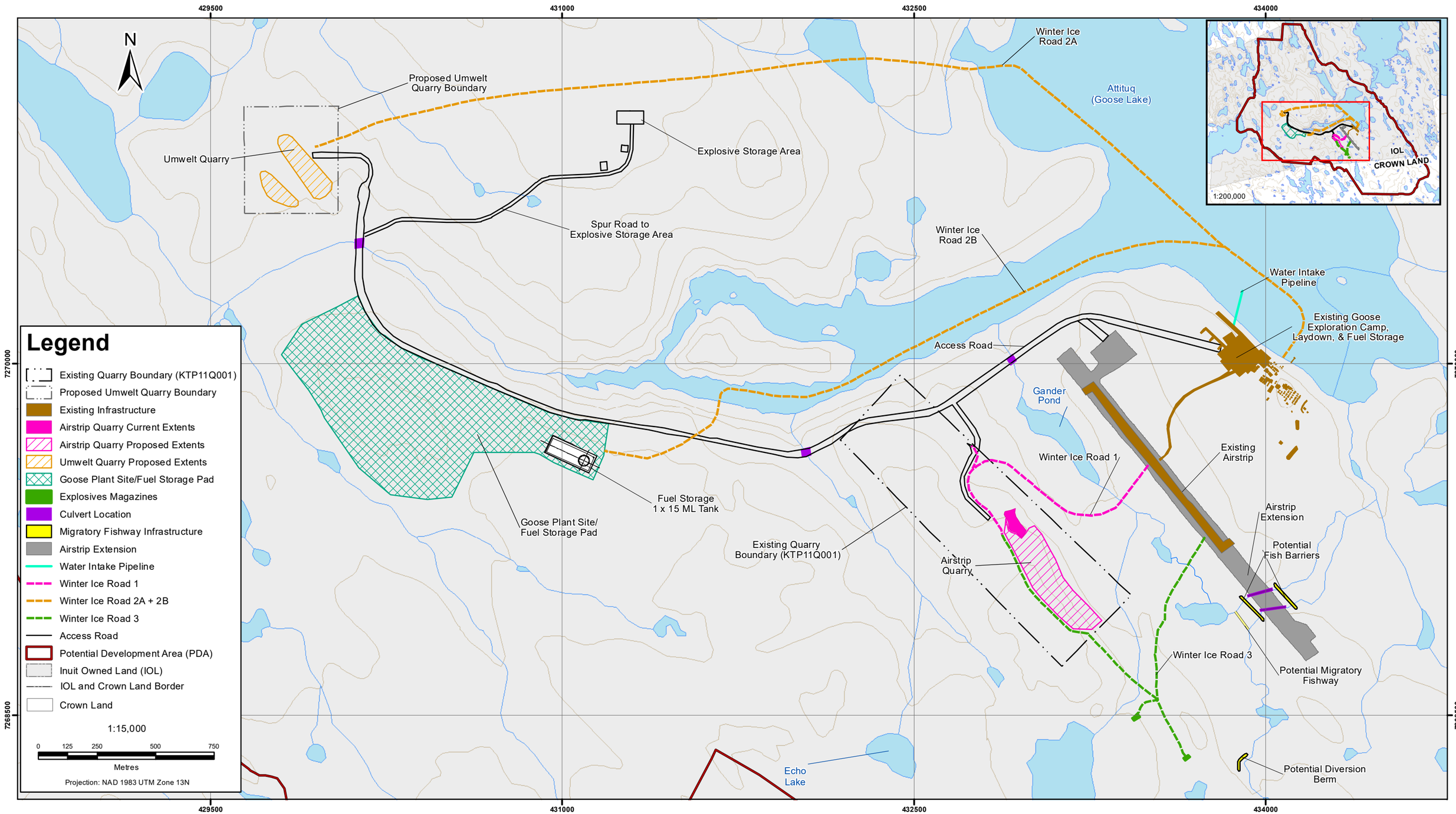
- Goose Exploration Camp and infrastructure operation;
- Ice airstrip construction and operation;
- Equipment, fuel, and supplies mobilization;
- Winter ice road construction and operation;
  - Goose Exploration Camp to Airstrip Quarry Winter Ice Road;
- Airstrip Quarry operation; and
- Temporary fuel cache storage.

These approved activities have been included within this application document to provide clarity on overall proposed activities; however, do not require additional authorization. For existing permits, authorizations, and approvals refer to Section 2.3.1 of the Main Application Supporting Document.

Proposed new development works being requested for consideration in this Application include:

- Winter ice road construction and operation;
  - Goose Exploration Camp to Umwelt Quarry Winter Ice Road;
  - Goose Exploration Camp to Explosives Storage Winter Ice Road;
- Umwelt Quarry operation and expansion of the Airstrip Quarry;
- All-weather service road construction and operation, including associated water crossings;
- Goose Plant Site and Fuel Storage Area Pad initial construction including the installation of one steel bulk fuel tank;

- Airstrip extension;
- Rascal stream re-alignment or fish bearing culverts;
- Explosives storage area relocation; and
- Water intake installation.

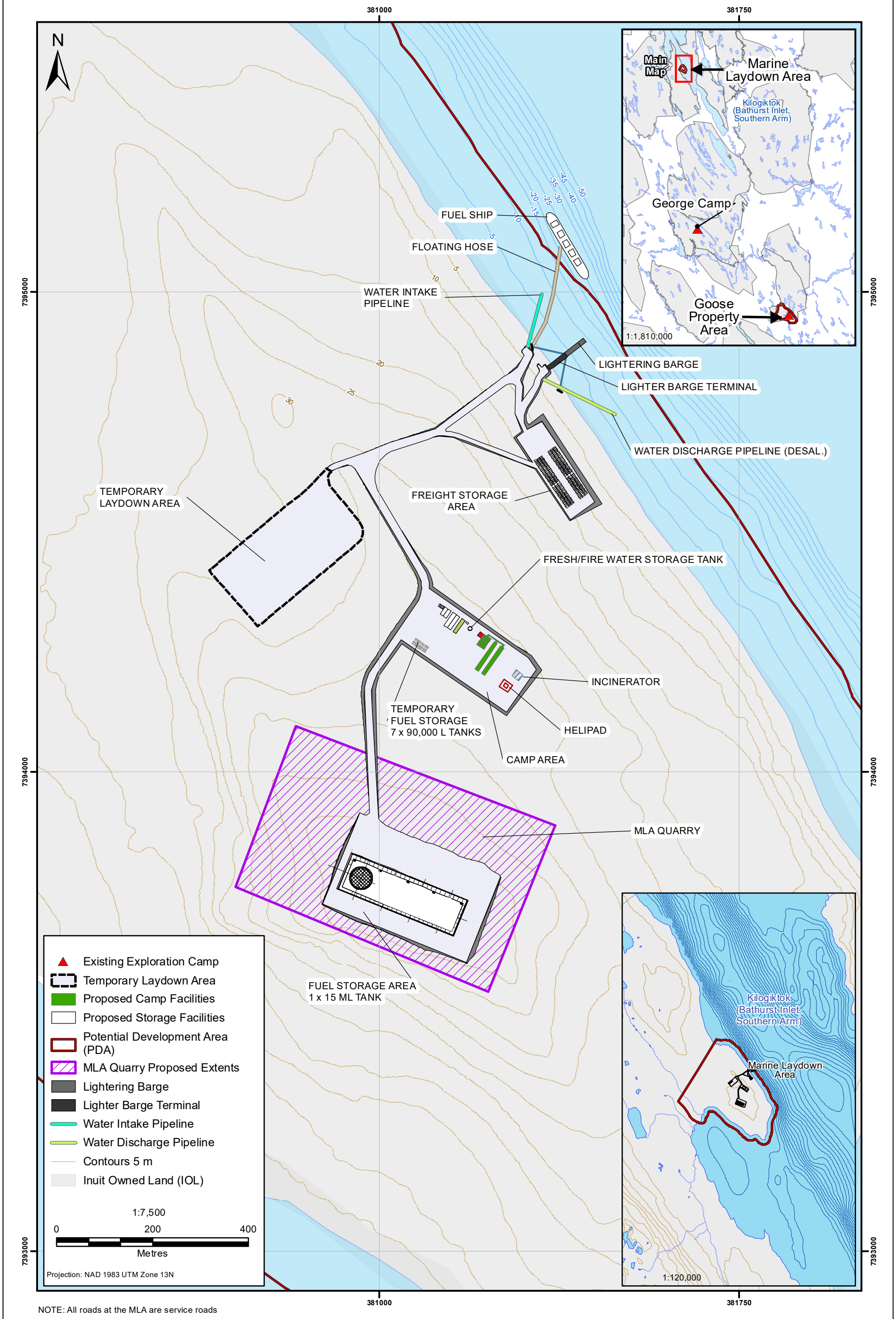


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Goose Property Area
Potential Development Area and Layout
Type B Water Licence

base Figure 2

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NOTE: All roads at the MLA are service roads

Sabina GOLD & SILVER CORP.

Marine Laydown Area
Potential Development Area and Layout
Type B Water Licence

base Figure 3

3.1.1 Winter Ice Roads

Winter ice roads, totaling approximately 9 km in length, will be required to connect and access the proposed quarries at the Goose Property. These WIRs will allow development works to commence in the winter season, reducing potential environmental effects by avoiding any potential overland rutting or gouging. Short land based portages may be developed to support WIRs development, Sabina will confirm all appropriate land use permits are in place prior to construction. For additional information related to environmental baseline and effects refer to Section 5 of the Main Application Supporting Document. Efforts will be made to limit distances developed by utilizing one WIR to access multiple locations, or by utilizing other infrastructure (i.e., the permanent airstrip) to shorten distances. The WIRs would be used to temporarily connect three key areas (base Figure 2):

1. Goose Exploration Camp to Airstrip Quarry (Winter Ice Road 1): This WIR will provide continued access to the existing quarry and source material needed for development works. Construction and operation of this WIR is currently a permitted activity under water licence 2BE-GOO1520, and all planned activities will be consistent with activities undertaken in previous years. No additional water usage is currently anticipated.
2. Goose Exploration Camp to Umwelt Quarry/Goose Plant Site (Winter Ice Road 2a/2b): This WIR will provide new access to Umwelt Quarry/Goose Plant Site and source material needed for development works.
3. Goose Exploration Camp (or other WIR) to Explosives Storage (Winter Ice Road 3).

Consistent with WIR construction under 2BE-GOO1520, all ice roads will be constructed using the Government of Northwest Territories (GNWT) published Northern Land Use Guidelines (GNWT 2015).

3.1.2 Quarries/Borrow Sources and Overburden

Two quarries have been identified for use at the Goose Property: the existing quarry next to the airstrip (Airstrip Quarry) incorporated within 2BE-GOO1520, and a new quarry located within the footprint of the future Umwelt open pit (base Figure 2). Up to 625,000 m^3 of rock will be required to support development works and this material will be extracted from one or both of these quarries. Sabina does not anticipate the total volume of rock extracted from one or both quarries however, to exceed 625,000 m^3.

Sabina currently holds a Quarry Permit Agreement (KTP11Q001) with the landowner, the Kitikmeot Inuit Association (KIA), for the existing Airstrip Quarry at the Goose Property. The coordinates of the existing and proposed quarries are presented in Table 3.1-1. An amendment will be sought from the KIA for the Goose Property's Airstrip Quarry Permit Agreement and a new agreement will be sought to develop a rock quarry at the Umwelt deposit.

Table 3.1-1. Summary of Existing and Proposed Quarries

Aggregate Source	Permit	Material	Approved Volume (m^3)	Maximum Requested Volume (m^3)[(a)]	Permit Area Boundaries
Airstrip Quarry (Existing Quarry)	KTP11Q001/ Type B Water Licence 2BE-GOO1520	Rock	125,000	625,000	See QMP
Umwelt Quarry	In application	Rock	0	625,000	See QMP

(a) Combined maximum volume from Airstrip Quarry and Umwelt Quarry not to exceed total volume of 625,000 m^3

Detailed geochemical characterization studies to assess the metal leaching/acid rock generation (ML/ARD) potential of quarry rock associated with the Goose Property was carried out; results can be found in the Geochemical Characterization Report (FEIS Volume 2, Appendix V2-7D). The testing program included acid-

base accounting (ABA) and trace element analyses on 40 samples from the Airstrip Quarry, and 16 samples from the Umwelt Quarry.

The Airstrip Quarry is mainly comprised of turbiditic meta-sedimentary rocks (greywacke and mudstone) with minor amounts of banded iron formation, large intrusive gabbro dykes, and smaller felsic to intermediate dykes. Results indicate that rock from the Airstrip Quarry has a variable potential for ARD. Based on these results, Sabina has committed to complete further testing within the existing quarry footprint to further delineate potentially acid generating (PAG) materials in advance of, or concurrent with, sourcing additional material from this quarry. Only non-potentially acid generating (NPAG) quarry rock will be used for construction. For additional information, refer to the Quarry Management Plan provided as a supplement document to the Application.

The location of the Umwelt Quarry was selected as it was the closest source of suitable material to the development works. Geochemical characterization indicates that the majority of upper greywacke samples representing the proposed quarry areas within the Umwelt pit are classified as either NPAG or low-sulphur material with a limited potential for ARD generation. Additionally, based on low solid phase arsenic concentration, ML is unlikely. Therefore, no special management measures are required at this location.

The existing Airstrip Quarry has minimal overburden and the same condition is expected in the expansion area. Any overburden generated and not used by the Project will be placed in stable stockpiles either above the highwall or along the toe of the quarry. To develop the Umwelt Quarry, it will be necessary to strip and stockpile the overburden for potential use in Project closure efforts. Though the ground is relatively flat across the top of the Umwelt Quarry, the stockpile will be positioned on the up gradient side of the quarry so that the finished quarry can serve to collect runoff from the stockpile. Since the overburden may be frozen, it may become necessary to blast it to facilitate its removal. Some slumping of the overburden pile may be expected as it thaws and as water is released from the soil. The overburden stockpile will likely be constructed in a windrow fashion to an approximate maximum height of 6 m and sloping outward. This configuration could be modified based on observations in the field.

3.1.3 All-weather Service Road and Associated Water Crossings

Sabina proposes to construct all-weather service roads for the development works. This road alignment, totaling approximately 7.4 km in length, is required to connect the existing Airstrip Quarry, the Explosives Storage Area spur road, the new Umwelt Quarry, the Goose Plant Site pad, and the existing Goose Exploration Camp.

The service roads will be constructed with run-of-quarry rock placed directly onto the tundra to preserve the permafrost. A layer of graded surfacing material will be placed to provide a protective trafficking layer. Construction materials will consist of geochemically and geotechnically suitable rock sourced from the existing quarry and/or Umwelt Quarry.

Stream flow across the service roads will be conveyed using appropriately sized culverts. The service roads will have a travelling surface up to 8 m width for development works. The service roads will have a normal maximum grade of 6% with up to 10% for short lengths. The major culverts will be designed to convey flows for 1-in-100-year event.

3.1.4 Goose Plant Site and Fuel Storage Area Pad Initial Construction

Once service roads to the Goose Plant Site area are established, construction material will be sourced by cutting bedrock material to create a suitable area for the Goose Plant Site pad and Fuel Storage Area pad; it is estimated that up to 300,000 m^3 of rock fill material will be required.

Ground conditions for design and engineering of Goose Plant Site infrastructure has been informed by four geotechnical investigations from 2010 to 2015, which have included: test pits, drill holes, thermistor installations, and a variety of laboratory and in-situ testing. Geotechnical design is also supported by ERM Rescan's 2014 Cumulative Permafrost Baseline Data Report which includes observations on active layer freeze-thaw cycle and active layer depth from 2007 to 2014. Refer to the Site-Wide Geotechnical Properties Report (FEIS Volume 2, Appendix V2-7C) for more detail.

It will be necessary to strip and stockpile the overburden to create the pad areas. The overburden material is expected to be used later for the Project closure efforts. Overburden materials at the Goose Property generally consist of poorly sorted till material (glacial sediments) that appear highly weathered and contain mostly refractory minerals. Though the ground is relatively flat across the deposit, the stockpile will be positioned on the up gradient side of the pad so that the finished pad can serve to collect runoff from the stockpile. Since the overburden may be frozen and therefore blasted during removal, some slumping is expected as water is released from the soil. The overburden stockpile will likely be constructed in a windrow fashion to an approximate maximum height of 6 m and sloping outward. This configuration could be modified based on observations in the field.

One 15 ML field erected fuel tank will be constructed at the Goose Fuel Storage Area Pad. Construction of the fuel tank and the fuel storage area and transfer facilities is proposed to occur under this Application. The Goose Fuel Storage Area will be constructed in conformance with the Canadian Council of Ministers of the Environment (CCME) Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products (CCME 2003), and the *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations* (2008). Project fuel storage facilities will be designed to have bermed spill containment with capacity equal to the volume of the largest tank plus 10% of the volume of the remaining tanks, or 110% volume of the largest tank, whichever is greater. The fuel tank storage areas embankments (or bund) will be lined with HDPE for spill containment. The fuel storage areas will be provided with standard instrumentation and controls to monitor and safely manage the inventory in the tanks. For additional information related to the design of the fuel storage facilities, refer to the Fuel Management Plan. Sabina is committed to provide detailed designs for construction of the 15 ML fuel storage and fuel transfer facilities at the Goose Property to the NWB at least 60 days prior to construction.

3.1.5 Airstrip Extension

The Goose Property currently has a 914-m all-weather gravel airstrip that can be used year-round, and during the latter part of the winter, January to May, a 2,000-m (6,564 ft.) ice airstrip can be established on Goose Lake. The current airstrip will be extended to allow for servicing passenger and cargo aircraft in support of ongoing year-round exploration and development works. This airstrip will serve as the main air access to the Goose Property throughout the life of the Project. The all-weather airstrip will be designed to Transport Canada standard TP 312 Aerodrome Standards and Recommended Practices (2015). The airstrip will be extended to be approximately 1,524 m long and 45 m wide.

The airstrip extension will require installation of two culverts (base Figure 2). Preliminary typical cross-sections of watercourse crossings are provided in the Road Management Plan. For water quality monitoring information refer to the Environmental Monitoring and Protection Plan (EMPP).

3.1.6 Rascal Stream Re-alignment or Fish Bearing Culverts

Rascal Stream East, one of the two Rascal Lake outflows (Rascal Stream East and Rascal Stream West), will intersect the extended airstrip footprint. Both streams provide spawning and rearing habitat for Arctic Grayling from Goose Lake. Presently there are two options to mitigate potential effects to fish habitat on the stream; these options are designed to maintain the migration of Arctic Grayling from

Goose Lake (through Rascal Stream East and Rascal Stream West) to natural spawning and rearing habitat located in upper Rascal Stream East, south of the planned airstrip. This will be achieved by constructing two culverts to convey flows and provide passage for fish underneath the airstrip extension, or by realigning the natural channel of Rascal Stream East and diverting the water currently flowing from Rascal Lake directly to Goose Lake, to flow through Gosling Pond 1 and 2, and then downstream to Gander Pond and Goose Lake (base Figure 2). The latter option is described in Addendum Appendix V6-6F of the FEIS.

The preferred mitigation option for this application is to maintain fish habitat and existing downstream flows of Rascal Stream East prior to the development and operation of the Goose Main Pit. Although the re-alignment and diversion of Rascal Stream East may be required during later stages of construction and operation, it is recommended that those measures are postponed to minimize downstream effects to Arctic Grayling habitat in Rascal Creek East (including Goose Inflow South).

As part of Fisheries and Oceans Canada's Request for Review process, site-specific engineering design drawings with detailed construction, mitigation and monitoring plans for the culvert crossing will be provided to Fisheries and Oceans Canada prior to construction to determine if regulatory approvals under section 35(2) of the Fisheries Act are required for the crossing. The monitoring plan will include details on methods for evaluating the effectiveness of the culverts in providing fish passage, including appropriate measurement indicators such as water depths, water velocities, and migration success. During the regulatory phase, Sabina will continue to engage Fisheries and Oceans Canada, the Kitikmeot Inuit Association, and other interested parties to determine the optimal long-term solution on the design, construction, and operation of fish passage mitigation, and fully intends to undertake the appropriate Fisheries and Oceans Canada review as required and comply with NIRB Term and Condition #26 (NIRB 2017). This condition requires Sabina to engage Fisheries and Oceans Canada, the Kitikmeot Inuit Association, and other interested parties during the regulatory phase on the design, construction, and operation of measures to maintain fish passage of Arctic Grayling from Goose Lake to spawning and rearing habitat located in upper Rascal Stream East, south of the planned airstrip.

3.1.7 Explosives Storage Area Relocation

Sabina proposes to relocate the currently approved explosive storage area identified in 2BE-GOO1520 to the Explosives Storage Area spur road (see base Figure 2). The design of all explosive storage facilities will meet government regulations and will be located according to required separation distances as regulated by the Explosives Regulatory Division of NRCan. For additional information, see Section 2.5.3 of the Main Application Supporting Document.

3.1.8 Water Intake Installation

In recognition of the seasonal constraints imposed by Arctic conditions and the current construction and permitting schedule, Sabina needs to mobilize and install the water intake for the Goose Property under this Application. All water intakes and discharges will be designed in accordance with DFO guidelines, including adequately screening to prevent impingement and entrainment of fish.

The structures will consist of 8" diameter PVC pipe installed on a rockfill base within the lake to keep the pipe above the lake bottom. Rock armouring will be placed along the shore to protect the pipeline from ice scour. See Figure 3.1-1 of the Main Application Supporting Document for a typical plan and section of the fresh water intake pipeline.

Construction of the Project intakes will involve in-water works. To limit disruption to aquatic resources, the following practices will be implemented:

- Only NPAG armour rock that is free of sediment will be placed in the water during construction to minimize acid generation and turbidity;
- Work will be isolated using silt curtains;
- Work will be carried out during calm water periods to control any turbidity effects due to the re-suspension of sediment; and
- Total suspended solids (TSS) and turbidity levels will be monitored throughout construction and work will be delayed if TSS levels and turbidity become too high.

In-water blasting is not planned for the construction of the Project water intakes.

3.2 MLA DEVELOPMENT WORKS

Activities and works at the MLA already scoped and approved under the existing NWB Type B Water Licence 2BE-GEO1520 include:

- Temporary Exploration Camp and infrastructure operation;
- Equipment, fuel, and supplies mobilization via cat-train; and
- Temporary fuel cache storage.

These approved activities have been included within this application document to provide clarity on overall proposed activities; however, they do not require additional authorization. For existing permits, authorizations, and approvals refer to Section 2.3.1 of the Main Application Supporting Document.

Proposed new development works at the MLA being requested for consideration in this Application include:

- Ice airstrip construction and operation;
- Equipment, fuel, and supplies mobilization (by air);
- Upgrade Temporary Exploration Camp;
- MLA Quarry operation;
- All-weather service road, laydown area, and bulk fuel storage area construction and operation;
- Additional equipment, fuel, and supplies mobilization (by vessels);
- Install one steel bulk fuel tank; and
- Water intake/discharge installation.

3.2.1 Ice Airstrip

The construction and operation of an ice airstrip on southern Bathurst Inlet will be required to supply the development works at the MLA. The MLA ice airstrip will be located as close to the MLA as possible, but the final location will depend on ice conditions and possible seal pup lairs. Consistent with ongoing ice airstrip construction and operation experience at Sabina's Goose and George Properties, it is anticipated that only a limited amount of water will be needed for ice airstrip construction at the MLA.

Although it is Sabina's understanding that the marine environment is outside the jurisdiction of the NWB, Sabina intends to utilize equivalent environmental protection measures which are in place for all on ice works at the Goose and George Properties. Water intakes, if required, will be equipped with screens to prevent the entrainment or impingement of fish in accordance with DFO Measures to Avoid Causing Harm

to Fish and Fish Habitat (DFO 2013). If the construction commences in the seal pupping season, the procedures described within the Wildlife Mitigation and Management Plan will be adhered to (Section 14.2 of the WMMP; Version 7, submitted with FEIS Addendum February 2017).

Equipment required for the construction of the ice airstrip will likely be mobilized to the MLA via cat train from Goose Property. Cat train operations are currently permitted under KIA LUP KTL304F049 and INAC LUPs N2010F0017 and N2011F0029, and all planned activities will be consistent with activities undertaken in previous years. Equipment may also be initially mobilized to the MLA by air equipped to land with skids on the unprepared marine ice.

3.2.2 Fuel, Equipment, and Supplies Mobilization

To commence development work at the MLA, fuel, equipment, and supplies will be brought to the MLA via the ice airstrip and by shipping using up to five vessels.

The equipment, materials, and fuel will be offloaded and initially stored at a temporary laydown area at the MLA prior to construction of the all-weather laydown area (base Figure 3). The Fuel will be initially mobilized to the MLA in nine approximately 70,000 L double walled fuel tanks. These tanks will be installed within tertiary Arctic-grade Insta-berms, and may be refilled throughout the development works. This temporary storage of fuel is required as permanent storage tanks are under construction. As built drawings will be provided within 90 days following installation.

A crusher, as well as supporting equipment, will be mobilized to allow for the initial development of all-weather service roads, laydown areas, and bulk fuel storage areas prior to the first sealift. A more detailed list of material and equipment can be found in a Table 3.2-1.

Table 3.2-1: Air Mobilization Inventory

Equipment / Material	Quantity
40 Person Soft Walled Camp	1
Camp Genset – 125kw	2
70,000 Fuel Tanks	9
Fuel Berms (80,000 L capacity)	9
Diesel Fuel	800,000 L
Incinerator	1
Mobile Crusher	1
Soft Walled Shop/Warehouse	1
Explosive Magazine – 20ft	3
Excavator	1
Haul Truck	2
Dozer – Cat D6T	1
Grader – Cat 140H	1
Air Track Drill	1
Compactor	1
Geomembrane Liner for Bulk Fuel Containment	1
Swamp Mats (if Required)	75

During the open water season, up to five vessels will be utilized to bring additional supplies, equipment, and fuel to the MLA for development work. Sabina will limit their shipping period to the open water season and will not ship within the Nunavut Settlement Area after October 15 (except under unforeseen and exceptional events including consideration for vessel safety). All vessels utilized will be appropriate as defined by Transport Canada's Zone/Date System. Each vessel will be appropriately sized and will utilize lightering barges to bring the material from the vessel to the barge landing location.

An initial sealift will mobilize additional fuel to be stored in the already positioned nine 70,000 L fuel tanks mobilized via air, as well as steel for one 15 ML fuel tank. Additional supplies and equipment required for development works (i.e., MLA camp maintenance and quarry operations) will also be mobilized. Except for large equipment and fuel, materials arriving at the MLA will generally be housed in sea containers. If the all-weather service road to the MLA barge landing area is not constructed prior to vessel arrival, the MLA will be accessed using swamp mats provisionally placed directly onto the tundra to preserve the permafrost and protect the tundra from rutting and gouging. Once the equipment is stored on the all-weather laydown area, the swamp mats along the access corridor will be removed and stored for future use, or transported offsite with the outgoing barges.

After the initial sealift, additional vessels (up to 5 total) will arrive at the MLA between late August and early October carrying fuel and materials required for ongoing development work. Limited equipment and supplies required for future Project activities, such as the first WIR construction and construction of the Goose Property, will also be mobilized. The mobilization of this equipment and supplies is included in this Type B Water Licence Application; however, Sabina intends for the activities associated with this equipment to be completed under the future Type A Water Licence.

A more detailed list of materials to be mobilized to the MLA via the open water sealift can be found in Table 3.2-2.

Table 3.2-2: Additional Sealift Vessel Inventory

Equipment / Material	Quantity
Diesel Fuel	~2,520,000 L
Camp Modules	15
Steel for 15 ML Steel Tank	1
Dozer – Cat D6T	1
Grader – Cat 140H	1
Air Track Drill	1
Compactor	1
Articulated Hauler	1
Excavator	1
Caterpillar Loader 966	1
Packer	1
Crew cab truck	1
Desalination Plant	1
Swamp Mats (8'x14')	550

3.2.3 Upgrade Temporary Exploration Camp

Sabina is currently authorized and operates a temporary exploration camp at the MLA, in accordance with NWB Water Licence 2BE-GEO1520. One of the first priorities of development works at the MLA will be to upgrade this existing temporary camp and its associated services and utilities. A soft walled camp with a capacity for about 40 persons will be established. The MLA camp will continue to employ Pacto or incinerating toilets, and Pacto-waste. Acceptable food waste, paper waste and untreated wood products will continue to be disposed of in an incinerator. All greywater will continue to be discharged at a distance of at least 31 m above the ordinary high water mark of any waterbody, at a location where direct flow into a waterbody is not possible. These measures for management of waste are consistent with those authorized under Sabina's current water licence 2BE-GEO1520. No additional water usage or waste management is requested for camp services under 2BE-GEO1520 (Part C, Item 1).

3.2.4 Quarries/Borrow Sources and Overburden

Quarry operations (cut and fill) at the MLA will be completed by cutting bedrock material in the same area as the MLA Bulk Fuel Storage Area. It is estimated that up to 400,000 m^3 of aggregate sourced from the cut/fill balance will be required for development work, which is referred to as the MLA Quarry (base Figure 3). The extracted material will be used to build the all-weather service roads, laydown areas, and bulk fuel storage area.

Cut and fill operations will use explosives and the design, shape, and size of the blasts will be planned with safety and potential environmental effects being the most important consideration. Prior to each blast, all personnel and equipment will be moved to a safe distance and a check for wildlife will be completed. The blasts will not be initiated until all setback requirements are met. For additional information refer to the Quarry Management Plan provided as a supplement document to the Application.

Preliminary geochemical characterization has been completed on surface outcrop samples and sandy gravel representing quarry material that will be excavated during initial development of the MLA Quarry. These samples were described as weathered quartzite conglomerate, quartz arenite/quartzite (sandstone) and sandy gravel. The test results showed that the materials have a negligible potential for ML/ARD. Sabina intends to complete additional sampling and testing in advance of, or concurrent with, development to characterize materials from greater depths. Only geochemically appropriate material will be used as construction material.

To develop the MLA Quarry, it will be necessary to strip and stockpile the overburden for potential use for future Project closure efforts. Though the ground is relatively flat across the top of the MLA Quarry, the stockpile will be positioned on the up gradient side of the quarry or beside the quarry so that the finished quarry can serve to collect runoff from the stockpile. Since the overburden may be frozen, and therefore blasted during removal, some slumping is expected as water is released from the soil. The overburden stockpile will likely be constructed in a windrow fashion to an approximate maximum height of 6 m and sloping outward. This configuration could be modified based on observations in the field.

3.2.5 All-weather Service Roads, Laydown Areas, and Bulk Fuel Storage Area

The development works require the construction of approximately 1 km of various all-weather service roads, laydown areas, as well as the construction of one of the bulk fuel containment areas (Base Figure 3). Sabina intends to utilize, wherever possible, the same footprint for the development works as the full-scale MLA site layout as presented in the FEIS. Pending the outcome of a planned 2017 geotechnical program at the MLA (which is occurring post Type B application submission) and completion of Basic Engineering work, the MLA layout may be further enhanced. Although the layout may alter due to construction limitations or efficiencies, the activities at the MLA as presented will not change. Should

significant alterations be required to the proposed MLA layout, Sabina will provide the portions of the revised layout and any other relevant enhancements, to the NWB 60 days prior to construction.

The service roads will be constructed with run-of-quarry rock placed directly onto the tundra to preserve the permafrost. A layer of graded surfacing material will be placed to provide a protective trafficking layer. The service roads will have a travelling surface up to 8 m wide for site preparation. The service roads will have a normal maximum grade of 6%, with up to 10% for short lengths.

There are no streamflow interactions and therefore no proposed water crossings at the MLA. Sabina will require construction of an all-weather service road within 31 m of the ordinary high water mark of Bathurst Inlet to facilitate access to the barge landing area. Sediment and erosion control measures shall be implemented prior to and maintained during the construction and operation where necessary to prevent entry of sediment into marine water.

One 15 ML field erected fuel tank will be constructed at the MLA. Construction of the fuel tank and the fuel storage area and transfer facilities is proposed to occur under this Application. The MLA Fuel Storage Area will be constructed in conformance with the CCME Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products (CCME 2003), and the *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations* (2008). The MLA fuel storage facilities will be designed as described in Section 3.1.4. Sabina is committed to provide detailed designs for construction of the 15 ML fuel storage and fuel transfer facilities at the MLA to the NWB at least 60 days prior to construction.

3.2.6 Water Intake/Discharge Installation

In recognition of the seasonal constraints imposed by Arctic conditions and the current construction and permitting schedule, Sabina needs to mobilize and install the desalination plant intake/discharge for the MLA under this Application. All water intakes and discharges will be designed in accordance with DFO guidelines, including adequately screening to prevent impingement and entrainment of fish.

An approximate 4” diameter intake will be placed at a depth of 5 m in Bathurst Inlet at the MLA location (base Figure 3). An approximate 4” diameter discharge will also be placed at a depth of 5m and this will be equipped with a diffuser about 10m long. Sabina is committed to provide detailed designs for construction of the intake and discharge to the NWB at least 60 days prior to construction.

Construction of the intake and the discharge will involve in-water works. See Section 3.1.8 for details on the proposed practices to limit disruption to aquatic resources.

4. Closure and Reclamation Approach

Sabina estimates that development work could be initiated as early Q1 2018 subject to NWB approval of the Type B Application for development works and issuance of the Project Certificate.

Sabina acknowledges that the NWB may require the company to furnish and maintain security with the Minister, in a form determined by the Regulations or satisfactory to the Minister. As such, Sabina has provided this Closure and Reclamation Approach and Security Estimate (the Plan). The Plan includes an estimate of financial liability for development works and site preparation (see Section 7); however, Sabina would propose that the NWB defer full consideration of security of project liability to the Type A Water Licence, projected to be submitted to the NWB in September 2017.

In accordance with the Nunavut Mine Site Reclamation Policy, Sabina's financial security cost estimate for the development works requested in the Application for a Type B Water Licence has been developed assuming third party contractor rates, on the presumption that Sabina would be somehow unable to fulfill its closure and reclamation obligations, and that the government would be required to take over reclamation of the works.

The decision to implement the Type B closure and reclamation approach does not mean Sabina would abandon its current work program for which it holds valid authorizations, licenses, and permits. Therefore, Sabina proposes to defer security of the development components to the Type A Water Licence.

Should the development activities require the implementation of the reclamation and closure plans as outlined in Section 5 in advance of receipt of a Type A Water Licence, then the development works remediation and closure would be undertaken at the same time as current approvals for the Goose Property and MLA (refer to Section 2.3 of the Main Application Supporting Document for the Type B Application).

The closure and reclamation activities associated with the proposed Type B Water Licence development work will follow applicable KIA and federal/territorial guidelines and policies.

5. Closure and Reclamation Activities

Closure and reclamation of proposed development works described in Section 3 will include:

- All surface structures, machinery, and equipment will be disposed at an off-site landfill when they are no longer needed and after any hazardous material has been removed.
- The water intakes and discharge systems will be decommissioned when they are no longer needed and after any hazardous material has been removed. Pipelines will be cut above water level, the sections of the pipelines located below the water level will be capped and left in place. The pumps and pipelines located above water level will be dismantled and disposed at an off-site landfill.
- Most of the mobile equipment will be disposed once the closure stage is complete. A small subset of equipment will be retained on-site for the Post-Closure Phase.
- Sabina will consider transferring the surface structures, machinery, and equipment to a third party, should there be such interest.
- Fluid hydrocarbons drained from equipment will be burned in the camps' incinerators where approved or shipped off-site to be disposed at a licensed facility.
- Any unused petroleum products will be burned in the camps' incinerators where approved. Unused chemicals will be sold, returned to suppliers or disposed by a licensed handler.
- All hazardous wastes will be removed from the site and transported to a licenced facility for disposal. Hazardous waste at Goose will be hauled to the MLA and then backhauled by sealift during the open water season to authorized waste disposal areas in southern Canada (as per Sabina's Hazardous Waste Management Plan). All waste material will be handled, stored, and transported in accordance with the Canadian and Territorial waste regulations.
- Fuel not required during the closure and reclamation activities will be sold, returned to suppliers, or incinerated in the camps' incinerators.
- Fuel tanks will be steam cleaned, cut-up, and shipped off-site for use as scrap. The rinse water will be treated before disposal.
- An assessment will be carried out to identify areas where soils may be contaminated by hydrocarbons; contaminated soils will be excavated and placed in containers to be shipped off-site for remediation and disposal.
- All developed areas at each of the Project sites will be re-graded and contoured to remove uneven ground for public and wildlife safety, to reduce the potential for erosion, and to blend with the surrounding landscape. Cover materials may be required for erosion and dust control. It is anticipated that a succession of native plant species will naturally re-vegetate the surface over time.
- Air access to the MLA during Post-Closure monitoring will use float planes during summer or ice airstrip during winter.
- Air access to Goose Camp during Post-Closure monitoring will use will use the airstrip while it is available. After that, access will be by planes landing on Goose Lake (using floats during summer or skis or ice airstrip during winter).

- The re-aligned section of the Rascal Stream will be restored to its natural drainage and the original fish passage will also be restored when the airstrip is no longer required. This will involve decommissioning of the migratory fishway and fish barriers, and breaching of the diversion berm.
- All-weather service roads and airstrip:
  - Once the all-weather service roads and airstrip are no longer required for Closure and Post-Closure activities, the culverts will be removed and the natural drainage will be restored.
  - The remaining all-weather service road sections (with no culverts) will be scarified, but will otherwise remain intact to ensure preservation of permafrost.
  - The shortened airstrip will remain functional with a gravel surface for use during post-closure monitoring. Final closure of the airstrip will be similar to the all-weather roads.
  - It is anticipated that a succession of native plant species will naturally revegetate the surface over time.
- Quarries/Borrow Sources and Overburden
  - All mobile and stationary equipment will be removed.
  - The overall reclamation objective for the quarry/borrow areas is to return the site to a condition that blends in with the existing topography and surrounding landscape. It is anticipated that a succession of native plant species will naturally revegetate the surface over time.
  - In the case of the Airstrip Quarry and MLA Quarry, no extraction will occur below water level and the area will be contoured to drain positively, so there will be no residual pond after the quarries are closed. The water quality of the runoff will be monitored.
  - Operation of the Umwelt Quarry will result in the formation of two closed depressions that will accumulate water over time. A wall of boulders will be constructed around the quarry to prevent inadvertent access to the flooded voids and warning signs will be posted. One small spillway will be excavated for each of the depressions to control the location and elevation of water discharge. The discharge water quality will be monitored.

Development of monitoring and maintenance programs will be an iterative process in consultation with communities and regulators as the Project advances. Monitoring and maintenance of the reclaimed facilities will be carried out during development, Operations, and into Closure. Periodic inspections will be performed to visually assess the reclaimed areas.

Groundwater will be only sampled if site-specific conditions dictate during the Closure Phase. Surface water quality monitoring will be undertaken on the drainage from the MLA Quarry and the Goose Airstrip Quarry and Umwelt Quarry. This monitoring will be discontinued after three years if the results are satisfactory.

5.1 POST-CLOSURE MONITORING, MAINTENANCE, AND REPORTING

Monitoring programs will be initiated during Construction and Operations to provide additional baseline information on which to base the FCRP document. The adaptive management plans to be used in Closure and Post-Closure will follow the actions completed during Operations, and will be co-ordinated with the operational monitoring programs (e.g., Aquatic Effects Monitoring Plan [AEMP], Environmental Management and Protection Plan [EMPP]) to set appropriate trigger levels, and mitigation plans and actions.

Monitoring and maintenance programs that are implemented during the Closure and Post-Closure phases of the mine life will use the data collected during operational monitoring to assess the performance of the reclamation and closure procedures, and to identify long-term maintenance requirements, if any. The data collected during Post-Closure monitoring will allow the procedures and activities to be adjusted or modified as necessary to confirm ongoing environmental protection.

Closure and Post-Closure Strategies

Development of monitoring and maintenance programs is an iterative process in consultation with communities and regulators as the Project advances. The Closure and Post-Closure monitoring and maintenance programs will be extensions of efforts undertaken during the Operations phase and would reflect the success of the management of the site during Operations to limit contamination. The actual conditions or impact from the Operations within the mine footprint would be understood at Closure and this information would be used to modify monitoring plans moving to Closure and Post-Closure.

Closure and post-closure monitoring and maintenance will be carried out at a reduced frequency depending on the results of the monitoring and the measures of success selected for closure.

Reporting

The preparation of the following reports is required by the MVLWB/AANDC (2013) guidelines for closure and reclamation of all components of mine sites:

- **Annual Closure and Reclamation Plan Progress Report:** The general purpose of these annual reports is to provide an opportunity for all parties to track, modify, and report on reclamation. The annual review of research results also provides an opportunity to identify missing research tasks, which allows the research plans to continually evolve. The progress reports keep all parties informed about closure planning and allow NWB to confirm that the proponent has remained on schedule. Any proposed changes to the ICRP with supporting rationale should be presented in these reports for NWB approval.
- **Reclamation Completion Report:** The general purpose of the reclamation completion report is to provide details, including figures, of the actual reclamation work completed, and an explanation of any work that deviated from the original or approved ICRP. The report should also provide a preliminary assessment on whether appropriate closure objectives and criteria have been achieved. With each reclamation completion report, there may be an opportunity to revise the financial security estimate depending on the stage of the operation and the current ICRP.
- **Performance Assessment Report:** A performance assessment report is prepared at the completion of the reclamation work and following submission of the reclamation completion report. The general purpose of the performance assessment report is to provide a detailed comparison of conditions at the site against the appropriate closure objectives and closure criteria. With each performance assessment report, there may be an opportunity to revise the security estimate depending on the stage of the operation and the current ICRP.

The anticipated timelines for preparation and submission to NWB of the above described reports are as follows:

- **Annual Closure and Reclamation Plan Progress Report:** Annually during Operations.
- **Reclamation Completion Report:** Upon completion of the Active and Passive Closure components (such as decommissioning and reclaiming mine buildings and infrastructure, commencement of passive pit flooding, etc.).

- **Performance Assessment Report:** Performance assessment reports will be prepared a maximum of five years following the completion of the closure effort and will recur a maximum of every five years until ultimate closure conditions have been met. Performance assessment reporting will be used to determine at what time the effluent quality is of a suitable quality for discharge without the respective management measures (where applicable).

6. Schedule of Closure and Reclamation Activities

Sabina requests a term of at least one year to allow for construction of some basic infrastructure site preparation during the mobilization and development phase of the Project. Sabina is requesting the term of licence expiry be set “upon issuance of the Type A”. Sabina is requesting that, should a Type A Water Licence be issued for the Project in the future, that the Board incorporate the scope of this Type B Application/Licence into the Type A Water Licence.

Similar to the Term of Licence, Sabina also requests that, should a Type A Water Licence be issued for the Project in the future, that the Board incorporate the security required under the Development Type B Licence into the Type A Water Licence such that a “double bonding” for project activities of the same scope does not occur.

Sabina estimates that, if the Type A Licence was not issued, it would require one summer season to complete the closure site work noted in this plan. The equipment and material from Goose Camp would then have to be de-mobilized over the winter ice road to the MLA during the following winter for shipment at the start of the following summer shipping season. Sabina anticipates the Type A Water Licence will be issued, so this plan would not need to be implemented.

7. Estimate of Proposed Development Works Financial Liability

A permanent closure and reclamation financial security cost estimate for the proposed development works described in this plan has been prepared to a conceptual level using RECLAIM Version 7.0, March 2014 (Attachment A).

A summary of the financial security cost estimate for the pre-development works is provided in Table 7.1.

Table 7.1. Summary of the Financial Security Cost Estimate

CAPITAL COSTS	COMPONENT NAME	COST	LAND LIABILITY	WATER LIABILITY
QUARRY	Airstrip Quarry Expansion	$3,800	$0	$3,800
QUARRY	Umwelt Quarry	$18,763	$0	$18,763
QUARRY	MLA Quarry	$9,500	$0	$9,500
UNDERGROUND MINE		$0	$0	$0
TAILINGS FACILITY		$0	$0	$0
ROCK PILE		$0	$0	$0
BUILDINGS AND EQUIPMENT		$655,311	$0	$655,311
CHEMICALS AND CONTAMINATED SOIL MANAGEMENT		$222,750	$0	$222,750
SURFACE AND GROUNDWATER MANAGEMENT		$0	-	$0
INTERIM CARE AND MAINTENANCE		$0	-	$0
	SUBTOTAL: Capital Costs	**$910,124**	**$0**	**$910,124**
	PERCENT OF SUBTOTAL		**0%**	**100%**
INDIRECT COSTS		**COST**	**LAND LIABILITY**	**WATER LIABILITY**
MOBILIZATION/DEMOBILIZATION		$227,729	$0	$227,729
POST-CLOSURE MONITORING AND MAINTENANCE		$56,572	$0	$56,572
ENGINEERING	5%	$45,506	$0	$45,506
PROJECT MANAGEMENT	5%	$45,506	$0	$45,506
HEALTH AND SAFETY PLANS/MONITORING & QA/QC	1%	$9,101	$0	$9,101
BONDING/INSURANCE	1%	$9,101	$0	$9,101
CONTINGENCY	10%	$91,012	$0	$91,012
MARKET PRICE FACTOR ADJUSTMENT	0%	$0	$0	$0
	SUBTOTAL: Indirect Costs	**$484,529**	**$0**	**$484,529**
TOTAL COSTS		**$1,394,653**	**$0**	**$1,394,653**

8. References

CCME (Canadian Council of Ministers of the Environment) 2003. Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products

DFO (Fisheries and Oceans Canada) 2013. Measures to Avoid Causing Harm to Fish and Fish Habitat, http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html

Government of Northwest Territories (GNWT) 2015. Northern Land Use Guidelines

NIRB (Nunavut Impact Review Board). 2017. Revised Final Hearing Report Back River Gold Mine Project. NIRB File No. 12MN036. July 2017.

Transport Canada. 2015. Aerodromes Standards and Recommended Practices (TP 312) 5th Edition. Revised July 2015.

Attachment A: Security Estimate - Reclaim Model v.7.0 – Back River Project Type B Water Licence for Development Works

SUMMARY OF COSTS

CAPITAL COSTS	COMPONENT NAME	COST	LAND LIABILITY	WATER LIABILITY
QUARRY	Airstrip Quarry Expansior	$3,800	$0	$3,800
QUARRY	Umwelt Quarry	$18,763	$0	$18,763
QUARRY	MLA Quarry	$9,500	$0	$9,500
UNDERGROUND MINE		$0	$0	$0
TAILINGS FACILITY		$0	$0	$0
ROCK PILE		$0	$0	$0
BUILDINGS AND EQUIPMENT		$655,311	$0	$655,311
CHEMICALS AND CONTAMINATED SOIL MANAGEMENT		$222,750	$0	$222,750
SURFACE AND GROUNDWATER MANAGEMENT		$0	-	$0
INTERIM CARE AND MAINTENANCE		$0	-	$0
	SUBTOTAL: Capital Costs	**$910,124**	**$0**	**$910,124**
	PERCENT OF SUBTOTAL		**0%**	**100%**

INDIRECT COSTS		COST	LAND LIABILITY	WATER LIABILITY
MOBILIZATION/DEMOBILIZATION		$227,729	$0	$227,729
POST-CLOSURE MONITORING AND MAINTENANCE		$56,572	$0	$56,572
ENGINEERING	5%	$45,506	$0	$45,506
PROJECT MANAGEMENT	5%	$45,506	$0	$45,506
HEALTH AND SAFETY PLANS/MONITORING & QA/QC	1%	$9,101	$0	$9,101
BONDING/INSURANCE	1%	$9,101	$0	$9,101
CONTINGENCY	10%	$91,012	$0	$91,012
MARKET PRICE FACTOR ADJUSTMENT	0%	$0	$0	$0
	SUBTOTAL: Indirect Costs	**$484,529**	**$0**	**$484,529**

TOTAL COSTS	**$1,394,653**	**$0**	**$1,394,653**

3 **Quarry Name:** **Airstrip Quarry Expansion** **Pit # 1**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
CONTROL ACCESS									
Fence		m		#N/A	$0.00	$0		$0	$0
Signs		each		#N/A	$0.00	$0		$0	$0
Berm at crest		m3		#N/A	$0.00	$0		$0	$0
Block roads		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
STABILITY STUDY									
Conduct stability and setback study		allow		#N/A	$0.00	$0		$0	$0
STABILIZE SLOPES									
Off-load crest, soil A		m3		#N/A	$0.00	$0		$0	$0
Off-load crest, soil B		m3		#N/A	$0.00	$0		$0	$0
Doze/trim overburden at crest		m3		#N/A	$0.00	$0		$0	$0
Drill & blast pit crest		m3		#N/A	$0.00	$0		$0	$0
Buttress slope		m3		#N/A	$0.00	$0		$0	$0
Other	Backhoe to pull down loose rock on bedrock backslope - assumed	hrs	20	exc-sL	$190.00	$3,800		$0	$3,800
COVER/CONTOUR SLOPES									
Place fill, soil A		m3		#N/A	$0.00	$0		$0	$0
Place fill, soil B		m3		#N/A	$0.00	$0		$0	$0
Rip rap		m3		#N/A	$0.00	$0		$0	$0
Vegetate slopes	Allow to revegetate naturally	ha		#N/A	$0.00	$0		$0	$0
Vegetate pit floor		ha		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
CONSTRUCT DIVERSION DITCHES									
Excavate ditches -soil		m3		#N/A	$0.00	$0		$0	$0
Excavate ditches -rock		m3		#N/A	$0.00	$0		$0	$0
Rip rap in channel base		m3		#N/A	$0.00	$0		$0	$0
CONSTRUCT SPILLWAY									
Excavate channel		m3		#N/A	$0.00	$0		$0	$0
Concrete		m3		#N/A	$0.00	$0		$0	$0
Rip rap		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
RECLAIM QUARRIES									
Contour slopes		m3		#N/A	$0.00	$0		$0	$0
Place overburden		m3		#N/A	$0.00	$0		$0	$0
Vegetate		m3		#N/A	$0.00	$0		$0	$0
FLOOD PIT-Capital	Quarry will not be flooded - development will occur below water level and the areas will be contoured to drain positively								
Remove stationary equipment (sump pumps)		each		#N/A	$0.00	$0		$0	$0
Remove dewatering pipeline		m		#N/A	$0.00	$0		$0	$0
Remove power lines		each		#N/A	$0.00	$0		$0	$0
Construct diversion ditches		m3		#N/A	$0.00	$0		$0	$0
-Ditch, mat'l A		m3		#N/A	$0.00	$0		$0	$0
-Ditch, mat'l B		m3		#N/A	$0.00	$0		$0	$0
Construct embankment/dam		m3		#N/A	$0.00	$0		$0	$0
Supply/install pump station		each		#N/A	$0.00	$0		$0	$0
Supply/install piping system		m		#N/A	$0.00	$0		$0	$0
Remove pump post-closure		each		#N/A	$0.00	$0		$0	$0
Remove pipeline post-closure		m		#N/A	$0.00	$0		$0	$0
FLOOD PIT-Annual Cost									
Operate pumps (power)		m3		#N/A	$0.00	$0		$0	$0
Maintain pump/pipeline		allow		#N/A	$0.00	$0		$0	$0
Labour:fuel management, commissioning/decom		$/h		#N/A	$0.00	$0		$0	$0
Chemical addition, _____ kg/m3 of water		tonne		#N/A	$0.00	$0		$0	$0
Chemicals, purchase and shipping		tonne		#N/A	$0.00	$0		$0	$0
Passive/biological additives		$/ha		#N/A	$0.00	$0		$0	$0
Passive additives purchase and shipping		tonne		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
					Annual pumping costs	$0			
Number of years of pump flooding		years							
					Total pumping costs	$0		$0	$0
					Total	$3,800		$0	$3,800
					% of Total			0%	100%

Quarry Name: **Umwelt Quarry** **Pit # 2**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
CONTROL ACCESS									
Fence		m		#N/A	$0.00	$0		$0	$0
Signs	Assumed	each	4	Sabina	$75.00	$300		$0	$300
Berm at crest	Estimated for continuous berm with 1m diameter boulders, no spacing between boulders - 0.52 m3/m	m3	484	RB1H	$17.05	$8,245		$0	$8,245
Block roads	2 entrances, each block 5m base, 1 m crest width, 1 m high, 2H:1V slopes and 20 m long	m3	120	RB1L	$11.40	$1,368		$0	$1,368
Other				#N/A	$0.00	$0		$0	$0
STABILITY STUDY									
Conduct stability and setback study		allow		#N/A	$0.00	$0		$0	$0
STABILIZE SLOPES									
Off-load crest, soil A		m3		#N/A	$0.00	$0		$0	$0
Off-load crest, soil B		m3		#N/A	$0.00	$0		$0	$0
Doze/trim overburden at crest		m3		#N/A	$0.00	$0		$0	$0
Drill & blast pit crest		m3		#N/A	$0.00	$0		$0	$0
Buttress slope		m3		#N/A	$0.00	$0		$0	$0
Other	Backhoe to pull down loose rock on bedrock backslope - assumed	hrs	15	exc-sL	$190.00	$2,850		$0	$2,850
COVER/CONTOUR SLOPES									
Place fill, soil A		m3		#N/A	$0.00	$0		$0	$0
Place fill, soil B		m3		#N/A	$0.00	$0		$0	$0
Rip rap		m3		#N/A	$0.00	$0		$0	$0
Vegetate slopes	Exposed Areas - allow to revegetate naturally	ha		#N/A	$0.00	$0		$0	$0
Vegetate pit floor		ha		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
CONSTRUCT DIVERSION DITCHES									
Excavate ditches -soil		m3		#N/A	$0.00	$0		$0	$0
Excavate ditches -rock		m3		#N/A	$0.00	$0		$0	$0
Rip rap in channel base		m3		#N/A	$0.00	$0		$0	$0
CONSTRUCT SPILLWAY									
Excavate channel	Assumed - construction of two outflow systems (one at each location - two c	allow	1	Sabina	$6,000.00	$6,000		$0	$6,000
Concrete		m3		#N/A	$0.00	$0		$0	$0
Rip rap		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
RECLAIM QUARRIES									
Contour slopes		m3		#N/A	$0.00	$0		$0	$0
Place overburden		m3		#N/A	$0.00	$0		$0	$0
Vegetate		m3		#N/A	$0.00	$0		$0	$0
FLOOD PIT-Capital	Quarries will be allowed to pond naturally								
Remove stationary equipment (sump pumps)		each		#N/A	$0.00	$0		$0	$0
Remove dewatering pipeline		m		#N/A	$0.00	$0		$0	$0
Remove power lines		each		#N/A	$0.00	$0		$0	$0
Construct diversion ditches		m3		#N/A	$0.00	$0		$0	$0
-Ditch, mat'l A		m3		#N/A	$0.00	$0		$0	$0
-Ditch, mat'l B		m3		#N/A	$0.00	$0		$0	$0
Construct embankment/dam		m3		#N/A	$0.00	$0		$0	$0
Supply/install pump station		each		#N/A	$0.00	$0		$0	$0
Supply/install piping system		m		#N/A	$0.00	$0		$0	$0
Remove pump post-closure		each		#N/A	$0.00	$0		$0	$0
Remove pipeline post-closure		m		#N/A	$0.00	$0		$0	$0
FLOOD PIT-Annual Cost									
Operate pumps (power)		m3		#N/A	$0.00	$0		$0	$0
Maintain pump/pipeline		allow		#N/A	$0.00	$0		$0	$0
Labour:fuel management, commissioning/decom		$/h		#N/A	$0.00	$0		$0	$0
Chemical addition, _____ kg/m3 of water		tonne		#N/A	$0.00	$0		$0	$0
Chemicals, purchase and shipping		tonne		#N/A	$0.00	$0		$0	$0
Passive/biological additives		$/ha		#N/A	$0.00	$0		$0	$0
Passive additives purchase and shipping		tonne		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
					Annual pumping costs	$0			
Number of years of pump flooding		years							
					Total pumping costs	$0		$0	$0
					Total	$18,763		$0	$18,763
					% of Total			0%	100%

Quarry Name: **MLA Quarry** **Pit # 3**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	% Cost Land	Land Cost	Water Cost
CONTROL ACCESS								
Fence		m		#N/A	$0.00	$0	$0	$0
Signs		each		#N/A	$0.00	$0	$0	$0
Berm at crest		m3		#N/A	$0.00	$0	$0	$0
Block roads		m3		#N/A	$0.00	$0	$0	$0
Other				#N/A	$0.00	$0	$0	$0
STABILITY STUDY								
Conduct stability and setback study		allow		#N/A	$0.00	$0	$0	$0
STABILIZE SLOPES								
Off-load crest, soil A		m3		#N/A	$0.00	$0	$0	$0
Off-load crest, soil B		m3		#N/A	$0.00	$0	$0	$0
Doze/trim overburden at crest		m3		#N/A	$0.00	$0	$0	$0
Drill & blast pit crest		m3		#N/A	$0.00	$0	$0	$0
Buttress slope		m3		#N/A	$0.00	$0	$0	$0
Other	Backhoe to pull down loose rock on bedrock backslope - assumed	hrs	50	exc-sL	#####	$9,500	$0	$9,500
COVER/CONTOUR SLOPES								
Place fill, soil A		m3		#N/A	$0.00	$0	$0	$0
Place fill, soil B		m3		#N/A	$0.00	$0	$0	$0
Rip rap		m3		#N/A	$0.00	$0	$0	$0
Vegetate slopes	Allow to revegetate naturally	ha		#N/A	$0.00	$0	$0	$0
Vegetate pit floor		ha		#N/A	$0.00	$0	$0	$0
Other				#N/A	$0.00	$0	$0	$0
CONSTRUCT DIVERSION DITCHES								
Excavate ditches -soil		m3		#N/A	$0.00	$0	$0	$0
Excavate ditches -rock		m3		#N/A	$0.00	$0	$0	$0
Rip rap in channel base		m3		#N/A	$0.00	$0	$0	$0
CONSTRUCT SPILLWAY								
Excavate channel		m3		#N/A	$0.00	$0	$0	$0
Concrete		m3		#N/A	$0.00	$0	$0	$0
Rip rap		m3		#N/A	$0.00	$0	$0	$0
Other				#N/A	$0.00	$0	$0	$0
RECLAIM QUARRIES								
Contour slopes		m3		#N/A	$0.00	$0	$0	$0
Place overburden		m3		#N/A	$0.00	$0	$0	$0
Vegetate		m3		#N/A	$0.00	$0	$0	$0
FLOOD PIT-Capital	Quarry will not be flooded - development will occur below water level and the areas will be contoured to drain positively							
Remove stationary equipment (sump pumps)		each		#N/A	$0.00	$0	$0	$0
Remove dewatering pipeline		m		#N/A	$0.00	$0	$0	$0
Remove power lines		each		#N/A	$0.00	$0	$0	$0
Construct diversion ditches		m3		#N/A	$0.00	$0	$0	$0
-Ditch, mat'l A		m3		#N/A	$0.00	$0	$0	$0
-Ditch, mat'l B		m3		#N/A	$0.00	$0	$0	$0
Construct embankment/dam		m3		#N/A	$0.00	$0	$0	$0
Supply/install pump station		each		#N/A	$0.00	$0	$0	$0
Supply/install piping system		m		#N/A	$0.00	$0	$0	$0
Remove pump post-closure		each		#N/A	$0.00	$0	$0	$0
Remove pipeline post-closure		m		#N/A	$0.00	$0	$0	$0
FLOOD PIT-Annual Cost								
Operate pumps (power)		m3		#N/A	$0.00	$0	$0	$0
Maintain pump/pipeline		allow		#N/A	$0.00	$0	$0	$0
Labour:fuel management, commissioning/decom		$/h		#N/A	$0.00	$0	$0	$0
Chemical addition, _____ kg/m3 of water		tonne		#N/A	$0.00	$0	$0	$0
Chemicals, purchase and shipping		tonne		#N/A	$0.00	$0	$0	$0
Passive/biological additives		$/ha		#N/A	$0.00	$0	$0	$0
Passive additives purchase and shipping		tonne		#N/A	$0.00	$0	$0	$0
Other				#N/A	$0.00	$0	$0	$0
				Annual pumping costs		$0		
Number of years of pump flooding		years						
				Total pumping costs		$0	$0	$0
					Total	$9,500	$0	$9,500
					% of Total		0%	100%

1 **Building / Equip Name:** **Bldg / Equip #: 1**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
DISPOSE MOBILE EQUIPMENT									
Decontaminate prior to shipment off-site		allow	1	Sabina	$20,000.00	$20,000		$0	$20,000
Decontaminate and dispose on-site		allow		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
REMOVE BUILDINGS - see note below									
	Existing Goose camp configuration under existing Type B water license 2BE-GOO1520								
	Only MLA camp upgrade (25 person addition) included - existing camp			BRS1L					
Accomodation Complex	configuration under existing Type water license 2BE-GEO1520	m2	2,200		$45.00	$99,000		$0	$99,000
Process Facilities		m2		#N/A	$0.00	$0		$0	$0
Offices, Repair, Lab, Warehouse		m2		#N/A	$0.00	$0		$0	$0
	Goose relocated Explosive Storage Area - not included as removal is								
Storage Facilites	under 2BE-GOO1520	m2	-	#N/A	$0.00	$0		$0	$0
Water and Wastewater Treatment Facilities		m2		#N/A	$0.00	$0		$0	$0
U/G Heating Plant		m2		#N/A	$0.00	$0		$0	$0
Emulsion Plant		m2		#N/A	$0.00	$0		$0	$0
AN Storage Facility		m2		#N/A	$0.00	$0		$0	$0
Warehouse, Shops and Other		m2		#N/A	$0.00	$0		$0	$0
Storage Facility at Laydown/Airstrip		m2		#N/A	$0.00	$0		$0	$0
Temporary Fuel tanks - 9 x 70,000L in Insta-berms	Decommission MLA temporary fuel storage tanks and Insta-berms	allow	1	Sabina	$5,000.00	$5,000		$0	$5,000
REMOVE BULK FUEL STORAGE FACILITIES	15 ML welded steel tanks - 2 tanks - 1 each at Goose and MLA								
Empty and purge tank		manhour	64	lab-sH	$49.60	$3,174		$0	$3,174
Cut tank into 3m x 3m strips	Torch cutting 3 men crew @ 136 hours each tank	manhour	816	lab-sH	$49.60	$40,474		$0	$40,474
	Flatdeck truck with HIAB - strips hauling from Goose to MLA is covered								
Lower strips, haul and load on barge	under Mobilization tab	hr	400	hiab	$155.00	$62,000		$0	$62,000
HC contaminated soils	Remove for offsite disposal	m3	0	CSR	47	$0.00		0%	$0
Remove liner for offsite disposal	Cut tanks into 5 m strips x 50 m and rol	manhour	300	lab-sH	$49.60	$14,880		$0	$14,880
	Roll strips, haul to barge	hr	150	hiab	$155.00	$23,250		$0	$23,250
Decommission MLA and Goose fuel storage safety berms		m3	5160	DSL	$0.95	$4,902		$0	$4,902
Goose and MLA freshwater intakes	Pipes will be cut above water level and capped and left in place	m2		#N/A	$0.00	$0		$0	$0
Reclaim pumps at Goose and MLA freshwater intakes	including exposed pipes (abover water level)	allow	1	Sabina	$5,000.00	$5,000		$0	$5,000
Outfall & Diffuser	@ MLA - pipe will be cut above water level and capped and left in place	m2		#N/A	$0.00	$0		$0	$0
Airstrip lighting, navigation, electrician		mandays		#N/A	$0.00	$0		$0	$0
Airstrip lighting, navigation, mechanical		mandays		#N/A	$0.00	$0		$0	$0
Break foundation slabs	total of all buildings	m2		#N/A	$0.00	$0		$0	$0
Consolidate & dump boneyard debris		m3		#N/A	$0.00	$0		$0	$0
	Restore stream - it includes decommissioning of the migratory fishway								
Rascal Stream re-alignment	and fish barriers, and breaching of the diversion berm	allow	1	Sabina	$20,000.00	$20,000		$0	$20,000
Lighter barge terminal		allow	1	Sabina	$10,000.00	$10,000		$0	$10,000
Other				#N/A	$0.00	$0		$0	$0
LANDFILL FOR DEMOLITION WASTE									
Place rock cover		m3		#N/A	$0.00	$0		$0	$0
Place soil cover		m3		#N/A	$0.00	$0		$0	$0
Vegetate		ha		#N/A	$0.00	$0		$0	$0
GRADE AND CONTOUR PADS									
	Existing Goose camp configuration under existing Type B water license 2BE-GOO1520		0.2	SCFYL					
	Only MLA camp upgrade included - existing camp configuration under								
Accomodation Complex	existing Type water license 2BE-GEO1520	ha			$4,300.00	$946		$0	$946
Process Facilities	Scarify Goose plant site and Goose fuel storage pad initial construction	ha	54.3	SCFYL	$4,300.00	$233,490		$0	$233,490
Offices, Repair, Lab, Warehouse		ha		#N/A	$0.00	$0		$0	$0
	Scarify Goose relocated Explosive Storage Area - assumed 3 sea cans			SCFYL					
Storage Facilites	at 50 m2 each.	ha	0.05		$4,300.00	$194		$0	$194
Water and Wastewater Treatment Facilities		ha		#N/A	$0.00	$0		$0	$0
U/G Heating Plant		ha		#N/A	$0.00	$0		$0	$0
Emulsion Plant		ha		#N/A	$0.00	$0		$0	$0
Warehouse, Shops and Other		ha		#N/A	$0.00	$0		$0	$0
Place rock cover		m3		#N/A	$0.00	$0		$0	$0
Vegetate	Allow to revegetate naturally	ha		#N/A	$0.00	$0		$0	$0
Other	Scarify MLA temporary fuel storage pad - not required	ha		#N/A	$0.00	$0		$0	$0
Other	Scarify MLA storage pad (15 ML fuel tank)	ha	2.08	SCFYL	$4,300.00	$8,944		$0	$8,944
Other	Scarify Goose storage pad (15 ML fuel tank)	ha	2.08	SCFYL	$4,300.00	$8,944		$0	$8,944
PUNCTURE LINED SUMPS									
Puncture liner and place soil cover		m3		#N/A	$0.00	$0		$0	$0
RECLAIM ROADS									
Remove culverts	Goose - on site all-weather service roads; 5 culverts	allow	1	Sabina	$10,000.00	$10,000		$0	$10,000
Remove bridges		each		#N/A	$0.00	$0		$0	$0
Scarify roads	Goose - on site all-weather service roads - 8 m wide, 7.4 km	ha	5.92	SCFYH	$6,030.00	$35,698		$0	$35,698
Scarify roads	MLA - on site all-weather service roads - 8 m wide, 1 km	ha	0.8	SCFYH	$6,030.00	$4,824		$0	$4,824
Scarify and install water breaks		ha		#N/A	$0.00	$0		$0	$0
Scarify airstrip	Not applicable - MLA ice airstrip (on sea ice)	ha		#N/A	$0.00	$0		$0	$0
	Goose airstrip extension ((1,524 m total length - 914 m existing								
Scarify airstrip	length)*45 m wide)	ha	2.745	SCFYH	$6,030.00	$16,552		$0	$16,552
Scarify laydown areas	MLA laydown area initial construction	ha	4.65	SCFYH	$6,030.00	$28,040		$0	$28,040
Vegetate	Allow to revegetate naturally	ha		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
SPECIALIZED ITEMS									
Dispose of misc. debris and laydown area refuse				#N/A	$0.00	$0		$0	$0
					Total	$655,311		$0	$655,311
					% of Total			0%	100%

Note: Unit costs are based on 3m high, single storey building. Scale larger building areas accordingly. E.g. 10m high building multiply area by 3.3 (10/

1 **Chemicals/Soil Area Name:**

Note: The procedures, equipment and packaging for clean up and removal of chemicals or contaminated soils are highly dependent on the nature of the chemicals and their existing state of containment. Government guidelines should be consulted on an individual chemical basis. Any estimate made here should be considered very rough unless specific evaluations have been conducted.

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
HAZARDOUS MATERIALS AUDIT									
Hazardous materials audit		mandays		#N/A	$0.00	$0		$0	$0
Phase 1 audit	1 at Goose, 1 at MLA - half of cost under existing Type B	each	1.0	CS1L	$7,500.00	$7,500		$0	$7,500
Phase 2 audit	1 at Goose, 1 at MLA - half of cost under existing Type B	each	1.0	CS2L	$50,000.00	$50,000		$0	$50,000
BUILDING DECONTAMINATION & CONSOLIDATION OF HAZARDOUS MATERIALS									
Environmental technician/coordinator		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate: oil, fuel		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate maintenance shop		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate power plant		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate bulk fuel storage		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate ANFO plant		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate offices/warehouse/accom		mandays		#N/A	$0.00	$0		$0	$0
Removal of asbestos siding on buildings		m2		#N/A	$0.00	$0		$0	$0
Removal of friable asbestos on equipment		m2		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
HAZARDOUS MATERIALS REMOVAL									
Waste oils	To be burned in the camp incinerators, cost includes transportation - quantity assumed	litre	5000	ORL	$0.43	$2,150		$0	$2,150
Waste fuel	To be burned in the MLA incinerator, cost includes transportation - assumed 50% of fuel tanks volume (9 tanks of 70,000 L)	litre	315000	ORL	$0.43	$135,450		$0	$135,450
Waste batteries	Assumed 20-kg batteries - to be disposed off-site, includes transportation and disposal fees	kg	20	PCRH	$2.50	$50		$0	$50
Assay & environmental lab reagents		kg		#N/A	$0.00	$0		$0	$0
Machine shop paints, solvents etc		litre		#N/A	$0.00	$0		$0	$0
Glycol		litre		#N/A	$0.00	$0		$0	$0
Process reagents		kg		#N/A	$0.00	$0		$0	$0
Fuel Tanks	Remove hazardous waste (equipment under building & equip. cost)	allow	1	Sabina	$2,000.00	$2,000		$0	$2,000
Nuclear sources		allow		#N/A	$0.00	$0		$0	$0
Other hazardous materials	Unused materials included in waste costs above	allow		#N/A	$0.00	$0		$0	$0
HAZARDOUS MATERIALS									
Transportation to disposal facility	off-site	allow	1	Sabina	$10,000.00	$10,000		$0	$10,000
Disposal fees	off-site	allow	1	Sabina	$1,000.00	$1,000		$0	$1,000
Other				#N/A	$0.00	$0		$0	$0
CONTAMINATED SOILS									
Contam. soil investigation - Phase 1		each		#N/A	$0.00	$0		$0	$0
Contam. soil investigation - Phase 2		each		#N/A	$0.00	$0		$0	$0
CONTAMINATED SOIL REMOVAL									
Excavate and transport to onsite facility		m3		#N/A	$0.00	$0		$0	$0
Manage hydrocarbon remediation at facility		m3		#N/A	$0.00	$0		$0	$0
Reagents/stabilizing agent		m2		#N/A	$0.00	$0		$0	$0
Excavate and transport to offsite facility	Includes excavation, shipment off site and remediation fees	m3	100	CSRH	$146.00	$14,600		$0	$14,600
Contour decontaminated area		m3		#N/A	$0.00	$0		$0	$0
CONTAMINATED SOIL VERY LOW PERMEABILITY COVER									
Supply geomembrane, HDPE, ES3, GCL		m2		#N/A	$0.00	$0		$0	$0
Upper and lower bedding layers		m3		#N/A	$0.00	$0		$0	$0
Install geomembrane, HDPE, ES3, GCL		m2		#N/A	$0.00	$0		$0	$0
Erosion protection layer		m3		#N/A	$0.00	$0		$0	$0
Vegetate		m2		#N/A	$0.00	$0		$0	$0
Install infiltration/seepage instrumentation		allow		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
OTHER									
				#N/A	$0.00	$0		$0	$0
					Total	$222,750		$0	$222,750
					% of Total			0%	100%

1 **Mobilization/Demobilization:**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MOBILIZE HEAVY EQUIPMENT	Assumed Sabina equipment left at site and available for contractor's use. Equipment will be de mobilized from Goose to MLA, via 157 km ice winter road, once reclamation activities at Goose have been carried out.					
1 excavator	to be mobilized in CAT train - time in transit from Goose (1 equip) - hrs assumed	hrs	30	exc-sL	190	$5,700
1 dozer	to be mobilized in CAT train - time in transit from Goose (1 equip) - hrs assumed	hrs	30	dozersH	260	$7,800
2 light trucks	to be mobilized in CAT train - time in transit from Goose (2 trucks) - hrs assumed	hrs	60	Sabina	20	$1,200
1 CAT train	time in transit from Goose (1 equip) - hrs assumed	hrs	30	Sabina	500	$15,000
Personnel	3 staff - time in transit - hrs assumed	hrs	90	operH	65	$5,850
Dump trucks		each		#N/A	0	$0
Demolition shears		each		#N/A	0	$0
Crane		each		#N/A	0	$0
Loader		each		#N/A	0	$0
Compactor		each		#N/A	0	$0
MOBILIZE MISC. EQUIPMENT						
Pump shipping		each		#N/A	0	$0
Pipe shipping		m		#N/A	0	$0
Minor tools and equipment		allow		#N/A	0	$0
Truck tires		allow		#N/A	0	$0
Other				#N/A	0	$0
MOBILIZE CAMP						
Reclamation activities		allow		#N/A	0	$0
Long term reclamation activities (eg pump flooding)		allow		#N/A	0	$0
Food and Freight		kg	580	Sabina	12	$6,955
MOBILIZE WORKERS						
Reclamation activities - transport	Round trip to MLA	each	8	Sabina	572	$4,576
Reclamation activities - travel time	Round trip to MLA	mandays	16	Sabina	110	$1,760
Long term reclamation activities (eg pump flooding) - transport	Round trip to MLA	each	4	Sabina	572	$2,288
Long term reclamation activities (eg pump flooding) - travel time	Round trip to MLA	mandays	8	Sabina	110	$880
Monitoring Airfare		each		#N/A	0	$0
WORKER ACCOMMODATIONS						
Reclamation activities		mandays	168	Sabina	110	$18,480
Long term reclamation activities (eg pump flooding)		mandays	84	Sabina	110	$9,240
MOBILIZE FUEL						
Fuel freight - reclamation activities		litre		#N/A	0	$0
Fuel freight - long term reclamation activities		litre		#N/A	0	$0
Fuel freight accommodations		litre		#N/A	0	$0
WINTER ROAD						
Construction and operation	Assumes construction and maintenance of one time x 9 km winter ice roads at Goose. 157 km Winter Ice Road between MLA and Goose not included as it is covered by existing Type B licence	km	9	WRCL	2000	$18,000
Limited winter use		km		#N/A	0	$0
Winter road tariff		km		#N/A	0	$0
DEMOBILIZE HEAVY EQUIPMENT						
1 excavator, 1 dozer, 2 light trucks, CAT train	off - site : shipping allowance	allow	1	Sabina	10000	$10,000
Barge rental		allow	1	Sabina	60000	$60,000
Dump trucks		km		#N/A	0	$0
Demolition shears		km		#N/A	0	$0
Crane		km		#N/A	0	$0
Loader		km		#N/A	0	$0
Compactor		each		#N/A	0	$0
Demobilize waste from Goose to MLA	Cut up steel tank, shipping containers and other wastes	allow	1	Sabina	60000	$60,000
DEMOBILIZE CAMP						
		allow		#N/A	0	$0
DEMOBILIZE WORKERS						
crew travel time	included under Mobilize Workers above (round trip)	mandays		#N/A	0	$0
crew transportation	included under Mobilize Workers above (round trip)	each		#N/A	0	$0
					Total	**$227,729**

1 Post-Closure Monitoring & Maintenance:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MONITORING & INSPECTIONS						
Annual geotechnical inspection	allowance - to be combined with existing Type B licences	each	0.5	RPTH	$20,000.00	$10,000
Surface water sampling	allowance	each	0.5	WSH	$10,000.00	$5,000
Ground water sampling	not applicable	each	0	WSH	$10,000.00	$0
Receiving/downstream water sampling	allowance	each	0.5	WSH	$10,000.00	$5,000
Survey inspection		each		#N/A	$0.00	$0
Regulatory costs*		each		#N/A	$0.00	$0
Site water monitoring (AEMP and SNP)		each		#N/A	$0.00	$0
- Active closure and flooding		each		#N/A	$0.00	$0
- Post pit flooding		each		#N/A	$0.00	$0
Air Quality Monitoring Program (AQMP)		each		#N/A	$0.00	$0
Wildlife Effects Monitoring Program (WEMP)		each		#N/A	$0.00	$0
Vegetation Monitoring		each		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
COVER MAINTENANCE						
Repair erosion - infill gullies		allow		#N/A	$0.00	$0
Repair erosion - upgrade diversion ditches		allow		#N/A	$0.00	$0
Remove problem vegetation		allow		#N/A	$0.00	$0
Repair animal damage		allow		#N/A	$0.00	$0
Repair/upgrade access controls		allow		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
SPILLWAY MAINTENANCE						
Repair erosion		m3		#N/A	$0.00	$0
Clear spillway		each		#N/A	$0.00	$0
CWTS MAINTENANCE						
Maintain flow, restore vegetation		allow		#N/A	$0.00	$0
POST-CLOSURE WATER TREATMENT						
Annual water treatment cost, from "Water Treatment"						$0
Subtotal, Annual post-closure costs						$20,000
Discount rate for calculation of net present value of post-closure cost, %				3.00%		
Number of years of post-closure activity				3	years	
Present Value of payment stream						$56,572

*Regulatory costs - annual reporting, management plans, progress reports etc.